

The National Park Service Geologic Resources Evaluation Geology-GIS Coverage/Shapefile Data Model

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SUMMARY

Beginning in 1998, the National Park Service initiated a Geologic Resources Evaluation (GRE) to document and evaluate the geologic resources of about 273 National Park System units (national parks, monuments, recreational areas, historic sites, seashores, etc.). Applications, including the NPS-developed ArcView 3.X Theme Manager, graphical cross section viewer and legend text display tools are integrated with a standard geology-GIS model that is in development. The evolving geology-GIS model was initially based on the Washington State ArcInfo GIS Data Model (Harris 1998), <<http://pubs.usgs.gov/openfile/of98-487/harris.html>>, and includes components of the North American Geologic Map Data Model (NADM), <<http://geology.usgs.gov/dm/>>

INTRODUCTION

Bedrock and surficial geologic maps and supporting information provide the foundation for studies of groundwater, geomorphology, soils, and environmental hazards. Geologic maps describe the underlying physical habitat of many natural systems and are an integral component of the physical science inventories stipulated by the National Park Service (NPS) in its Natural Resources Inventory and Monitoring Guideline (NPS-75) and the 1997 NPS Strategic Plan.

The NPS Geologic Resources Evaluation (GRE) is a cooperative endeavor to implement a systematic, comprehensive inventory of the geologic resources in 273 park units with significant natural resources. Cooperators include the NPS Geologic Resources Division, NPS Inventory and Monitoring (I&M) Program (Natural Resource Information Division), U.S. Geological Survey (USGS) and many state geological surveys.

GEOLOGIC MAPPING AND DIGITIZING PROJECTS

The NPS GRE Program has cost-shared with the following state agencies: Utah Geological Survey new geologic field mapping for Zion National Park (NP) and Glen Canyon National Recreation Area (NRA); with the North Carolina Geological Survey for new mapping along Blue Ridge Parkway; with the Minnesota Geological Survey at Voyageurs NP; and with the South Carolina Geological Survey at Kings Mountain National Historic Park. Additional field mapping projects have been initiated or completed for the geologic maps for Bent's Old Fort National Historic Site (NHS), Curecanti NRA, Florissant Fossil Beds National Monument (NM), Great Sand Dunes NP, Capitol Reef NP, Cedar Breaks NM, Golden Spike NHS, and Natural Bridges NM.

The NPS Geologic Resources Evaluation is being actively developed with the formal cooperation of USGS and state geological surveys. However, many opportunities for project collaboration may exist that have not yet been identified, and effective communication among cooperators is a key factor for success of the inventory.

Another challenge of inventory planning is the development of digital map standards that are adaptable to diverse geological conditions but still provide quality, uniform products and firm guidance for map developers. Indeed, the diversity of geologic resources found in the National Park System will provide a continuing challenge for effective project management. The National Park Service has identified GIS and digital cartographic products as fundamental resource management tools, and the Inventory and Monitoring (I&M) Program and Geological Resources Division (GRD) are developing an efficient inventory program to expedite the acquisition of digital geologic information for NPS units throughout the country. The NPS is attempting to align these digital standards with those of the USGS and the developing National Geologic Map Data Model.

GIS ISSUES AND IMPLEMENTATION - MAKING GEOLOGY "USER -FRIENDLY"

One of the unresolved issues facing developers of digital geologic maps and geology-GIS models is how to include map unit descriptions, supplemental explanatory text (references and map notes), geologic cross sections, and the variety of other printed information that occur on published maps. This issue is particularly important to the National Park Service because there are few geologists employed at parks, and resource managers rarely have the GIS and geologic expertise needed to develop a useful product from digital layers of polygons, lines, points, and associated tabular data. The overarching development goal of the NPS I&M Program is to produce digital products that are immediately useful to anyone familiar with their analog counterparts. For geologic maps, this means that the map unit legend must be sorted and shaded appropriately by geologic age and that all textual, graphical, and other information from the published maps must be available interactively to the user. In short, the digital product must "look and feel" like its published source.

Since NPS resource managers use GIS as a tool in a wide array of collateral duties, the I&M Program is developing most digital products in ESRI (Environmental Systems Research Institute) ArcView 3.X GIS. ArcView 3.X interfaces effectively with other software running on the Microsoft Windows operating

system. Also, using a variety of tools, including the NPS Theme Manager, Windows help software, a Microsoft Visual Basic graphics viewer program, the ArcView 3.X legend editor, and the ArcView 3.X GIS functionality, has allowed query and automatic display of published map information in a digital GIS.

Automating Map Unit Descriptions and Other Textual Information

In most GIS applications, the spatial database structure does not facilitate the use of voluminous textual data. For example, in ArcView 3.X, the database text fields only accommodate 254 characters (320 for INFO tables) which limits the ability to include lengthy map descriptions with the spatial data. Several options are available in ArcView 3.X to overcome this limitation including concatenating database fields, independent text files, linking to other database system files, and linking to a Microsoft Windows help file. After testing several options, NPS developers have been implementing the Windows help system.

This approach begins with the creation of the Help file table of contents (object table). The table includes a title, a listing of all source map units (sorted by geologic age), and a list of source map references and notes. Text descriptions of map units, paginated by geologic age, are entered next. For compiled geologic maps, maps produced from more than one source map, a unit's description often consists of multiple map unit descriptions. At the end, the source map references and notes text, also one per page, were entered. Help context IDs (HELP_ID), topic names, keywords, page numbers, and linking codes were then added to the footnotes of each page. The data was then saved as a rich text format (.rtf) file, and compiled into a Windows help (.hlp) file.

Once compiled, the Windows help file can be opened and used with almost any Microsoft Windows software. The table of contents has each map unit symbol and unit name "hot-linked" to the descriptions, and each description is hot-linked to the references and notes. Using the built-in Windows help tools, users can jump instantly to the table of contents, page through the age-sorted unit descriptions, search for keywords, or index the file and perform full-text searches of the entire file. The Black Canyon/Curecanti pilot project help file consists of more than 50 printed pages of information for more than 130 map units. Advantages of the Windows help file are that most text formatting, such as font, size, color, etc., are preserved in the final product, many graphics and tables are also supported, and the help system can be developed somewhat independently of the digital geologic map.

Using the NPS Theme Manager extension in ArcView 3.X allows for the use of a toolbar button to automate the Windows help file and call unit descriptions interactively from the geologic map. The button tool is only active when the geology coverage/theme is turned on. The user selects the map unit help tool from the ArcView 3.X toolbar and clicks on the desired map unit to view the associated unit description. Using the map unit symbol (GLG_SYM, see NPS GRE Geology-GIS Coverage/Shapefile Data Model below) and the corresponding help context ID (HELP_ID), the Theme Manager loads the Windows help file and pages to the map unit description. Thus, the map unit descriptions and other text are interactively available to the user of the digital map.

Automating the Geologic Cross Sections

Geologic cross sections are integral components of many published geologic maps and provide important spatial visualization tools to assist users with understanding the mapped geology. The cross sections are scanned and annotated digital graphics files (JPEG format) that ArcView 3.X, using the NPS Theme Manager extension, can load and display. The button tool is only active when the cross section coverage/theme is active or turned on. This allows the user to interactively select the cross section(s) to view. The viewer displays the graphics at 100% with the ability to scroll from one end of the section to

the other. With projects such as the Black Canyon/Curecanti pilot, the ability to quickly view some 28 cross sections throughout the area is a powerful asset toward understanding the area's geology.

To prepare the cross sections for viewing, the graphics are first scanned at 150 dots-per-inch (DPI) and saved as a digital JPEG (.jpg extension) graphics file. The images are then annotated with text to indicate cross section line (e.g. A-A') and map source. The JPEG format was chosen to allow the graphics to be served and viewed over the Internet in the future. Once again, the 8.3 file naming convention is used to facilitate sharing across all platforms, and file names are based on the map series designation and the designated cross section on the map (e.g., "gq1516a.jpg" is the A-A' cross section on the Geologic Quadrangle Map GQ-1516).

GIS Map Unit Legend

In ArcView 3.X, theme legends can be customized to reproduce map feature symbols and colors of published source maps. To represent map features of a particular theme, an attribute field is selected in that theme's legend editor that relates map feature type with legend symbol type and color. In the NPS GRE Geology-GIS Coverage/Shapefile Data Model (presented below), the attribute field that denotes map feature type is typically either COV_TYPE for point coverages/themes or COV_LT for line coverages/themes, where COV represents the theme/coverage abbreviation. For polygon coverages/themes (themes typically representing geologic map units of areal extent), and also for point and line coverages/themes that represent point and line geologic map units, respectively, GLG_AGE_NO is the attribute field that relates feature type with symbol type (pattern) and color. As mentioned in the data dictionary section of the paper, the GLG_AGE_NO is a numeric attribute field also used to sort map units by geologic time.

For point symbols that indicate or represent directionality, ArcView 3.X also allows for those symbols to be aligned to their correct orientation using a second attribute or rotation field. For attitude observation points, (e.g. strike and dip of bedding, trend and plunge of inclusions), which is the only coverage presently in the data model that has oriented point symbols, the ATD_AV_ROT field designates the desired symbol rotation value.

When a theme legend is completed, it can be saved as an ArcView 3.X legend file (.avl extension). In the data model, a legend file is named as per the theme/coverage file name. By default in ArcView 3.X, if a legend file exists with the same file name as a theme, the legend file is automatically loaded when that coverage/theme is added to a view.

NPS GRE GEOLOGY-GIS COVERAGE/SHAPEFILE DATA MODEL

As mentioned above, a standard geology-GIS data model has been developed for the National Park Service Geologic Resources Evaluation (GRE). The model is based on ArcInfo and integrates with user-friendly ArcView 3.X and ArcGIS 8.X + GIS software. As per ArcView 3.X and dBase requirements, database field names have been limited to ten characters or less. In addition, although many modern operating systems allow for long file names, theme/coverage file names within the model adhere to the 8.3 file name convention. Typically, themes/coverages and associated table file names are seven characters in length. The use of only seven characters allows for an additional character to be appended to a coverage name for related look-up tables. For an NPS unit digital geologic map, the first four characters or prefix of a coverage name (CODE) are the NPS unit's alpha code (e.g. ARCH is the NPS alpha code for Arches National Park). The next three characters (suffix) abbreviate the type of geologic coverage (COV). For digital maps that are not complete NPS unit maps a similarly derived and unique four-letter alpha code (CODE) is used. For INFO look-up tables associated with a coverage, an additional

or eighth character, typically an integer, is appended to the theme/coverage name. An exception to the file naming convention presented above is arc/line map features of a polygon coverage. ArcInfo coverages allow for both polygon and arc/line features (with attribution) to exist within the one (polygon and line) coverage, however, shapefiles (both ArcView 3.X and ArcGIS) do not. Thus two shapefiles (themes) are needed to present both the polygon and arc/line features with associated attribution. For a shapefile arc/line theme of a “polygon” coverage, an 'A' (arc) is appended to the seven character polygon file name.

As with any digital map model, alterations and additional components, many derived from unique or uncommon map components, continue to advance and expand the data model.

Geologic Themes

The NPS geology-GIS model's data themes or coverages are listed below.

Theme	Theme Type	Theme Description
CODEGLG/ CODEGLGA	poly/ line	Area spatial data consisting of geologic unit data and linear data (contacts) describing the interface between those units.
CODEGLN	line	Map units or geological spatial data represented as lines due to map scale limitations.
CODEGPT	point	Map units or geological spatial data represented as points due to map scale limitations.
CODEFLT	line	Linear faults.
CODEFLD	line	Linear fold axes/hingelines.
CODEATD	point	Attitude observation points.
CODEDAT	point	Age-date sample location points (fossil or radiometric age estimates).
CODEVNT	point	Volcanic vents, eruptive centers, features mapped as point features.
CODEVLN	line	Linear volcanic crater, eruptive and flow features.
CODEDK	line	Individual lithologic dikes mapped as linear features.
CODEDKS CODEDKSA	poly/ line	Area spatial data consisting of lithologic dikes too numerous to map as individual segments and linear data (contacts) describing the interface between those features and other adjacent features.
CODEMIN	point	Mine and mining related features.
CODESEC	line	Cross section lines.
CODEASH/ CODEASHA	poly/ line	Area spatial data consisting of volcanic ash and flow unit data and linear data (contacts) describing the interface between those units and other adjacent features.
CODEMET	line	Metamorphic grade boundaries.
CODEMOR	line	Linear glacial moraine features.
CODEJLN	line	Linear joint features.
CODELN#	line	Contour and other line features.
CODESPF	point	Geologic point data deemed sensitive by NPS Unit.
CODEUPF	point	Unique ‘non-sensitive’ geologic point features.
CODESUR/ CODESURA	poly/ line	Area spatial data consisting of surficial geologic unit data and linear data (contacts) describing the interface between those units and other adjacent features.

CODEMUT	point	Measured unit thickness points.
CODEMAF	poly/	Area spatial data consisting of mine feature data and linear data describing the interface between those features and other adjacent features.
CODEMAFA	line	
CODESMC	point	Seismic data localities.
CODESAM	point	Sample localities.
CODEDEF	poly/	Area spatial data consisting of fault and deformation zone data and linear data (boundaries) describing the interface between those units and other adjacent features.
CODEDEFA	line	
CODEHZL	line	Linear hazard features.
CODEHZP	point	Hazard point features.
CODEAGF	poly	Area spatial data consisting of glacial features unit and linear data (contacts) describing the interface between those units and other adjacent features.
CODEAGFA	line	
CODEHZA	poly	Area spatial data consisting of hazard features and linear data (contacts) describing the interface between those units and other adjacent features.
CODEHZAA	line	
CODEMAA	poly	Area spatial data consisting of metamorphic alteration area features and linear data (contacts) describing the interface between those units and other adjacent features.
CODEMAAA	line	
CODEGFP	point	Glacial features mapped as point localities.

denotes a number assigned to theme/coverage name (i.e. CODELN1, CODELN2)

Theme/Coverage Data Dictionary

At present, all of the 32 coverages and 42 shapefile themes presented in the NPS GRE Geology-GIS Coverage/Shapefile Data Model have been evaluated and adapted into a coverage/theme data dictionary. Of note, each theme/coverage has several attribute fields that ArcInfo adds automatically to a coverage. For polygon and point coverages, AREA, PERIMETER, CODECOV# and CODECOV-ID are added to the coverages polygon attribute table (.pat). For arc/line coverages and polygon coverage arc/line attribution, FNODE#, TNODE#, LPOLY#, RPOLY#, CODECOV# and CODECOV-ID are added to the coverages arc attribute table (.aat). Two INFO look-up tables relating to map source information (CODEMAP) and additional lithology unit data (CODEGLG1) are also presented.

GEOLOGIC UNITS (CODEGLG)

Coverage consists of area geologic units.

SPATIAL THEME (FILENAME): Geologic Units (CODEGLG)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEGLG.PAT (ArcInfo), CODEGLG.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEGLG_*	B (Binary)	4	5	-
CODEGLG_ID*	B (Binary)	4	5	-
GLG_IDX	I (Integer)	6	6	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

GLG_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

GLG_SYM Age-lithology symbol/code of geologic unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of geologic unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 99 is typically assigned to water areas.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map

projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Water Areas: Non-intermittent areas of water, area rivers, lakes, ponds and reservoir, are to be captured in the CODEGLG coverage/theme. If however, the 'underlying' geologic unit or units can be visually discerned on the source map, then these areas are not to be captured in the CODEGLG coverage/theme. Intermittent bodies are not to be captured unless the 'underlying' geologic unit or units can not be visually discerned on the source map. Captured water areas are denoted in the GLG_SYM and USGS_SYM fields (see field descriptions above) with the text 'WATER', and a GLG_AGE_NO (see field description above) value of 99.

 - 2.) Deformation Zones: Areas mapped as deformation zones (e.g. fault or shear zones) are to be captured in the CODEDEF coverage/theme unless the lithology (geologic units) of the deformation zone are not indicated (i.e. a deformation zone is essentially mapped as a 'geologic unit'). If so, then the bounding arcs that comprise the deformation zone are captured only in the CODEGLG and the area (polygon) attributed as a 'deformation zone'. These areas are denoted in the GLG_SYM and USGS_SYM fields (see field descriptions above) with the text 'DEFORMATION ZONE', 'FAULTZONE' or 'SHEARZONE'. If the deformation zone is distinguished from the geologic units, then the bounding arcs that define the deformation zone are captured in the CODEDEF coverage/theme (and not in the CODEGLG coverage/theme).
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GEOLOGIC UNIT CONTACTS/MAP BOUNDARY (CODEGLG/CODEGLGA)

Coverage consists of geologic contact arcs and map boundary. See the area geologic units coverage (CODEGLG) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Geologic Map Unit Boundaries/Contacts (CODEGLG/ArcInfo), (CODEGLGA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEGLG.AAT (ArcInfo), CODEGLGA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEGLGA_*	B (Binary)	4	5	-
CODEGLGA_ID*	B (Binary)	4	5	-
GLGCNT_IDX	I (Integer)	6	6	-
GLGCNT_TYP	I (Integer)	2	2	-
FLTCNT	C (Character)	1	1	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

GLGCNT_IDX A unique sequential identification number for each contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

GLGCNT_TYPE A code value that designates the positional accuracy and/or concealment of a contact/map boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

GLGCNT_TYP Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried
9	gradational
10	quadrangle boundary

GLGCNT_TYP Code Value List (cont.)

11	extent/map boundary
12	water/shoreline
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial approximate
16	subaqueous (inferred)

FLTCNT Designates geologic contact arcs that are also fault or deformation zone boundary arcs. Contact arc segments that are also fault or deformation zone boundary arcs (FLTCNT = 'Y') are present in both the geologic unit (CODEGLG/CODEGLGA) and fault (CODEFLT) or deformation zone (CODEDEF) coverages/themes.

FLTCNT Code List

Y	Yes, the contact <u>is</u> also a fault or deformation zone boundary
N	No, the contact is <u>not</u> also a fault or deformation zone boundary

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

- 1.) Contact/Fault Arcs in Multiple Themes: Contact arcs that are also fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are present in both the geologic contact/boundaries (CODEGLG/CODEGLGA) and fault (CODEFLT) themes.
 - 2.) Contact/Fault Arc Directionality: Contact/fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.
-

LINEAR GEOLOGIC UNITS (CODEGLN)

Coverage consists of linear geologic units.

SPATIAL THEME (FILENAME): Linear Geologic Units (CODEGLN)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEGLN.PAT (ArcInfo), CODEGLN.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEGLN_*	B (Binary)	4	5	-
CODEGLN_ID*	B (Binary)	4	5	-
GLN_IDX	I (Integer)	6	6	-
GLNCNT_TYP	I (Integer)	2	2	-
FLTCNT	C (Character)	1	1	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

GLN_IDX A unique sequential identification number for each linear geologic unit feature. A linear geologic unit can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

GLNCNT_TYP A code value used to designate the positional accuracy and/or concealment of a linear geologic unit arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

GLNCNT_TYP Code Value List

- | | |
|---|----------------------|
| 1 | known or certain |
| 2 | approximate |
| 3 | concealed |
| 4 | queried |
| 5 | approximate, queried |
| 6 | concealed, queried |
| 7 | inferred location |

GLNCNT_TYP Code Value List (cont.)

8	inferred, queried
12	water/shoreline
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial
16	subaqueous (inferred)

FLTCNT Designates linear geologic unit arcs that are along fault or deformation zone boundary lines. Linear geologic unit arcs that are also faults or deformation zone boundary arcs (FLTCNT = 'Y') are present in both the linear geologic unit (CODEGLN) and fault (CODEFLT) or deformation zone (CODEDEF) coverages/themes.

FLTCNT Code List

Y	Yes, the linear geologic unit arc <u>is</u> also a fault arc or deformation zone boundary
N	No, the linear geologic unit arc is <u>not</u> also a fault arc or deformation zone boundary

GLG_SYM Age-lithology symbol/code of linear geologic unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of linear geologic unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each linear geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Linear Geologic Unit/Fault Arc Directionality: Linear geologic unit arcs that are along fault lines (FLTCNT = 'Y', see FLTCNT field description above) are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_).

The down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

POINT GEOLOGIC UNITS (CODEGPT)

Coverage consists of point geologic units.

SPATIAL THEME (FILENAME): Point Geologic Units (CODEGPT)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEGPT.PAT (ArcInfo), CODEGPT.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEGPT_*	B (Binary)	4	5	-
CODEGPT_ID*	B (Binary)	4	5	-
GPT_IDX	I (Integer)	6	6	-
GPTCNT_TYP	I (Integer)	2	2	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

GPT_IDX A unique sequential identification number for each point. The field values range from 1 to n, where n is the number of point features in the coverage/theme.

GPTCNT_TYP A code value used to designate the positional accuracy and/or concealment of a point geologic unit. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

GPTCNT_TYP Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred

GPTCNT_TYP Code Value List (cont.)

8 inferred, queried

GLG_SYM Age-lithology symbol/code of a point geologic unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of a point geologic unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

FAULTS (CODEFLT)

Coverage consists of geologic fault lines.

SPATIAL THEME (FILENAME): Geologic Faults (CODEFLT)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEFLT.AAT (ArcInfo), CODEFLT.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 16

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEFLT_*	B (Binary)	4	5	-
CODEFLT_ID*	B (Binary)	4	5	-
FLT_IDX	I (Integer)	6	6	-
FLT_SEG_N	I (Integer)	3	3	-
FLT_SEG_T	I (Integer)	2	2	-
FLT_TYPE	I (Integer)	2	2	-
FLT_LT	I (Integer)	4	4	-
FLTCNT	C (Character)	1	1	-
FLT_NM	C (Character)	60	60	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

FLT_IDX A unique sequential identification number for each fault. A fault can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of faults in the coverage/theme.

FLT_SEG_N A sequential number assigned to each arc segment of a fault. All arc segments of a fault must be continuous and have a common FLT_IDX number. Segment numbers are assigned starting at the 'starting end' of a fault, defined as the end arc of a fault where the right fault block moved downward relative to the left fault block condition (as per fault special coverage digitization requirements), if valid (see Special Coverage Guidelines below). A value of 1 is assigned to the 'starting' fault arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that fault. For faults where the down-thrown block can not be determined or is not applicable, either end of the fault will suffice for the 'starting' arc. A value of 0 may be assigned to all arcs if 'conditions' justify so.

FLT_SEG_T A code value that designates the positional accuracy and/or concealment of a fault arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

FLT_SEG_T Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried

FLT_TYPE A code value used to differentiate fault type, as determined by fault separation/offset and/or displacement. Refer to the geologic map legend for graphical representation of faults as well as the accompanying map notes and/or report on fault types. In addition, fault arcs that contact a map edge may have additional information pertinent to that fault on an adjacent geologic map.

FLT_TYPE Code Value List

1	thrust fault
2	reverse fault
3	low angle normal fault
4	normal fault
5	right-lateral strike-slip fault
6	left-lateral strike-slip fault
7	reverse right-lateral strike-slip fault
8	reverse left-lateral strike-slip fault
9	normal right-lateral strike-slip fault
10	normal left-lateral strike-slip fault
11	unknown offset/displacement
12	high-angle reverse fault
13	detachment fault/decollement
14	high angle fault
15	right-lateral fault, vertical displacement/offset unknown
16	left-lateral fault, vertical displacement/offset unknown
17	gravity slide plane
18	overturned thrust fault
19	high-angle right-lateral strike-slip fault
20	high-angle left-lateral strike-slip fault
21	overturned detachment fault/decollement
22	vertical fault
23	thrust right-lateral strike-slip fault
24	thrust left-lateral strike-slip fault
25	ductile fault
26	normal fault, horizontal displacement/offset unknown

FLT_LT A code value for graphical line type representation of a fault arc segment. The code value is derived from the segment type (FLT_SEG_T, see field description above) and fault type (FLT_TYPE, see field description above). The code value is calculated by multiplying the FLT_TYPE value by 10, then adding the FLT_SEG_T value to the sum.

FLT_LT Code Value List

11	thrust fault, known or certain
12	thrust fault, approximate
13	thrust fault, concealed
14	thrust fault, queried
15	thrust fault, approximate, queried
16	thrust fault, concealed, queried
17	thrust fault, inferred
18	thrust fault, inferred, queried
21	reverse fault, known or certain
22	reverse fault, approximate
23	reverse fault, concealed
24	reverse fault, queried
25	reverse fault, approximate, queried
26	reverse fault, concealed, queried
27	reverse fault, inferred
28	reverse fault, inferred, queried
31	low angle normal fault, known or certain
32	low angle normal fault, approximate
33	low angle normal fault, concealed
34	low angle normal fault, queried
35	low angle normal fault, approximate, queried
36	low angle normal fault, concealed, queried
37	low angle normal fault, inferred
38	low angle normal fault, inferred, queried
41	normal fault, known or certain
42	normal fault, approximate
43	normal fault, concealed
44	normal fault, queried
45	normal fault, approximate, queried
46	normal fault, concealed, queried
47	normal fault, inferred
48	normal fault, inferred, queried
51	right-lateral strike-slip fault, known or certain
52	right-lateral strike-slip fault, approximate
53	right-lateral strike-slip fault, concealed
54	right-lateral strike-slip fault, queried
55	right-lateral strike-slip fault, approximate, queried
56	right-lateral strike-slip fault, concealed, queried
57	right-lateral strike-slip fault, inferred
58	right-lateral strike-slip fault, inferred, queried
61	left-lateral strike-slip fault, known or certain
62	left-lateral strike-slip fault, approximate
63	left-lateral strike-slip fault, concealed
64	left-lateral strike-slip fault, queried
65	left-lateral strike-slip fault, approximate, queried
66	left-lateral strike-slip fault, concealed, queried
67	left-lateral strike-slip fault, inferred
68	left-lateral strike-slip fault, inferred, queried
71	reverse right-lateral strike-slip fault, known or certain
72	reverse right-lateral strike-slip fault, approximate

FLT_LT Code Value List (cont.)

73	reverse right-lateral strike-slip fault, concealed
74	reverse right-lateral strike-slip fault, queried
75	reverse right-lateral strike-slip fault, approximate, queried
76	reverse right-lateral strike-slip fault, concealed, queried
77	reverse right-lateral strike-slip fault, inferred
78	reverse right-lateral strike-slip fault, inferred, queried
81	reverse left-lateral strike-slip fault, known or certain
82	reverse left-lateral strike-slip fault, approximate
83	reverse left-lateral strike-slip fault, concealed
84	reverse left-lateral strike-slip fault, queried
85	reverse left-lateral strike-slip fault, approximate, queried
86	reverse left-lateral strike-slip fault, concealed, queried
87	reverse left-lateral strike-slip fault, inferred
88	reverse left-lateral strike-slip fault, inferred, queried
91	normal right-lateral strike-slip fault, known or certain
92	normal right-lateral strike-slip fault, approximate
93	normal right-lateral strike-slip fault, concealed
94	normal right-lateral strike-slip fault, queried
95	normal right-lateral strike-slip fault, approximate, queried
96	normal right-lateral strike-slip fault, concealed, queried
97	normal right-lateral strike-slip fault, inferred
98	normal right-lateral strike-slip fault, inferred, queried
101	normal left-lateral strike-slip fault, known or certain
102	normal left-lateral strike-slip fault, approximate
103	normal left-lateral strike-slip fault, concealed
104	normal left-lateral strike-slip fault, queried
105	normal left-lateral strike-slip fault, approximate, queried
106	normal left-lateral strike-slip fault, concealed, queried
107	normal left-lateral strike-slip fault, inferred
108	normal left-lateral strike-slip fault, inferred, queried
111	fault, unknown offset, known or certain
112	fault, unknown offset, approximate
113	fault, unknown offset, concealed
114	fault, unknown offset, queried
115	fault, unknown offset, approximate, queried
116	fault, unknown offset, concealed, queried
117	fault, unknown offset, inferred
118	fault, unknown offset, inferred, queried
121	high-angle reverse fault, known or certain
122	high-angle reverse fault, approximate
123	high-angle reverse fault, concealed
124	high-angle reverse fault, queried
125	high-angle reverse fault, approximate, queried
126	high-angle reverse fault, concealed, queried
127	high-angle reverse fault, unknown offset, inferred
128	high-angle reverse fault, unknown offset, inferred, queried
131	detachment fault/decollement, known or certain
132	detachment fault/decollement, approximate
133	detachment fault/decollement, concealed
134	detachment fault/decollement, queried

FLT_LT Code Value List (cont.)

135	detachment fault/decollement, approximate, queried
136	detachment fault/decollement, concealed, queried
137	detachment fault/decollement, unknown offset, inferred
138	detachment fault/decollement, unknown offset, inferred, queried
141	high angle fault, known or certain
142	high angle fault, approximate
143	high angle fault, concealed
144	high angle fault, queried
145	high angle fault, approximate, queried
146	high angle fault, concealed, queried
147	high angle fault, inferred
148	high angle fault, inferred, queried
151	right-lateral fault, vertical displacement/offset unknown, known or certain
152	right-lateral fault, vertical displacement/offset unknown, approximate
153	right-lateral fault, vertical displacement/offset unknown, concealed
154	right-lateral fault, vertical displacement/offset unknown, queried
155	right-lateral fault, vertical displacement/offset unknown, approximate, queried
156	right-lateral fault, vertical displacement/offset unknown, concealed, queried
157	right-lateral fault, vertical displacement/offset unknown inferred
158	right-lateral fault, vertical displacement/offset unknown, inferred, queried
161	left-lateral fault, vertical displacement/offset unknown, known or certain
162	left-lateral fault, vertical displacement/offset unknown, approximate
163	left-lateral fault, vertical displacement/offset unknown, concealed
164	left-lateral fault, vertical displacement/offset unknown, queried
165	left-lateral fault, vertical displacement/offset unknown, approximate, queried
166	left-lateral fault, vertical displacement/offset unknown, concealed, queried
167	left-lateral fault, vertical displacement/offset unknown inferred
168	left-lateral fault, vertical displacement/offset unknown, inferred, queried
171	gravity slide plane, known or certain
172	gravity slide plane, approximate
173	gravity slide plane, concealed
174	gravity slide plane, queried
175	gravity slide plane, approximate, queried
176	gravity slide plane, concealed, queried
177	gravity slide plane, inferred
178	gravity slide plane, inferred, queried
181	overturned thrust fault, known or certain
182	overturned thrust fault, approximate
183	overturned thrust fault, concealed
184	overturned thrust fault, queried
185	overturned thrust fault, approximate, queried
186	overturned thrust fault, concealed, queried
187	overturned thrust fault, inferred
188	overturned thrust fault, inferred, queried
191	high-angle right-lateral strike slip fault, known or certain
192	high-angle right-lateral strike-slip fault, approximate
193	high-angle right-lateral strike-slip fault, concealed
194	high-angle right-lateral strike-slip fault, queried
195	high-angle right-lateral strike-slip fault, approximate, queried
196	high-angle right-lateral strike-slip fault, concealed, queried

FLT_LT Code Value List (cont.)

197	high-angle right-lateral strike-slip fault, inferred
198	high-angle right-lateral strike-slip fault, inferred, queried
201	high-angle left-lateral strike-slip fault, known or certain
202	high-angle left-lateral strike-slip fault, approximate
203	high-angle left-lateral strike-slip fault, concealed
204	high-angle left-lateral strike-slip fault, queried
205	high-angle left-lateral strike-slip fault, approximate, queried
206	high-angle left-lateral strike-slip fault, concealed, queried
207	high-angle left-lateral strike-slip fault, inferred
208	high-angle left-lateral strike-slip fault, inferred, queried
211	overturned detachment fault/decollement, known or certain
212	overturned detachment fault/decollement, approximate
213	overturned detachment fault/decollement, concealed
214	overturned detachment fault/decollement, queried
215	overturned detachment fault/decollement, approximate, queried
216	overturned detachment fault/decollement, concealed, queried
217	overturned detachment fault/decollement, inferred
218	overturned detachment fault/decollement, inferred, queried
221	vertical fault, known or certain
222	vertical fault, approximate
223	vertical fault, concealed
224	vertical fault, queried
225	vertical fault, approximate, queried
226	vertical fault, concealed, queried
227	vertical fault, inferred
228	vertical fault, inferred, queried
231	thrust right-lateral strike-slip fault, known or certain
232	thrust right-lateral strike-slip fault, approximate
233	thrust right-lateral strike-slip fault, concealed
234	thrust right-lateral strike-slip fault, queried
235	thrust right-lateral strike-slip fault, approximate, queried
236	thrust right-lateral strike-slip fault, concealed, queried
237	thrust right-lateral strike-slip fault, inferred
238	thrust right-lateral strike-slip fault, inferred, queried
241	thrust left-lateral strike-slip fault, known or certain
242	thrust left-lateral strike-slip fault, approximate
243	thrust left-lateral strike-slip fault, concealed
244	thrust left-lateral strike-slip fault, queried
245	thrust left-lateral strike-slip fault, approximate, queried
246	thrust left-lateral strike-slip fault, concealed, queried
247	thrust left-lateral strike-slip fault, inferred
248	thrust left-lateral strike-slip fault, inferred, queried
251	ductile fault, known or certain
252	ductile fault, approximate
253	ductile fault, concealed
254	ductile fault, queried
255	ductile fault, approximate, queried
256	ductile fault, concealed, queried
257	ductile fault, inferred
258	ductile fault, inferred, queried

261	normal fault, horizontal displacement/offset unknown, known or certain
262	normal fault, horizontal displacement/offset unknown, approximate
263	normal fault, horizontal displacement/offset unknown, concealed
264	normal fault, horizontal displacement/offset unknown, queried
265	normal fault, horizontal displacement/offset unknown, approximate, queried
266	normal fault, horizontal displacement/offset unknown, concealed, queried
267	normal fault, horizontal displacement/offset unknown, inferred
268	normal fault, horizontal displacement/offset unknown, inferred, queried

FLTCNT Designates fault arc segments that are geologic contact arcs between different geologic, ash or surficial units. Fault arc segments that are contact arcs (FLTCNT = 'Y') are present in both the fault (CODEFLT) and either the geologic units/contacts (CODEGLG/CODEGLGA), ash units (CODEASHSA/CODEASHA), and/or surficial geologic units (CODESUR/CODESURA) coverages/themes.

FLTCNT Code List

Y	Yes, the fault <u>is</u> also a geologic contact arc
N	No, the fault is <u>not</u> also a geologic contact arc

FLT_NM The name of the fault. Fault arcs without an assigned name have a value of 'NA'. Fault arcs that have the same identification number (FLT_IDX, see field description above) should have the same fault name. Fault arcs that contact a map edge may have a fault name indicated on an adjacent geologic map.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Fault/Contact Arcs in Multiple Themes: Fault arcs that are also geologic contacts between different geologic units or are also linear geologic units (FLTCNT = 'Y', see FLTCNT field description above) are present in both the fault (CODEFLT) and geology (CODEGLG) themes, or the fault (CODEFLT) and linear geologic (CODEGLN) themes, respectively.
- 2.) Fault Arc Directionality: Fault arcs are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). The down-thrown fault-

block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

FOLDS (CODEFLD)

Coverage consists of geologic fold and hinge lines.

SPATIAL THEME (FILENAME): Geologic Folds (CODEFLD)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEFLD.AAT (ArcInfo), CODEFLD.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEFLD_*	B (Binary)	4	5	-
CODEFLD_ID*	B (Binary)	4	5	-
FLD_IDX	I (Integer)	6	6	-
FLD_SEG_N	I (Integer)	3	3	-
FLD_SEG_T	I (Integer)	2	2	-
FLD_TYPE	I (Integer)	2	2	-
FLD_LT	I (Integer)	4	4	-
FLD_NM	C (Character)	60	60	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

FLD_IDX A unique sequential identification number for each fold. A fold axes can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of folds in the coverage/theme.

FLD_SEG_N A sequential number assigned to each arc segment of a fold. All arc segments of a fold must be continuous and have a common FLD_IDX number. Segment numbers are assigned starting at one end' of a fold. A value of 1 is assigned to one end of the fold. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that fold axis. A value of 0 may be is assigned to all arcs if 'conditions' justify so.

FLD_SEG_T A code value that designates the positional accuracy and/or concealment of a fold axis arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

FLD_SEG_T Code Value List

- | | |
|---|----------------------|
| 1 | known or certain |
| 2 | Approximate |
| 3 | concealed |
| 4 | queried |
| 5 | approximate, queried |
| 6 | concealed, queried |
| 7 | inferred location |
| 8 | inferred, queried |

FLD_TYPE A code value used to differentiate fold type. Refer to the geologic map legend for graphical representation of fold axes as well as the accompanying map notes and/or report on fold types. In addition, fold arcs that contact a map edge may have additional information pertinent to that fold on an adjacent geologic map.

FLD_TYPE Code Value List

- | | |
|----|--------------------------------------|
| 1 | anticline |
| 2 | syncline |
| 3 | overturned anticline |
| 4 | overturned syncline |
| 5 | monocline, anticlinal bend |
| 6 | monocline, synclinal bend |
| 7 | antiform |
| 8 | synform |
| 9 | overturned antiform |
| 10 | overturned synform |
| 11 | neutral fold with vertical axis |
| 12 | asymmetrical anticline |
| 13 | asymmetrical syncline |
| 14 | monocline |
| 15 | fold hinge length exposed at surface |
| 16 | hinge line |
| 17 | antiformal syncline |
| 18 | synformal anticline |
| 19 | cleavage trough |

FLD_LT A code value for graphical line type representation of a fold arc segment. The code value is derived from the segment type (FLD_SEG_T, see field description above) and fold type (FLD_TYPE, see field description above). The code value is calculated by multiplying the FLD_TYPE value by 10, then adding the FLD_SEG_T value to the sum.

FLD_LT Code Value List

- | | |
|----|---------------------------------|
| 11 | anticline, known or certain |
| 12 | anticline, approximate |
| 13 | anticline, concealed |
| 14 | anticline, queried |
| 15 | anticline, approximate, queried |

FLD_LT Code Value List (cont.)

16	anticline, concealed, queried
17	anticline, inferred
18	anticline, inferred, queried
21	syncline, known or certain
22	syncline, approximate
23	syncline, concealed
24	syncline, queried
25	syncline, approximate, queried
26	syncline, concealed, queried
27	syncline, inferred
28	syncline, inferred, queried
31	overturned anticline, known or certain
32	overturned anticline, approximate
33	overturned anticline, concealed
34	overturned anticline, queried
35	overturned anticline, approximate, queried
36	overturned anticline, concealed, queried
37	overturned anticline, inferred
38	overturned anticline, inferred, queried
41	overturned syncline, known or certain
42	overturned syncline, approximate
43	overturned syncline, concealed
44	overturned syncline, queried
45	overturned syncline, approximate, queried
46	overturned syncline, concealed, queried
47	overturned syncline, inferred
48	overturned syncline, inferred, queried
51	monocline, anticlinal bend, known or certain
52	monocline, anticlinal bend, approximate
53	monocline, anticlinal bend, concealed
54	monocline, anticlinal bend, queried
55	monocline, anticlinal bend, approximate, queried
56	monocline, anticlinal bend, concealed, queried
57	monocline, anticlinal bend, inferred
58	monocline, anticlinal bend, inferred, queried
61	monocline, synclinal bend, known or certain
62	monocline, synclinal bend, approximate
63	monocline, synclinal bend, concealed
64	monocline, synclinal bend, queried
65	monocline, synclinal bend, approximate, queried
66	monocline, synclinal bend, concealed, queried
67	monocline, synclinal bend, inferred
68	monocline, synclinal bend, inferred, queried
71	antiform, known or certain
72	antiform, approximate
73	antiform, concealed
74	antiform, queried
75	antiform, approximate, queried
76	antiform, concealed, queried
77	antiform, inferred

FLD_LT Code Value List (cont.)

78	antiform, inferred, queried
81	synform, known or certain
82	synform, approximate
83	synform, concealed
84	synform, queried
85	synform, approximate, queried
86	synform, concealed, queried
87	synform, inferred
88	synform, inferred, queried
91	overturned antiform, known or certain
92	overturned antiform, approximate
93	overturned antiform, concealed
94	overturned antiform, queried
95	overturned antiform, approximate, queried
96	overturned antiform, concealed, queried
97	overturned antiform, inferred
98	overturned antiform, inferred, queried
101	overturned synform, known or certain
102	overturned synform, approximate
103	overturned synform, concealed
104	overturned synform, queried
105	overturned synform, approximate, queried
106	overturned synform, concealed, queried
107	overturned synform, inferred
108	overturned synform, inferred, queried
111	neutral fold with vertical axis, known or certain
112	neutral fold with vertical axis, approximate
113	neutral fold with vertical axis, concealed
114	neutral fold with vertical axis, queried
115	neutral fold with vertical axis, approximate, queried
116	neutral fold with vertical axis, concealed, queried
117	neutral fold with vertical axis, inferred
118	neutral fold with vertical axis, inferred, queried
121	asymmetrical anticline, known or certain
122	asymmetrical anticline, approximate
123	asymmetrical anticline, concealed
124	asymmetrical anticline, queried
125	asymmetrical anticline, approximate, queried
126	asymmetrical anticline, concealed, queried
127	asymmetrical anticline, inferred
128	asymmetrical anticline, inferred, queried
131	asymmetrical syncline, known or certain
132	asymmetrical syncline, approximate
133	asymmetrical syncline, concealed
134	asymmetrical syncline, queried
135	asymmetrical syncline, approximate, queried
136	asymmetrical syncline, concealed, queried
137	asymmetrical syncline, inferred
138	asymmetrical syncline, inferred, queried
141	monocline, known or certain

FLD_LT Code Value List (cont.)

142	monocline, approximate
143	monocline, concealed
144	monocline, queried
145	monocline, approximate, queried
146	monocline, concealed, queried
147	monocline, inferred
148	monocline, inferred, queried
151	fold hinge length exposed at surface, known or certain
152	fold hinge length exposed at surface, approximate
153	fold hinge length exposed at surface, concealed
154	fold hinge length exposed at surface, queried
155	fold hinge length exposed at surface, approximate, queried
156	fold hinge length exposed at surface, concealed, queried
157	fold hinge length exposed at surface, inferred
158	fold hinge length exposed at surface, inferred, queried
161	hinge line, known or certain
162	hinge line, approximate
163	hinge line, concealed
164	hinge line, queried
165	hinge line, approximate, queried
166	hinge line, concealed, queried
167	hinge line, inferred
168	hinge line, inferred, queried
171	antiformal syncline, known or certain
172	antiformal syncline, approximate
173	antiformal syncline, concealed
174	antiformal syncline, queried
175	antiformal syncline, approximate, queried
176	antiformal syncline, concealed, queried
177	antiformal syncline, inferred
178	antiformal syncline, inferred, queried
181	synformal anticline, known or certain
182	synformal anticline, approximate
183	synformal anticline, concealed
184	synformal anticline, queried
185	synformal anticline, approximate, queried
186	synformal anticline, concealed, queried
187	synformal anticline, inferred
188	synformal anticline, inferred, queried
191	cleavage trough, known or certain
192	cleavage trough, approximate
193	cleavage trough, concealed
194	cleavage trough, queried
195	cleavage trough, approximate, queried
196	cleavage trough, concealed, queried
197	cleavage trough, inferred
198	cleavage trough, inferred, queried

FLD_NM The name of the fold. Fold arcs without an assigned name have a value of 'NA'. Fold arcs that have the same identification number (FLD_IDX, see field description above) should have the same

fold name. Fold arcs that contact a map edge may have a fold name indicated on an adjacent geologic map.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Plunging Fold Lines - Fold arcs that end with a plunge arrow should extend to the 'tip' of the plunge arrowhead symbol.
-

ATTITUDE POINTS (CODEATD)

Coverage consists of attitude observation points as well as fault observations, and fault and fold related symbology.

SPATIAL THEME (FILENAME): Geologic Attitude Points (CODEATD)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEATD.PAT (ArcInfo), CODEATD.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 13

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEATD_*	B (Binary)	4	5	-
CODEATD_ID*	B (Binary)	4	5	-
ATD_IDX	I (Integer)	6	6	-
ATD_TYPE	I (Integer)	3	3	-
ATD_ST	I (Integer)	3	3	-
ATD_DP	I (Integer)	4	4	-
ATD_NOTE	C (Character)	254	254	-
ATD_AV_ROT	I (Integer)	3	3	-
ATD_AM_ROT	I (Integer)	3	3	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

ATD_IDX A unique sequential identification number for each point. The field values range from 1 to n, where n is the number of point features in the coverage/theme.

ATD_TYPE A code value used to indicate the type of attitude observation or map attitude symbology depiction. Refer to the geologic map legend for graphical representation of attitude features.

ATD_TYPE Code Value List

- 1 strike and dip of beds
- 2 strike and dip of overturned beds
- 3 strike of vertical beds
- 4 horizontal beds*%
- 5 strike and dip of beds, tops known from sedimentary structures
- 6 strike and dip of overturned beds, tops known from sedimentary structures
- 7 strike and dip of beds, tops known from sedimentary structures, dot indicates top of beds
- 8 strike and dip of variable bedding
- 9 approximate strike and dip of beds
- 10 strike of beds, dip amount unspecified

ATD_TYPE Code Value List (cont.)

- 11 strike of overturned beds, dip amount unspecified
- 12 strike of beds, tops known from sedimentary structures, amount of dip unspecified
- 13 strike of variable bedding, dip amount unspecified
- 14 approximate strike of beds, dip amount unspecified
- 15 strike of variable vertical beds
- 16 strike and dip of bedding in phacoids in shear zones
- 17 strike and dip of bedding in phacoids in shear zones, tops known from sedimentary structures
- 18 strike of bedding in phacoids in shear zones, tops known from sedimentary structures, amount of dip unspecified
- 19 crumpled, plicated, crenulated, or undulatory beds and average dip
- 20 strike and dip of foliation and bedding
- 21 strike of vertical foliation and bedding
- 22 strike and dip of variable bedding and foliation
- 23 strike and dip of foliation
- 24 strike of vertical foliation
- 25 horizontal foliation*%
- 26 strike and dip of variable foliation
- 27 strike of foliation, dip amount unspecified
- 28 strike of variable foliation, vertical dip
- 29 strike and dip of joints
- 30 strike of joints, dip amount unspecified
- 31 strike of vertical joints
- 32 trend and plunge of lineation
- 33 vertical lineation
- 34 horizontal lineation
- 35 trend of lineation, plunge unspecified
- 36 strike and dip of cleavage
- 37 strike of cleavage, dip unspecified
- 38 trend and plunge of minor antiform
- 39 trend and plunge of minor synform
- 40 trend of minor antiform, plunge amount unspecified
- 41 trend of minor synform, plunge amount unspecified
- 42 fold plunge arrow head*
- 43 trend of oriented inclusions
- 44 strike and dip of layering (flow, compositional)
- 45 strike of vertical layering (flow, compositional)
- 46 direction of movement of landslide, mudflows and debris flows*#
- 47 fault dip amount
- 48 fault up 'U' indicator*#
- 49 fault down 'D' indicator*#
- 50 fault down-side (bar and ball) indicator*#
- 51 vertical fault plane
- 52 trend of oriented inclusions#
- 53 drag fold, hinge line of small fold#
- 54 dip of contact*
- 55 general trend of contorted foliation
- 56 general trend of contorted vertical foliation
- 57 monocline symbol*#
- 58 anticline symbol*#

ATD_TYPE Code Value List (cont.)

59	syncline symbol*#
60	overturned anticline symbol*#
61	overturned syncline symbol*#
62	monocline, anticlinal bend symbol*#
63	monocline, synclinal bend symbol*#
64	antiform symbol*#
65	synform symbol*#
66	overturned antiform symbol*#
67	overturned synform symbol*#
68	monocline, maximum inflection of dip*#
69	strike and dip of foliation, folded
70	strike and dip of foliation with inclusions
71	strike of vertical foliation with inclusions
72	dip of overturned contact*
73	neutral fold with vertical fold axis#
74	asymmetrical anticline symbol*#
75	asymmetrical syncline symbol*#
76	fault displacement amount*%
77	dip of inclined feature*
78	dip of slickensides*
79	fault block movement direction arrow (right-lateral)*#
80	fault block movement direction arrow (left-lateral)*#
81	dome symbol*#
82	basin symbol*#
83	strike and dip of axial plane of fold
84	strike of vertical axial plane of minor fold
85	trend and plunge of minor fold axis
86	trend of horizontal minor fold axis
87	component of dip*
88	strike of approximately vertical joints
89	strike and dip of beds, inferred
90	dip of anticlinal fold limb
91	dip of synclinal fold limb
92	dip of monoclinial fold limb
93	'Y' (younger) age-relationship of contiguous geologic units*#
94	'O' (older) age-relationship of contiguous geologic units*#
95	paleocurrent direction indicator
96	axis of m/w fold (crest of refolded fold)
97	strike and dip of dike
98	strike of vertical dike
99	trend and plunge of intersection between dominant foliation and bedding
100	strike and dip of vein
101	strike of vertical vein
102	small-scale fault or shear zone
103	trend of glacial striations
104	sedimentary parting*#
105	strike and dip of igneous fabric
106	strike of vertical cleavage
107	strike and dip of bedding and cleavage
108	trend and plunge of intersection of bedding and cleavage

ATD_TYPE Code Value List (cont.)

109	trend and plunge of slickenlines or groves
110	trend of horizontal intersection of bedding and cleavage
111	minor fold of/in cleavage
112	horizontal schistosity*%
113	trend and plunge of intersection of cleavage and cleavage
114	antiformal syncline symbol*#
115	synformal anticline symbol*#
116	trend and plunge of linear feature
117	trend of horizontal linear feature
118	trend and plunge of crenulation
119	strike and dip of sheeting
120	strike of vertical sheeting
121	strike and dip of schistosity
122	strike of vertical schistosity
123	strike and dip of pseudo cleavage
124	strike and dip of extensional fractures
125	horizontal cleavage*%
126	strike and dip of fault as seen in outcrop
127	trend and plunge of fold axis
128	trend and plunge of minor anticline
129	trend and plunge of minor syncline
130	trend and plunge of minor asymmetric fold
131	strike and dip of inclusion
132	strike of vertical inclusion
133	horizontal inclusion*%
134	strike of vertical extensional fractures
135	strike of vertical fault as seen in outcrop
136	cleavage trough symbol
137	dip of fault as seen in outcrop
138	trend of horizontal intersection of cleavage and cleavage
139	bearing and plunge of sinistral fold
140	bearing and plunge of dextral fold
141	strike and dip of foliation parallel to bedding (coplanar)
142	strike of dike, dip amount unspecified
143	bearing and plunge of axis of columnar joints
144	bearing and plunge of axes of boudinage
145	strike of vertical beds, top known from sedimentary features
146	strike and dip of foliation and bedding, tops known from local features
147	strike and dip of shear planes, inclined
148	strike and dip of shear planes, vertical
149	strike and dip of shear planes, inclined, strike variable
150	strike and dip of shear planes, vertical, strike variable
151	strike and dip of overturned foliation and bedding, tops known from local features
152	no foliation apparent
153	strike of vertical foliation, dip variable
154	strike of vertical foliation, strike and dip variable
155	strike of inclined foliation, strike variable
156	strike of inclined foliation, dip variable
157	strike of vertical cataclastic foliation
158	strike of inclined cataclastic foliation, dip amount unspecified

ATD_TYPE Code Value List (cont.)

159	direction of increasing grain size
160	strike of vertical secondary foliation in plutonic rocks
161	inclined cataclastic foliation with variable strike
162	vertical cataclastic foliation with variable strike
163	vertical dike with variable strike
164	vertical contact
165	top of bed indicated by sedimentary structure#
166	strike of foliation and bedding, dip amount unspecified#
167	dip of contact, dip amount unspecified#
168	trend of slickenlines or grooves, plunge amount unspecified#
169	strike of shear planes, dip amount unspecified#
170	strike of shear planes, strike variable, dip amount unspecified#
171	strike of overturned beds, tops known from sedimentary structures, dip amount unspecified#
172	horizontal dike*
173	foliation widely variable*#
174	fault dip direction, dip amount unspecified#
175	strike of variable foliation, dip amount unspecified#
176	strike and dip of foliation, dip steep but uncertain
177	strike and dip of ductile foliation, inclined
178	strike and dip of ductile foliation, vertical
179	strike and dip of ductile foliation, dip steep but uncertain

Attitude types with non-applicable strike/trend value are denoted with an asterisk (*), (see ATD_ST field description below). Attitude types with non-applicable dip/plunge value are denoted with a number or pound sign (#),(see ATD_DP field description below). Attitude types with a non-applicable rotation value (see ATD_AV_ROT field description below) are denoted with a percent sign (%),

ATD_ST The azimuth of strike (planar measurements) or trend (linear measurements). The value ranges from 0 (north) clockwise to 359. For strike measurements, the azimuth value is determined using the right-rule method, dip direction 90⁰ clockwise from the strike azimuth. For attitude types with non-applicable strike/trend value, horizontal attitude observations or fault and fold point symbology, denoted in the ATD_TYPE Code Value List with an asterisk (*), (see ATD_TYPE field description above) a value of 999 is assigned.

ATD_DP The dip (planar measurements) or plunge (linear measurements) value associated with the attitude observation. The value ranges from 0 (horizontal) to 90 (vertical). For attitude types with non-applicable dip/plunge value, fault and fold point symbology, or non-determined or undeterminable attitude types, denoted in the ATD_DP Code Value List with a pound sign (number; #), (see ATD_TYPE field description above), a value of 99 is assigned. If a range of dip or plunge measurements is noted, enter the average of the value range, rounding fractions up.

ATD_NOTE Text notes and remarks about attitude observation point.

ATD_AV_ROT A value that rotates an attitude point feature symbol in ArcView 3.X so that the feature symbol corresponds to the source map's representation of that feature. The rotation value is dependent on the attitude type (see ATD_TYPE field description above), the ArcView 3.X symbology and default or non-rotated symbol orientation, and the orientation of the map feature. The value ranges from 0 (non-rotated) to 359. Attitude types with a non-applicable rotation value are assigned a rotation value of 0 (non-rotated), and are denoted in the ATD_TYPE Code Value List with a percent sign (%), (see

ATD_TYPE field description above). For attitude types with an applicable rotation value, the value can either be determined from a strike/trend azimuth value if known or determinable and applicable, by measuring the feature's attitude or orientation directly from the source map, or by entering a rotation value so that the feature's symbol representation rotates to correspond with the source map's image representation of that feature. (see ATD_ST field description above, and Special Guidelines Section (#2) below).

ATD_AM_ROT A value that rotates an attitude point feature symbol in ArcMap so that the feature symbol corresponds to the source map's representation of that feature. The rotation value is dependent on the attitude type (see ATD_TYPE field description above), the ArcMap symbology, the default or non-rotated symbol orientation, the rotation rule (i.e. either 'geographic' or 'arithmetic' in ArcMap), and the orientation of the feature. As the rotation value for geologic attitude and observation points with strike/trend values is equal to a 'geographic' rule rotation (0° is north with clockwise rotation to 359°) this rule is 'preferred' in displaying symbology in ArcMap. The value ranges from 0° (non-rotated or north) to 359° . Attitude types with a non-applicable rotation value are assigned a rotation value of 0 (non-rotated), and are denoted in the ATD_TYPE field list with a percent sign (%), (see ATD_TYPE field description above). For attitude types with an applicable rotation value, the value can either be determined from a strike/trend azimuth value if known or determinable and applicable, by measuring the feature's attitude or orientation directly from the source map, or by entering a rotation value so that the feature's symbol representation rotates to correspond with the source map's image representation of that feature. (see ATD_ST field description above, and Special Feature Coverage Guidelines #2 below).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For a good number of attitude point types, placement of a digitized point is at the center of the point's graphical symbol. However, for many attitude points that represent fault or fold type, directionality and/or attitude, point placement should be on the related fault or fold arc/line.
- 2.) Feature Symbol Rotation and Strike/Trend Values: The rotation value used to correctly orient many attitude feature symbols in ArcView 3.X, as mentioned in the ATD_AV_ROT field description presented above, is dependent on the type of attitude feature, the symbology used to represent that feature in ArcView 3.X, and the default or non-rotated orientation of that symbol. For many of these features, a directional component or azimuth, either strike or trend, measured at the locality is conveyed in the graphical orientation of that feature, and is therefore directly related to a value that rotates the orientation of that feature's symbol. Thus, it is possible to determine the ATD_ST value

from the ATD_AV_ROT field, and vice versa. Formulas to calculate the ATD_ST value from the ATD_AV_ROT value, and vice versa, are presented in an appendix file, ATDAVROT.DOC.

AGE-DATE POINTS (CODEDAT)

Coverage consists of paleontological and radiometric age-dating localities.

SPATIAL THEME (FILENAME): Age-Date Points (CODEDAT)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEDAT.PAT (ArcInfo), CODEDAT.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 13

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEDAT_*	B (Binary)	4	5	-
CODEDAT_ID*	B (Binary)	4	5	-
DAT_IDX	I (Integer)	6	6	-
DAT_CD	I (Integer)	2	2	-
DAT_AGE	C (Character)	100	100	-
DAT_NOTE	C (Character)	254	254	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DAT_IDX A unique sequential identification number for each point. The field values range from 1 to n, where n is the number of point features in the coverage/theme.

DAT_CD A code value used to indicate the type of age-dating technique.

DAT_CD Code Value List

- | | |
|---|-----------------|
| 1 | radiometric |
| 2 | paleontological |

DAT_AGE Relative or absolute age of age-date sample.

DAT_NOTE Text notes and remarks about age-date sample.

GLG_SYM Age-lithology symbol/code of geologic unit age-date sample was taken/derived from. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code geologic unit age-date sample was taken/derived from. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool. Each digital map typically has one Help File (CODE_GEOLOGY.HLP) with information for all themes produced from the source map as per the NPS GRE Geology-GIS Coverage/Shapefile Data Model.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For age-date localities, placement of a digitized point is at the center of the point's graphical symbol.
-

VOLCANIC POINT FEATURES (CODEVNT)

Coverage consists of non-sensitive volcanic features mapped as point localities.

SPATIAL THEME (FILENAME): Volcanic Point Features (CODEVNT)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEVNT.PAT (ArcInfo), CODEVNT.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEVNT_*	B (Binary)	4	5	-
CODEVNT_ID*	B (Binary)	4	5	-
VNT_IDX	I (Integer)	6	6	-
VNT_TYPE	I (Integer)	2	2	-
VNT_NOTE	C (Character)	254	254	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

VNT_IDX A unique sequential identification number for each point feature. The field values range from 1 to n, where n is the number of point features in the coverage/theme.

VNT_TYPE A code value used to indicate the type of volcanic feature.

VNT_TYPE Code Value List

1	cone
2	spatter cone
3	rootless vent
4	natural arch
5	natural bridge
6	natural window
7	lava tree
8	treemold
9	vent
10	general location of vent source
11	teepee circle(s)
12	thermal spring
13	fumarole

VNT_TYPE Code Value List (cont.)

- 14 plug
- 15 outcrop of vitric tuff or cinders

VNT_NOTE Text note on volcanic point feature.

GLG_SYM Age-lithology symbol/code of geologic unit volcanic point feature is located within. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of geologic unit volcanic point feature is located within. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For a good number of volcanic 'point' features, placement of a digitized point is at the center of the point's graphical symbol.
- 2.) Sensitive Volcanic Point Features: Volcanic 'point' features deemed sensitive by an NPS unit are captured in the sensitive point (CODESPF) coverage/theme. Sensitivity of a feature is determined by the NPS unit. Typical sensitive volcanic point features include cave openings, hollows, skylights and tunnels.

LINEAR VOLCANIC FEATURES (CODEVLN)

Coverage consists of linear volcanic line features.

SPATIAL THEME (FILENAME): Linear Volcanic Features (CODEVLN)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEVLN.AAT (ArcInfo), CODEVLN.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 19

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEVLN_*	B (Binary)	4	5	-
CODEVLN_ID*	B (Binary)	4	5	-
VLN_IDX	I (Integer)	6	6	-
VLN_SEG_N	I (Integer)	3	3	-
VLN_SEG_T	I (Integer)	2	2	-
VLN_TYPE	I (Integer)	2	2	-
VLN_LT	I (Integer)	4	4	-
VLN_NM	C (Character)	60	60	-
VLN_NOTE	C (Character)	254	254	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

VLN_IDX A unique sequential identification number for each linear volcanic feature. A feature can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of linear volcanic feature arcs in the coverage/theme.

VLN_SEG_N A sequential number assigned to each segment of a linear volcanic feature. All arc segments of a linear volcanic feature must be continuous and have a common VLN_IDX number. Segment numbers are assigned starting at a one end. A value of 1 is assigned to the 'starting' arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise the continuous linear volcanic feature. A value of 0 may be assigned to all arcs if 'conditions' justify so.

VLN_SEG_T A code value that designates the positional accuracy and/or concealment of a linear volcanic feature. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

VLN_SEG_T Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried

VLN_TYPE A code value used to differentiate the type of linear volcanic feature. Refer to the geologic map legend for graphical representation of linear volcanic feature as well as the accompanying map notes and/or report. In addition, linear volcanic feature arcs that contact a map edge may have additional information pertinent to that feature on an adjacent geologic map.

VLN_TYPE Code Value List

1	crater
2	pit crater
3	eruptive fissure
4	non-eruptive fissure
5	lava channel
6	lava pond
7	flow ridge, furrow, crack
8	flow direction line
9	crest line of crater
10	lava tube
11	caldera boundary

VLN_LT A code value for graphical line type representation of a linear volcanic feature arc segment. The code value is derived from the segment type (VLN_SEG_T , see field description above) and linear volcanic feature type (VLN_TYPE, see field description above). The code value is calculated by multiplying the VLN_TYPE value by 10, then adding the VLN_SEG_T value to the sum.

VLN_LT Code Value List

11	crater, known or certain
12	crater, approximate
13	crater, concealed
14	crater, queried
15	crater, approximate, queried
16	crater, concealed, queried
17	crater, inferred
18	crater, inferred, queried
21	pit crater, known or certain
22	pit crater, approximate
23	pit crater, concealed
24	pit crater, queried

VLN_LT Code Value List (cont.)

25	pit crater, approximate, queried
26	pit crater, concealed, queried
27	pit crater, inferred
28	pit crater, inferred, queried
31	eruptive fissure, known or certain
32	eruptive fissure, approximate
33	eruptive fissure, concealed
34	eruptive fissure, queried
35	eruptive fissure, approximate, queried
36	eruptive fissure, concealed, queried
37	eruptive fissure, inferred
38	eruptive fissure, inferred, queried
41	non-eruptive fissure, known or certain
42	non-eruptive fissure, approximate
43	non-eruptive fissure, concealed
44	non-eruptive fissure, queried
45	non-eruptive fissure, approximate, queried
46	non-eruptive fissure, concealed, queried
47	non-eruptive fissure, inferred
48	non-eruptive fissure, inferred, queried
51	lava channel, known or certain
52	lava channel, approximate
53	lava channel, concealed
54	lava channel, queried
55	lava channel, approximate, queried
56	lava channel, concealed, queried
57	lava channel, inferred
58	lava channel, inferred, queried
61	lava pond, known or certain
62	lava pond, approximate
63	lava pond, concealed
64	lava pond, queried
65	lava pond, approximate, queried
66	lava pond, concealed, queried
67	lava pond, inferred
68	lava pond, inferred, queried
71	flow ridge, furrow, crack, known or certain
72	flow ridge, furrow, crack, approximate
73	flow ridge, furrow, crack, concealed
74	flow ridge, furrow, crack, queried
75	flow ridge, furrow, crack, approximate, queried
76	flow ridge, furrow, crack, concealed, queried
77	flow ridge, furrow, crack, inferred
78	flow ridge, furrow, crack, inferred, queried
81	flow direction line, known or certain
82	flow direction line, approximate
83	flow direction line, concealed
84	flow direction line, queried
85	flow direction line, approximate, queried
86	flow direction line, concealed, queried

VLN_LT Code Value List (cont.)

87	flow direction line, inferred
88	flow direction line, inferred, queried
91	crest line of crater, known or certain
92	crest line of crater, approximate
93	crest line of crater, concealed
94	crest line of crater, queried
95	crest line of crater, approximate, queried
96	crest line of crater, concealed, queried
97	crest line of crater, inferred
98	crest line of crater, inferred, queried
101	lava tube, known or certain
102	lava tube, approximate
103	lava tube, concealed
104	lava tube, queried
105	lava tube, approximate, queried
106	lava tube, concealed, queried
107	lava tube, inferred
108	lava tube, inferred, queried
111	caldera boundary, known or certain
112	caldera boundary, approximate
113	caldera boundary, concealed
114	caldera boundary, queried
115	caldera boundary, approximate, queried
116	caldera boundary, concealed, queried
117	caldera boundary, inferred
118	caldera boundary, inferred, queried

VLN_NM The name of linear volcanic feature. Volcanic linear feature arcs without an assigned name have a value of 'NA'. Linear volcanic feature arcs that have the same identification number (VLN_IDX, see field description above) should have the same name. Linear volcanic feature arcs that contact a map edge may have a name indicated on an adjacent geologic map.

VLN_NOTE Text note on feature.

GLG_SYM Age-lithology symbol/code of volcanic unit associated with linear volcanic feature. Common to all arc segments with the same VLN_IDX number (see field description above). The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of volcanic unit associated with linear volcanic feature. Common to all arc segments with the same VLN_IDX number (see field description above). The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 99 is typically assigned to water areas.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-

one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Linear Volcanic Feature Arc Directionality: For flow direction lines (VLN_TYPE of 8, see field description above) arc segments are to be captured in the direction of flow, as indicated on the source map. Thus, the starting or from node (FNODE_) should be the 'starting point' of the arc. For crater lines (VLN_TYPE of 1), pit crater lines (VLN_TYPE of 2), flow ridge lines (VLN_TYPE of 7) and crest line of crater (VLN_TYPE of 10) arc segments are to be captured with the down-direction or slope on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-direction or slope should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.
-

LINEAR DIKES (CODEDKE)

Coverage consists of geologic dikes mapped as linear features.

SPATIAL THEME (FILENAME): Geologic Linear Dikes (CODEDKE)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEDKE.AAT (ArcInfo), CODEDKE.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 17

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEDKE_*	B (Binary)	4	5	-
CODEDKE_ID*	B (Binary)	4	5	-
DKE_IDX	I (Integer)	6	6	-
DKE_SEG_N	I (Integer)	3	3	-
DKE_SEG_T	I (Integer)	2	2	-
DKE_NM	C (Character)	60	60	-
DKEFLT	C (Character)	1	1	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DKE_IDX A unique sequential identification number for each linear dike. A linear dike can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of linear dikes in the coverage/theme.

DKE_SEG_N A sequential number assigned to each arc segment of a linear dike. All arc segments of a linear dike must be continuous and have a common DKE_IDX number. Segment numbers are assigned starting at one end of the dike arc. A value of 1 is assigned to the 'starting' linear dike arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that linear dike. For linear dikes where the down-thrown block can not be determined or is not applicable, either end of the linear dike will suffice for the 'starting' arc. A value of 0 may be is assigned to all arcs if 'conditions' justify so.

DKE_SEG_T A code value that designates the positional accuracy and/or concealment of a linear dike arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

DKE_SEG_T Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried

DKE_SEG_T Code Value List
16 subaqueous (inferred)

DKE_NM The name of the linear dike. Linear dike arcs without an assigned name have a value of 'NA'. Linear dike arcs that have the same identification number (DKE_IDX, see field description above) should have the same linear dike name.

DKEFLT Designates linear dike arc segments that are mapped along geologic faults. Linear dike arc segments that are also mapped as fault arcs (DKEFLT = 'Y') are present in both the linear dike (CODEDKE) and fault (CODEFLT) themes.

DKEFLT Code List

Y Yes, the linear dike is also a geologic contact between different geologic units
N No, the linear dike is not also a geologic contact between different geologic units

GLG_SYM Age-lithology symbol/code of geologic unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of geologic unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Linear Dikes/Fault Arcs in Multiple Themes: Linear dike arcs that are also fault arcs (DKEFLT = 'Y', see DKEFLT field description above) are present in both the linear dike (CODEDKE) and fault (CODEFLT) themes.
- 2.) Linear Dike/Fault Arc Directionality: Linear dike arcs that are mapped along faults (DKEFLT = 'Y', see DKEFLT field description above) are captured with the down-thrown fault block, if applicable,

on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). The down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

DIKE SWARM AREAS (CODEDKS)

Coverage consists of areas of dikes too numerous to map as individual segments (e.g. dike swarms).

SPATIAL THEME (FILENAME): Dike Swarms (CODEDKS)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEDKS.PAT (ArcInfo), CODEDKS.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEDKS_*	B (Binary)	4	5	-
CODEDKS_ID*	B (Binary)	4	5	-
DKS_IDX	I (Integer)	6	6	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DKS_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

GLG_SYM Age-lithology symbol/code of dikes. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below). A value of 'NA' is assigned to polygons that are not dike swarm areas (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

USGS_SYM USGS age-lithology symbol/code of dikes. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above). A value of 'NA' is assigned to polygons that are not dike swarm areas (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS

Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 0 is assigned to polygons that are not dike swarm areas (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEDKS coverage/theme that are bounded by one or more dike swarm polygons and are not dike swarm areas (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.

DIKE SWARM CONTACTS/BOUNDARIES (CODEDKS/CODEDKSA)

Coverage consists of contact/boundary arcs that define areas with dikes too numerous to map as individual segments (e.g. dike swarms). See the area dike swarm coverage (CODEDKS) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Dike Swarm Contacts/Boundaries (CODEDKS/ArcInfo),
(CODEDKSA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEDKS.AAT (ArcInfo), CODEDKSA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEDKSA_*	B (Binary)	4	5	-
CODEDKSA_ID*	B (Binary)	4	5	-
DKSCNT_IDX	I (Integer)	6	6	-
DKSCNT_TYP	I (Integer)	2	2	-
DKSFLT	C (Character)	1	1	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DKSCNT_IDX A unique sequential identification number for each contact/boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

DKSCNT_TYPE A code value that designates the positional accuracy and/or concealment of a contact/boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

DKSCNT_TYP Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried
- 9 gradational
- 10 quadrangle boundary
- 11 extent/map boundary
- 12 water/shoreline
- 13 water/shoreline, approximate
- 14 ice/glacial
- 15 ice/glacial approximate
- 16 subaqueous (inferred)

DKSFLT Designates dike swarm contact/boundary arcs that are also fault arcs. Contact/boundary arc segments that are also fault arcs (DKSFLT = 'Y') are present in both the area dike swarm (CODEDKS/CODEDKSA) and fault (CODEFLT) themes.

DKSFLT Code List

- Y Yes, the contact/boundary is also a fault
- N No, the contact/boundary is not also a fault

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

- 1.) Contact/Fault Arcs in Multiple Themes: Contact/boundary arcs that are also fault arcs (DKSFLT = 'Y', see DKSFLT field description above) are present in both the geologic contact/boundary (CODEDKS/CODEDKSA) and fault (CODEFLT) themes.
- 2.) Contact/Fault Arc Directionality: Contact/boundary/fault arcs (DKSFLT = 'Y', see DKSFLT field description above) are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

MINE AND MINING RELATED FEATURES (CODEMIN)

Coverage consists of mine and mine related features mapped as points.

SPATIAL THEME (FILENAME): Geologic Attitude Points (CODEMIN)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEMIN.PAT (ArcInfo), CODEMIN.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEMIN_*	B (Binary)	4	5	-
CODEMIN_ID*	B (Binary)	4	5	-
MIN_IDX	I (Integer)	6	6	-
MIN_TYPE	I (Integer)	3	3	-
MIN_NOTE	C (Character)	254	254	-
ID_CODE	C (Character)	50	50	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MIN_IDX A unique sequential identification number for mine and mine related features. The field values range from 1 to n, where n is the number of mine and mine related features in the coverage/theme.

MIN_TYPE A code value used to indicate the type of mine or mine related feature. Refer to the geologic map legend for graphical representation of mine and mine related features.

MIN_TYPE Code Value List

1	prospect
2	adit
3	shaft
4	mine
5	open pit mine
6	gravel pit
7	borrow pit
8	mine related structure (e.g. mill, cable tower, water tank etc.)
9	caved adit
10	caved shaft
11	quarry
12	well
13	oil well
14	oil and gas well
15	gas well
16	water-injection well
17	gas-injection well
18	dry hole
19	test hole
20	drill hole
21	junked hole
22	never drilled (hole/well)

MIN_NOTE Text note on mine and mine related feature (e.g. mine name, structure type, commodity mined etc.).

ID_CODE Unique feature identification number from NPS Geologic Resources Division (GRD) Abandoned Mineral Lands (AML) Database.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For a good number of mine and mine related features, placement of a digitized point is at the center of the point's graphical symbol. However, for some features, adits and caved adits, the point is placed at the intersection of lines that comprise the feature's graphic symbol. For area mines, placement of the digitized point should be in the approximated center of the area.
-

GEOLOGIC CROSS SECTION LINES (CODESEC)

Coverage consists of geologic cross section lines.

SPATIAL THEME (FILENAME): Geologic Cross Section Lines(CODESEC)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODESEC.AAT (ArcInfo), CODESEC.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODESEC_*	B (Binary)	4	5	-
CODESEC_ID*	B (Binary)	4	5	-
SEC_IDX	I (Integer)	6	6	-
SEC_ABV_O	C (Character)	6	6	-
SEC_ABV	C (Character)	6	6	-
SEC_FILE	C (Character)	60	60	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SEC_IDX A unique sequential identification number for each cross section line. The field values range from 1 to n, where n is the number of cross section lines in the coverage/theme.

SEC_ABV_O Original cross section abbreviation (i.e. A-A') on source map.

SEC_ABV Cross section abbreviation (i.e. A-A') on compiled NPS unit digital geologic map.

SEC_FILE Cross section graphic (.jpg) directory path and 8.3 file name (root:\code\data\nrdata\geology\gis\graphics\map series number-cross section letter.jpg, ex. c:\dino\data\nrdata\geology\gis\graphics\i584a.jpg). The cross section graphic can be viewed using the NPS ArcView 3.X Theme Manager and a Visual Basic (VB) graphics viewer program. The SEC_FILE value is 'passed' to the graphics viewer program via a Theme Manager tool. The 'passed' SEC_FILE value then directs to the graphics viewer program to the directory path and file name of the selected cross section image.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF

tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

GEOLOGIC ASH UNITS (CODEASH)

Coverage consists of area volcanic ashfall, pyroclastic and surficial flow units that overly one or more geologic units (CODEGLG) polygons. These units are often not coincidental with area geologic (CODEGLG) units (i.e. contacts that define these units are typically not coincidental with area geologic contacts).

SPATIAL THEME (FILENAME): Volcanic Ash Units (CODEASH)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEASH.PAT (ArcInfo), CODEASH.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEASH_*	B (Binary)	4	5	-
CODEASH_ID*	B (Binary)	4	5	-
ASH_IDX	I (Integer)	6	6	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

ASH_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

GLG_SYM Age-lithology symbol/code of ash unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below). A value of 'NA' is assigned to areas within the coverage/theme that are not areas of volcanic ash (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

USGS_SYM USGS age-lithology symbol/code of ash unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above). A value of 'NA' is assigned to areas within the coverage/theme that are not areas of volcanic ash (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GLG_AGE_NO Number used to age-sort geologic units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 0 is assigned to polygons within the coverage/theme that are not areas of volcanic ash (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEASH coverage/theme that are bounded by one or more geologic ash polygons and are not geologic ash units (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.
-

GEOLOGIC ASH CONTACTS/BOUNDARIES (CODEASH/CODEASHA)

Coverage consists of volcanic ashfall, pyroclastic and flow unit contact/boundary arcs. See the area volcanic ashfall, pyroclastic and surficial flow units coverage (CODEASH) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Geologic Ash Unit Boundaries/Contacts (CODEASH/ArcInfo), (CODEASHA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEASH.AAT (ArcInfo), CODEASHA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEASHA_*	B (Binary)	4	5	-
CODEASHA_ID*	B (Binary)	4	5	-
ASHCNT_IDX	I (Integer)	6	6	-
ASHCNT_TYP	I (Integer)	2	2	-
FLTCNT	C (Character)	1	1	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

ASHCNT_IDX A unique sequential identification number for each ash contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

ASHCNT_TYPE A code value that designates the positional accuracy and/or concealment of an ash contact/map boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

ASHCNT_TYP Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried
9	gradational

ASHCNT_TYP Code Value List (cont.)

10	quadrangle boundary
11	extent/map boundary
12	water/shoreline
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial approximate
16	subaqueous (inferred)

FLTCNT Designates ash contact arcs that are also fault arcs. Contact arc segments that are also fault arcs (FLTCNT = 'Y') are present in both the ash contact (CODEASH/CODEASHA) and fault (CODEFLT) themes.

FLTCNT Code List

Y	Yes, the contact <u>is</u> also a fault
N	No, the contact is <u>not</u> also a fault

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

- 1.) Contact/Fault Arcs in Multiple Themes: Ash contact arcs that are also fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are present in both the ash contact/boundaries (CODEASH/CODEASHA) and fault (CODEFLT) themes.
 - 2.) Contact/Fault Arc Directionality: Ash contact/fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.
-

METAMORPHIC GRADE BOUNDARIES (CODEMET)

Coverage consists of metamorphic grade boundaries.

SPATIAL THEME (FILENAME): Metamorphic Grade Boundaries (CODEMET)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEMET.AAT (ArcInfo), CODEMET.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEMET_*	B (Binary)	4	5	-
CODEMET_ID*	B (Binary)	4	5	-
MET_IDX	I (Integer)	6	6	-
MET_SEG_N	I (Integer)	3	3	-
MET_SEG_T	I (Integer)	2	2	-
MET_TYPE	I (Integer)	2	2	-
MET_LT	I (Integer)	3	3	-
MET_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MET_IDX A unique sequential identification number for each feature. A metamorphic grade boundary can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of metamorphic grade features in the coverage/theme.

MET_SEG_N A sequential number assigned to each arc segment of a metamorphic grade boundary. All arc segments of a metamorphic grade boundary must be continuous and have a common MET_IDX number. Segment numbers are assigned starting at one end of an arc. A value of 1 is assigned to one end of the metamorphic grade boundary arc. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that metamorphic grade boundary. A value of 0 may be assigned to all arcs if 'conditions' justify so.

MET_SEG_T A code value that designates the positional accuracy and/or concealment of a metamorphic grade boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

MET_SEG_T Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried

MET_TYPE A code value used to differentiate metamorphic grade boundary type. Refer to the geologic map legend for graphical representation of metamorphic grade boundaries as well as the accompanying map notes and/or report on fold types.

MET_TYPE Code Value List

1	metamorphic grade boundary
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MET_LT A code value for graphical line type representation of a metamorphic grade boundary arc segment. The code value is derived from the segment type (MET_SEG_T, see field description above) and metamorphic grade boundary type (MET_TYPE, see field description above). The code value is calculated by multiplying the MET_TYPE value by 10, then adding the MET_SEG_T value to the sum.

MET_LT Code Value List

11	metamorphic grade boundary, known or certain
12	metamorphic grade boundary, approximate
13	metamorphic grade boundary, concealed
14	metamorphic grade boundary, queried
15	metamorphic grade boundary, approximate, queried
16	metamorphic grade boundary, concealed, queried
17	metamorphic grade boundary, inferred
18	metamorphic grade boundary, inferred, queried

MET_NOTE Text notes and remarks on metamorphic grade boundary.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

LINEAR GLACIAL FEATURES (CODEMOR)

Coverage consists of glacial features mapped as linear features.

SPATIAL THEME (FILENAME): Linear Glacial Features (CODEMOR)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEMOR.AAT (ArcInfo), CODEMOR.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 18

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEMOR_*	B (Binary)	4	5	-
CODEMOR_ID*	B (Binary)	4	5	-
MOR_IDX	I (Integer)	6	6	-
MOR_SEG_N	I (Integer)	3	3	-
MOR_SEG_T	I (Integer)	2	2	-
MOR_TYPE	I (Integer)	2	2	-
MOR_LT	I (Integer)	4	4	-
MOR_NOTE	C (Character)	254	254	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MOR_IDX A unique sequential identification number for each feature. A linear glacial feature can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of linear glacial features in the coverage/theme.

MOR_SEG_N A sequential number assigned to each arc segment of a linear glacial feature. All arc segments of a linear glacial feature must be continuous and have a common MOR_IDX number.

Segment numbers are assigned starting at one end' of an arc. A value of 1 is assigned to one end of the linear glacial feature arc. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that linear glacial feature. A value of 0 may be assigned to all arcs if 'conditions' justify so.

MOR_SEG_T A code value that designates the positional accuracy and/or concealment of a linear glacial feature arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

MOR_SEG_T Code Value List

1	known or certain
3	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried

MOR_TYPE A code value used to differentiate linear glacial feature type. Refer to the geologic map legend for graphical representation of metamorphic grade boundaries as well as the accompanying map notes and/or report on fold types.

MOR_TYPE Code Value List

1	moraine crest
2	glacial movement direction line
3	ridge crest of fluted landform or drumlin
4	glacial meltwater channel
5	crevasse
6	end moraine
7	orientation of drumlinoid feature
8	prominent avalanche track
9	limit of ice extent/margin
10	esker
11	glacial terrace

MOR_LT A code value for graphical line type representation of a linear glacial feature arc segment. The code value is derived from the segment type (MOR_SEG_T, see field description above) and linear glacial feature type (MOR_TYPE, see field description above). The code value is calculated by multiplying the MOR_TYPE value by 10, then adding the MOR_SEG_T value to the sum.

MOR_LT Code Value List

11	moraine crest, known or certain
12	moraine crest, approximate
13	moraine crest, concealed
14	moraine crest, queried
15	moraine crest, approximate, queried
16	moraine crest, concealed, queried
17	moraine crest, inferred
18	moraine crest, inferred, queried
21	glacial movement direction line, known or certain

MOR_LT Code Value List (cont.)

22	glacial movement direction line, approximate
23	glacial movement direction line, concealed
24	glacial movement direction line, queried
25	glacial movement direction line, approximate, queried
26	glacial movement direction line, concealed, queried
27	glacial movement direction line, inferred
28	glacial movement direction line, inferred, queried
31	ridge crest of fluted landform or drumlin, known or certain
32	ridge crest of fluted landform or drumlin, approximate
33	ridge crest of fluted landform or drumlin, concealed
34	ridge crest of fluted landform or drumlin, queried
35	ridge crest of fluted landform or drumlin, approximate, queried
36	ridge crest of fluted landform or drumlin, concealed, queried
37	ridge crest of fluted landform or drumlin, inferred
38	ridge crest of fluted landform or drumlin, inferred, queried
41	glacial meltwater channel, known or certain
42	glacial meltwater channel, approximate
43	glacial meltwater channel, concealed
44	glacial meltwater channel, queried
45	glacial meltwater channel, approximate, queried
46	glacial meltwater channel, concealed, queried
47	glacial meltwater channel, inferred
48	glacial meltwater channel, inferred, queried
51	crevasse, known or certain
52	crevasse, approximate
53	crevasse, concealed
54	crevasse, queried
55	crevasse, approximate, queried
56	crevasse, concealed, queried
57	crevasse, inferred
58	crevasse, inferred, queried
61	end moraine, known or certain
62	end moraine, approximate
63	end moraine, concealed
64	end moraine, queried
65	end moraine, queried, approximate
66	end moraine, queried, concealed
67	end moraine, inferred
68	end moraine, inferred, queried
71	orientation of drumlinoid feature, known or certain
72	orientation of drumlinoid feature, approximate
73	orientation of drumlinoid feature, concealed
74	orientation of drumlinoid feature, queried
75	orientation of drumlinoid feature, approximate, queried
76	orientation of drumlinoid feature, concealed, queried
77	orientation of drumlinoid feature, inferred
78	orientation of drumlinoid feature, inferred, queried
81	prominent avalanche track, known or certain
82	prominent avalanche track, approximate
83	prominent avalanche track, concealed

MOR_LT Code Value List (cont.)

84	prominent avalanche track, queried
85	prominent avalanche track, approximate, queried
86	prominent avalanche track, concealed, queried
87	prominent avalanche track, inferred
88	prominent avalanche track, inferred, queried
91	limit of ice extent/margin, known or certain
92	limit of ice extent/margin, approximate
93	limit of ice extent/margin, concealed
94	limit of ice extent/margin, queried
95	limit of ice extent/margin, approximate, queried
96	limit of ice extent/margin, concealed, queried
97	limit of ice extent/margin, inferred
98	limit of ice extent/margin, inferred, queried
101	esker, known or certain
102	esker, approximate
103	esker, concealed
104	esker, queried
105	esker, approximate, queried
106	esker, concealed, queried
107	esker, inferred
108	esker, inferred, queried
111	glacial terrace, known or certain
112	glacial terrace, approximate
113	glacial terrace, concealed
114	glacial terrace, queried
115	glacial terrace, approximate, queried
116	glacial terrace, concealed, queried
117	glacial terrace, inferred
118	glacial terrace, inferred, queried

MOR_NOTE Text notes and remarks on linear glacial feature.

GLG_SYM Age-lithology symbol/code of geologic unit associated with linear glacial feature. Common to all arc segments with the same MOR_IDX number (see field description above). The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of volcanic unit associated with linear glacial feature. Common to all arc segments with the same MOR_IDX number (see field description above). The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s)

the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Glacial Feature Arc Directionality: Some glacial feature arcs may represent or depict directions of glacial ice movement (MOR_TYPE = 2), glacial meltwater channel flows (MOR_TYPE = 4) or prominent avalanche tracks (MOR_TYPE = 8). Arcs that represent directionality of movement or flow are to be captured starting at the 'up end' of the feature, as indicated on the source map. Thus, the starting (upstream) or from node (FNODE_) should be the 'starting point' of the arc. For arcs with a slope or down-direction, crevasse (MOR_TYPE = 5), the slope or down-direction should be on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the slope or down-direction should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.
-

JOINTS (CODEJLN)

Coverage consists of joints mapped as linear features.

SPATIAL THEME (FILENAME): Linear Joints (CODEJLN)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEJLN.AAT (ArcInfo), CODEJLN.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 14

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEJLN_*	B (Binary)	4	5	-
CODEJLN_ID*	B (Binary)	4	5	-
JLN_IDX	I (Integer)	6	6	-
JLN_SEG_N	I (Integer)	3	3	-
JLN_SEG_T	I (Integer)	2	2	-
JLN_TYPE	I (Integer)	2	2	-
JLN_LT	I (Integer)	4	4	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

JLN_IDX A unique sequential identification number for each feature. A linear joint feature can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of joint features in the coverage/theme.

JLN_SEG_N A sequential number assigned to each arc segment of a segmented joint. All arc segments of a joint must be continuous and have a common JLN_IDX number. Segment numbers are assigned starting at either end of the continuous joint. A value of 1 is assigned to the 'starting' arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that joint. A value of 0 may be assigned to all arcs if 'conditions' justify so.

JLN_SEG_T A code value that designates the positional accuracy and/or concealment of a joint arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

JLN_SEG_T Code Value List

- | | |
|---|------------------|
| 1 | known or certain |
| 2 | approximate |
| 3 | concealed |

JLN_SEG_T Code Value List (cont.)

4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried

JLN_TYPE A code value used to differentiate joint type, if denoted. Refer to the geologic map legend for graphical representation of joints as well as the accompanying map notes and/or report on jointing and joint types.

JLN_TYPE Code Value List

1	joint
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JLN_LT A code value for graphical line type representation of a joint arc segment. The code value is derived from the segment type (JLN_SEG_T, see field description above) and joint type (JLN_TYPE, see field description above). The code value is calculated by multiplying the JLN_TYPE value by 10, then adding the JLN_SEG_T value to the sum.

JLN_LT Code Value List

11	joint, known or certain
12	joint, approximate
13	joint, concealed
14	joint, queried
15	joint, approximate, queried
16	joint, concealed, queried
17	joint, inferred
18	joint, inferred, queried

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

GEOLOGIC CONTOURS and OTHER GEOLOGIC LINES (CODELN#)

Coverage consists of geologic contours and 'other' miscellaneous geologic line features.

SPATIAL THEME (FILENAME): Geologic Contours and Lines (CODELN#)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODELN#.AAT (ArcInfo), CODELN#.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 16

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODELN#_*	B (Binary)	4	5	-
CODELN#_ID*	B (Binary)	4	5	-
LN_IDX	I (Integer)	6	6	-
LN_SEG_N	I (Integer)	3	3	-
LN_SEG_T	I (Integer)	2	2	-
LN_TYPE	I (Integer)	2	2	-
LN_LT	I (Integer)	4	4	-
LN_ELEV_FT	I (Integer)	6	6	-
LN_ELEV_M	I (Integer)	6	6	-
LN_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

LN_IDX A unique sequential identification number for feature. A feature can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of features in the coverage/theme.

LN_SEG_N A sequential number assigned to each arc segment of a segmented continuous line. All arc segments of a continuous line must have a common LN#_IDX number. Segment numbers are assigned starting at either end of the arc. A value of 1 is assigned to the 'starting' arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that continuous line. A value of 0 may be assigned to all arcs if 'conditions' justify so.

LN_SEG_T A code value that designates the positional accuracy and/or concealment of an arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

LN_SEG_T Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried

LN_TYPE A code value used to differentiate line type. Refer to the geologic map legend for graphical representation of applicable geologic lines as well as the accompanying map notes and/or report.

LN_TYPE Code Value List

- 1 structure contour line
- 2 paleotopographic contour line
- 3 isopach line
- 4 unconformity
- 5 paleoshoreline
- 6 subsurface fold
- 7 subsurface fault
- 8 lineament
- 9 stratigraphic section line
- 10 escarpment
- 11 resistant bed
- 12 conspicuous bed
- 13 linear trend line
- 14 paleotopographic high
- 15 aeromagnetic gradient line
- 16 form line indicating general trend of bedding

LN_LT A code value for graphical line type representation of a line arc segment. The code value is derived from the segment type (LN_SEG_T, see field description above) and line type (LN_TYPE, see field description above). The code value is calculated by multiplying the LN_TYPE value by 10, then adding the LN_SEG_T value to the sum.

LN_LT Code Value List

- 11 structure contour line, known or certain
- 12 structure contour line, approximate
- 13 structure contour line, concealed
- 14 structure contour line, queried
- 15 structure contour line, approximate, queried
- 17 structure contour line, concealed, queried
- 18 structure contour line, inferred
- 19 structure contour line, inferred, queried
- 21 paleotopographic contour line, known or certain
- 22 paleotopographic contour line, approximate
- 23 paleotopographic contour line, concealed
- 24 paleotopographic contour line, queried
- 25 paleotopographic contour line, approximate, queried
- 26 paleotopographic contour line, concealed, queried

LN_LT Code Value List (cont.)

27	paleotopographic contour line, inferred
28	paleotopographic contour line, inferred, queried
31	isopach line, known or certain
32	isopach line, approximate
33	isopach line, concealed
34	isopach line, queried
35	isopach line, approximate, queried
36	isopach line, concealed, queried
37	isopach line, inferred
38	isopach line, inferred, queried
41	unconformity, known or certain
42	unconformity, approximate
43	unconformity, concealed
44	unconformity, queried
45	unconformity, approximate, queried
46	unconformity, concealed, queried
47	unconformity, inferred
48	unconformity, inferred, queried
51	paleoshoreline, known or certain
52	paleoshoreline, approximate
53	paleoshoreline, concealed
54	paleoshoreline, queried
55	paleoshoreline, approximate, queried
56	paleoshoreline, concealed, queried
57	paleoshoreline, inferred
58	paleoshoreline, inferred, queried
61	subsurface fold, known or certain
62	subsurface fold, approximate
64	subsurface fold, queried
65	subsurface fold, approximate, queried
67	subsurface fold, inferred
68	subsurface fold, inferred, queried
71	subsurface fault, known or certain
72	subsurface fault, approximate
74	subsurface fault, queried
75	subsurface fault, approximate, queried
77	subsurface fault, inferred
78	subsurface fault, inferred, queried
81	lineament, known or certain
82	lineament, approximate
83	lineament, concealed
84	lineament, queried
85	lineament, approximate, queried
86	lineament, concealed, queried
87	lineament, inferred
88	lineament, inferred, queried
91	stratigraphic section line, known or certain
92	stratigraphic section line, approximate
93	stratigraphic section line, concealed
95	stratigraphic section line, queried

LN_LT Code Value List (cont.)

96	stratigraphic section line, approximate, queried
96	stratigraphic section line, concealed, queried
97	stratigraphic section line, inferred
98	stratigraphic section line, inferred, queried
101	escarpment, known or certain
102	escarpment, approximate
103	escarpment, concealed
104	escarpment, queried
105	escarpment, approximate, queried
106	escarpment, concealed, queried
107	escarpment, inferred
108	escarpment, inferred, queried
111	resistant bed, known or certain
112	resistant bed, approximate
113	resistant bed, concealed
114	resistant bed, queried
115	resistant bed, approximate, queried
116	resistant bed, concealed, queried
117	resistant bed, inferred
118	resistant bed, inferred, queried
121	conspicuous bed, known or certain
122	conspicuous bed, approximate
123	conspicuous bed, concealed
124	conspicuous bed, queried
125	conspicuous bed, approximate, queried
126	conspicuous bed, concealed, queried
127	conspicuous bed, inferred
128	conspicuous bed, inferred, queried
131	linear trend line, known or certain
132	linear trend line, approximate
133	linear trend line, concealed
134	linear trend line, queried
135	linear trend line, approximate, queried
136	linear trend line, concealed, queried
137	linear trend line, inferred
138	linear trend line, inferred, queried
141	paleotopographic high, known or certain
142	paleotopographic high, approximate
143	paleotopographic high, concealed
144	paleotopographic high, queried
145	paleotopographic high, approximate, queried
146	paleotopographic high, concealed, queried
147	paleotopographic high, inferred
148	paleotopographic high, inferred, queried
151	aeromagnetic gradient line, known or certain
152	aeromagnetic gradient line, approximate
153	aeromagnetic gradient line, concealed
154	aeromagnetic gradient line, queried
155	aeromagnetic gradient line, approximate, queried
156	aeromagnetic gradient line, concealed, queried

LN_LT Code Value List (cont.)

157	aeromagnetic gradient line, inferred
158	aeromagnetic gradient line, inferred, queried
161	form line indicating general trend of bedding, known or certain
162	form line indicating general trend of bedding, approximate
163	form line indicating general trend of bedding, concealed
164	form line indicating general trend of bedding, queried
165	form line indicating general trend of bedding, approximate, queried
166	form line indicating general trend of bedding, concealed, queried
167	form line indicating general trend of bedding, inferred
168	form line indicating general trend of bedding, inferred, queried

LN_ELEV_FT Elevation of line in feet. Enter 99999 value if not applicable. (1 ft = 0.3048 m)

LN_ELEV_M Elevation of line in meters. Enter 99999 value if not applicable. (1 m = 3.2808 ft)

LN_NOTE Text notes and remarks on line.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Multiple LN# Themes: Dependent on geologic contour and 'other' line types present on the source map, more than one LN# coverage/theme may be required to capture all geologic line themes. # denotes a number assigned to a geologic contour or 'other' line coverage/theme name, starting with the number 1.
-

SENSITIVE POINT FEATURES (CODESPF)

Coverage consists of sensitive geologic features mapped as points.

SPATIAL THEME (FILENAME): Sensitive Geologic Feature Points (CODESPF)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODESPF.PAT (ArcInfo), CODESPF.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 9

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODESPF_*	B (Binary)	4	5	-
CODESPF_ID*	B (Binary)	4	5	-
SPF_IDX	I (Integer)	6	6	-
SPF_TYPE	I (Integer)	2	2	-
SPF_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SPF_IDX A unique sequential identification number for sensitive point features. The field values range from 1 to n, where n is the number of sensitive point features in the coverage/theme.

SPF_TYPE A code value used to indicate the type of sensitive points. Refer to the geologic map legend for graphical representation of sensitive point features.

SPF_TYPE Code Value List

1	cave
2	hollow
3	skylight
4	tunnel

SPF_NOTE Text note on sensitive point feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For many sensitive point feature localities, placement of a digitized point is at the center of the feature's graphical symbol. For sensitive features that do not have a defined graphical symbol center, often non-symmetrical graphic symbols, placement of the digitized point should be at the intersection of symbol lines, if present.

UNIQUE GEOLOGIC POINT FEATURES (CODEUPF)

Coverage consists of unique geologic features mapped as points.

SPATIAL THEME (FILENAME): Unique Geologic Feature Points (CODEUPF)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEUPF.PAT (ArcInfo), CODEUPF.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 9

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEUPF_*	B (Binary)	4	5	-
CODEUPF_ID*	B (Binary)	4	5	-
UPF_IDX	I (Integer)	6	6	-
UPF_TYPE	I (Integer)	2	2	-
UPF_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

UPF_IDX A unique sequential identification number for unique point features. The field values range from 1 to n, where n is the number of unique point features in the coverage/theme.

UPF_TYPE A code value used to indicate the type of unique points. Refer to the geologic map legend for graphical representation of unique point features.

UPF_TYPE Code Value List

- 1 natural arch
- 2 natural bridge
- 3 rock/boulder
- 4 natural window
- 5 cairn
- 6 collapse structure/feature
- 7 breccia pipe
- 8 coal outcrop
- 9 clinker rock locality

UPF_NOTE Text note on unique point feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For many unique point feature localities, placement of a digitized point is at the center of the feature's graphical symbol. For unique features that do not have a defined graphical symbol center, often non-symmetrical graphic symbols, placement of the digitized point should be at the intersection of symbol lines, if present.
-

SURFICIAL GEOLOGIC UNITS (CODESUR)

Coverage consists of surficial (i.e. unconsolidated) geologic units. Surficial deposits are typically captured in the area geologic units (CODEGLG) coverage, however, if concealed and/or inferred contacts are present on the source map (that define or constrain the extent of units beneath the surficial units, i.e. bedrock units), then these area surficial units (and the contacts that define them) can be placed into CODESUR/CODESURA coverage. This creates an area geologic units and contacts coverage (CODEGLG/CODEGLGA) consisting of bedrock units, and an area surficial units and contacts coverage (CODESUR/CODESURA).

SPATIAL THEME (FILENAME): Surficial Geologic Units (CODESUR)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODESUR.PAT (ArcInfo), CODESUR.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODESUR_*	B (Binary)	4	5	-
CODESUR_ID*	B (Binary)	4	5	-
SUR_IDX	I (Integer)	6	6	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SUR_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

GLG_SYM Age-lithology symbol/code of surficial geologic unit. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below). A value of 'NA' is assigned to polygons that are not areas of surficial geologic units (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

USGS_SYM USGS age-lithology symbol/code of surficial geologic unit. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above). A value of 'NA' is assigned to polygons that are not areas of surficial geologic units (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GLG_AGE_NO Number used to age-sort geologic units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit

geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 0 is assigned to polygons that are not areas of surficial geologic units (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. surficial geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODESUR coverage/theme that are bounded by one or more surficial geologic unit polygons and are not surficial geologic units (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA', and a GLG_AGE_NO field (see field description above) value of 0.

SURFICIAL GEOLOGIC CONTACTS/BOUNDARIES (CODESUR/CODESURA)

Coverage consists of surficial geologic contact arcs and map boundary. See the area surficial geologic units coverage (CODESUR) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Surficial Geologic Unit Boundaries/Contacts
(CODESUR/ArcInfo), (CODESURA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODESUR.AAT (ArcInfo), CODESURA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODESURA_*	B (Binary)	4	5	-
CODESURA_ID*	B (Binary)	4	5	-
SURCNT_IDX	I (Integer)	6	6	-
SURCNT_TYP	I (Integer)	2	2	-
FLTCNT	C (Character)	1	1	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SURCNT_IDX A unique sequential identification number for each surficial contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

SURCNT_TYPE A code value that designates the positional accuracy and/or concealment of a surficial contact/map boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

SURCNT_TYP Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried
9	gradational
10	quadrangle boundary

SURCNT_TYP Code Value List (cont.)

11	extent/map boundary
12	water/shoreline
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial approximate
16	subaqueous (inferred)

FLTCNT Designates surficial geologic contact arcs that are also fault arcs. Contact arc segments that are also fault arcs (FLTCNT = 'Y') are present in both the surficial geologic contact (CODESUR/CODESURA) and fault (CODEFLT) themes.

FLTCNT Code List

Y	Yes, the contact <u>is</u> also a fault
N	No, the contact is <u>not</u> also a fault

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

- 1.) Contact/Fault Arcs in Multiple Themes: Contact arcs that are also fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are present in both the geologic contact/boundaries (CODESUR/CODESURA) and fault (CODEFLT) themes.
- 2.) Contact/Fault Arc Directionality: Contact/fault arcs (FLTCNT = 'Y', see FLTCNT field description above) are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

MEASURED UNIT THICKNESS (CODEMUT)

Coverage consists of measured unit thickness point and type localities.

SPATIAL THEME (FILENAME): Measured Unit Thickness (CODEMUT)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEMUT.PAT (ArcInfo), CODEMUT.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 14

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEMUT_*	B (Binary)	4	5	-
CODEMUT_ID*	B (Binary)	4	5	-
MUT_IDX	I (Integer)	6	6	-
MUT_TYPE	I (Integer)	2	2	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
MUT_UT_FT	N (Number)	7	7	3
MUT_UT_M	N (Number)	7	7	3
MUT_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MUT_IDX A unique sequential identification number for each measurement locality. The field values range from 1 to n, where n is the number of measured unit thickness localities.

MUT_TYPE A code value used to indicate the type of measured unit feature.

MUT_TYPE Code Value List

- 1 coal bed thickness
- 2 volcanic ash bed/layer thickness
- 3 ore bode thickness
- 4 type locality

GLG_SYM Age-lithology symbol/code of geologic unit measured unit point feature is located within. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below).

USGS_SYM USGS age-lithology symbol/code of geologic unit measured unit point feature is located within. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above).

GLG_AGE_NO Number used to age-sort geologic map units, from youngest (low) to oldest (high). Values assigned to each point geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

MUT_UT_FT Thickness of unit in feet. (1 ft = 0.3048 m)

MUT_UT_M Thickness of unit in meters. (1 m = 3.2808 ft)

MUT_NOTE Text note on measurement/unit.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For measured unit thickness localities, placement of a digitized point is at the center of the localities graphical symbol.
-

MINE AREA FEATURES (CODEMAF)

Coverage consists of mine features mapped as area features.

SPATIAL THEME (FILENAME): Mine Area Features (CODEMAF)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEMAF.PAT (ArcInfo), CODEMAF.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEMAF_*	B (Binary)	4	5	-
CODEMAF_ID*	B (Binary)	4	5	-
MAF_IDX	I (Integer)	6	6	-
MAF_TYPE	I (Integer)	3	3	-
MAF_NOTE	C (Character)	254	254	-
ID_CODE	C (Character)	50	50	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MAF_IDX A unique sequential identification number for mine and mine related area features. The field values range from 1 to n, where n is the number of mine and mine related area features in the coverage/theme.

MAF_TYPE A code value used to indicate the type of mine or mine related area feature. Refer to the geologic map legend for graphical representation of mine and mine related area features.

MAF_TYPE Code Value List

- | | |
|---|----------------|
| 1 | area mine |
| 2 | gravel pit |
| 3 | borrow pit |
| 4 | tailings pile |
| 5 | tailings pond |
| 6 | settling pond |
| 7 | leaching pond |
| 8 | evaporite pond |

MAF_NOTE Text note on mine and mine related area feature (e.g. mine name, structure type, commodity mined etc.).

ID_CODE Unique feature identification number from NPS Geologic Resources Division (GRD) Abandoned Mineral Lands (AML) Database.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

MINE AREA FEATURES BOUNDARIES (CODEMAF/CODEMAFA)

Coverage consists of area mine feature boundaries. See the area mine feature coverage (CODEMAF) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Area Mine Boundaries (CODESUR/ArcInfo),
(CODESURA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEMAF.AAT (ArcInfo), CODEMAFA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEMAF_*	B (Binary)	4	5	-
CODEMAFA_ID*	B (Binary)	4	5	-
MAFCNT_IDX	I (Integer)	6	6	-
MAFCNT_TYP	I (Integer)	2	2	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MAFCNT_IDX A unique sequential identification number for each boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

MAFCNT_TYPE A code value that designates the positional accuracy and/or concealment of a boundary arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

MAFCNT_TYP Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate and queried
6	concealed, queried
7	inferred
8	inferred, queried
9	gradational
10	quadrangle boundary
11	map boundary
12	water boundary
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial approximate
16	subaqueous (inferred)

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

None.

SEISMIC DATA POINTS (CODESMC)

Coverage consists of seismic data point localities.

SPATIAL THEME (FILENAME): Seismic Point Data (CODESMC)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODESMC.PAT (ArcInfo), CODESMC.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 14

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODESMC_*	B (Binary)	4	5	-
CODESMC_ID*	B (Binary)	4	5	-
SMC_IDX	I (Integer)	6	6	-
SMC_TYPE	I (Integer)	2	2	-
SMC_MAG	N (Number)	6	6	3
SMC_DEPTH	N (Number)	6	6	3
SMC_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SMC_IDX A unique sequential identification number for each measurement locality. The field values range from 1 to n, where n is the number of localities.

SMC_TYPE A code value used to indicate the type of seismic feature.

SMC_TYPE

- | | |
|---|---------------------------------|
| 1 | earthquake epicenter |
| 2 | earthquake hypocenter |
| 3 | pseudotachylyte sample locality |

SMC_MAG Magnitude of seismic event. 999.999 if not available or applicable.

SMC_DEPTH Depth of seismic event, if known. 999.999 if not available or applicable.

SMC_NOTE Text note on seismic feature (e.g. date of activity, magnitude scale, type of activity).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s)

the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

SAMPLE LOCALITY POINTS (CODESAM)

Coverage consists of point localities where samples were collected and/or tested.

SPATIAL THEME (FILENAME): Sample Locality Points (CODESAM)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODESAM.PAT (ArcInfo), CODESAM.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 9

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODESAM_*	B (Binary)	4	5	-
CODESAM_ID*	B (Binary)	4	5	-
SAM_IDX	I (Integer)	6	6	-
SAM_TYPE	I (Integer)	2	2	-
SAM_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

SAM_IDX A unique sequential identification number for each measurement locality. The field values range from 1 to n, where n is the number of localities.

SAM_TYPE A code value used to indicate the type of sample locality.

SAM_TYPE

- 1 mineralogical/chemical sample
- 2 rock strength test sample
- 3 assay sample
- 4 special interest sample (e.g. petrological, cataclacite, mylonite)
- 5 gemstone sample
- 6 mine drainage sample

SAM_NOTE Text note on sample locality and/or sample taken and/or tested (e.g. age-date of sample, mineralogical/chemical composition, assay values, test results).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

None.

DEFORMATION ZONES (CODEDEF)

Coverage consists of area deformation, fault, shear and/or mylonite zones. These area features and the contacts/boundaries that delineate them are often captured in the area geologic units and contacts (CODEGLG/CODEGLGA) coverage as a geologic unit and contact. However, if these area features and their contacts/boundaries are not constrained as an area feature in the geologic units and contacts coverage (i.e. these features are not coincidental with area geologic units and contacts, but instead cross, cut or transcend more than one unit, and/or are simply within a geologic unit, and not mapped as a geologic unit), then these area features and their contacts/boundaries should be captured in this coverage.

SPATIAL THEME (FILENAME): Deformation Zones (CODEDEF)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEDEF.PAT (ArcInfo), CODEDEF.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 12

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEDEF_*	B (Binary)	4	5	-
CODEDEF_ID*	B (Binary)	4	5	-
DEF_IDX	I (Integer)	6	6	-
DEF_TYPE	I (Integer)	3	3	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
DEF_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DEF_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

DEF_TYPE A code value used to indicate the type of deformation zone.

DEF_TYPE

- 1 fault zone
- 2 shear zone
- 3 mylonite zone
- 4 ductile deformation zone

GLG_SYM Age-lithology symbol/code of the deformation zone. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below). A value of 'NA' is assigned to

areas within the coverage/theme that are not deformation zones (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

USGS_SYM USGS age-lithology symbol/code of the deformation zone. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above). A value of 'NA' is assigned to areas within the coverage/theme that are not deformation zones (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GLG_AGE_NO Number used to age-sort geologic units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 0 is assigned to polygons within the coverage/theme that are not areas of volcanic ash (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

DEF_NOTE Notes and remarks on deformation zone (e.g. deformation zone name).

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEDEF coverage/theme that are bounded by one or more deformation zone polygons and are not deformation zones (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.

DEFORMATION ZONE CONTACTS/BOUNDARIES (CODEDEF/CODEDEFA)

Coverage consists of deformation zone contact/boundary arcs. See the area deformation feature coverage (CODEDEF) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Deformation Zone Boundaries/Contacts (CODEDEF/ArcInfo),
(CODEDEFA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEDEFAAT (ArcInfo), CODEDEFA.DBF (ArcView 3.X)
TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)
NUMBER OF ATTRIBUTE FIELDS: 11

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEDEFA_*	B (Binary)	4	5	-
CODEDEFA_ID*	B (Binary)	4	5	-
DEFCNT_IDX	I (Integer)	6	6	-
DEFCNT_TYP	I (Integer)	2	2	-
DEFCNT	C (Character)	1	1	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

DEFCNT_IDX A unique sequential identification number for each contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

DEFCNT_TYPE A code value that designates the positional accuracy and/or concealment of deformation boundary/contact arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

DEFCNT_TYP Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried
- 9 gradational
- 10 quadrangle boundary
- 11 extent/map boundary
- 12 water/shoreline
- 13 water/shoreline, approximate
- 14 ice/glacial
- 15 ice/glacial approximate
- 16 subaqueous (inferred)

DEFCNT Designates deformation zone arcs that are also geologic unit (contact) arcs. Deformation zone arc segments that are also contact arcs are also present in either the area geologic units (CODEGLG/CODEGLGA), linear geologic units (CODEGLN), area ash units (CODEASH/CODEASHA) and/or surficial geologic contact (CODESUR/CODESURA) coverages/themes (see FLTCNT field in CODEGLG, CODEGLN, CODEASH and/or CODESUR coverage/themes).

DEFCNT Code List

Y	Yes, the boundary arc <u>is</u> also a contact
N	No, the boundary arc is <u>not</u> also a contact

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

- 1.) Contact/Fault Arcs in Multiple Themes: Deformation zone arcs that are also geologic contact arcs (DEFCNT = 'Y', see DEFCNT field description above) are also present in either the area geologic units (CODEGLG/CODEGLGA), linear geologic units (CODEGLN), area ash units (CODEASH/CODEASHA) and/or surficial geologic contact (CODESUR/CODESURA) coverages/themes.
- 2.) Contact/Fault Arc Directionality: Deformation zone arcs are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown fault-block should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

LINEAR HAZARD FEATURES (CODEHZL)

Coverage consists of hazard features mapped as linear features.

SPATIAL THEME (FILENAME): Linear Hazard Features (CODEHZL)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEHZL.AAT (ArcInfo), CODEHZL.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEHZL_*	B (Binary)	4	5	-
CODEHZL_ID*	B (Binary)	4	5	-
HZL_IDX	I (Integer)	6	6	-
HZL_SEG_N	I (Integer)	3	3	-
HZL_SEG_T	I (Integer)	2	2	-
HZL_TYPE	I (Integer)	2	2	-
HZL_LT	I (Integer)	4	4	-
HZL_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

HZL_IDX A unique sequential identification number for each linear hazard feature. A linear hazard feature can be comprised of one or more continuous arc segments. The field values range from 1 to n, where n is the number of linear hazard features in the coverage/theme.

HZL_SEG_N A sequential number assigned to each arc segment of a segmented linear hazard feature. All arc segments of a linear hazard feature must be continuous and have a common HZL_IDX number. Segment numbers are assigned starting at either end of the continuous linear hazard feature. A value of 1 is assigned to the ‘starting’ arc segment. The next adjacent arc is assigned a value of 2 and so on to the nth arc segment, where n is the total number of arc segments that comprise that linear hazard feature. A value of 0 may be assigned to all arcs if ‘conditions’ justify so.

HZL_SEG_T A code value that designates the positional accuracy and/or concealment of a linear hazard feature arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

HZL_SEG_T Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried

HZL_TYPE A code value used to differentiate linear hazard feature type, if denoted. Refer to the geologic map legend for graphical representation of linear hazard features as well as the accompanying map notes and/or report on hazards and linear hazard feature types.

HZL_TYPE Code Value List

- | | |
|---|---------------------------------|
| 1 | sinkhole |
| 2 | landslide |
| 3 | height reached by mudflow event |

HZL_LT A code value for graphical line type representation of a linear hazard arc segment. The code value is derived from the segment type (HZL_SEG_T, see field description above) and linear hazard feature type (HZL_TYPE, see field description above). The code value is calculated by multiplying the HZL_TYPE value by 10, then adding the HZL_SEG_T value to the sum.

HZL_LT Code Value List

- | | |
|----|---|
| 11 | sinkhole, known or certain |
| 12 | sinkhole, approximate |
| 13 | sinkhole, concealed |
| 14 | sinkhole, queried |
| 15 | sinkhole, approximate, queried |
| 16 | sinkhole, concealed, queried |
| 17 | sinkhole, inferred |
| 18 | sinkhole, inferred, queried |
| 21 | landslide, known or certain |
| 22 | landslide, approximate |
| 23 | landslide, concealed |
| 24 | landslide, queried |
| 25 | landslide, approximate, queried |
| 26 | landslide, concealed, queried |
| 27 | landslide, inferred |
| 28 | landslide, inferred, queried |
| 31 | height reached by mudflow event, known or certain |
| 32 | height reached by mudflow event, approximate |
| 33 | height reached by mudflow event, concealed |
| 34 | height reached by mudflow event, queried |
| 35 | height reached by mudflow event, approximate, queried |
| 36 | height reached by mudflow event, concealed, queried |
| 37 | height reached by mudflow event, inferred |
| 38 | height reached by mudflow event, inferred, queried |

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or

additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool. Each digital map typically typically has one Help File (CODEHLP.HLP) with information for all coverages/themes produced from the source map as per the NPS GRE Geology-GIS Coverage/Shapefile Data Model.

SPECIAL COVERAGE GUIDELINES:

- 1.) Arc Directionality: Linear hazard feature arcs are captured with the down-thrown fault block, if applicable, on the 'right side' of the arc. The 'right' and 'left' sides of an arc are determined from 'starting' at the arc's 'from node' (FNODE_) and moving to the arc's 'to node' (TNODE_). Thus, the down-thrown area of a sinkhole should be the arc segment's RPOLY_. See Standard ArcInfo Arc Attribute Fields section for FNODE_, TNODE_ and RPOLY_ definitions/descriptions.

HAZARD POINT FEATURES (CODEHWP)

Coverage consists of hazard features mapped as point localities and/or features.

SPATIAL THEME (FILENAME): Hazard Point Features (CODEHWP)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEHWP.PAT (ArcInfo), CODEHWP.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 9

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEHWP_*	B (Binary)	4	5	-
CODEUPF_ID*	B (Binary)	4	5	-
HWP_IDX	I (Integer)	6	6	-
HWP_TYPE	I (Integer)	2	2	-
HWP_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

HWP_IDX A unique sequential identification number for hazard point features. The field values range from 1 to n, where n is the number of mine and hazard point features in the coverage/theme.

HWP_TYPE A code value used to indicate the type of hazard point features. Refer to the geologic map legend for graphical representation of hazard point features.

HZP_TYPE Code Value List

- | | |
|---|----------------------------|
| 1 | small mass movement |
| 2 | sink hole |
| 3 | collapse structure/feature |

HZP_NOTE Text note on hazard point feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Point Placement: For many hazard point features placement of a digitized point is at the center of the feature's graphical symbol. For hazard point features that do not have a defined graphical symbol center, often non-symmetrical graphic symbols, placement of the digitized point should be at the intersection of symbol lines, if present.
-

AREA GLACIAL FEATURES (CODEAGF)

Coverage consists of area glacial features. These features are typically not mapped as geologic units but features.

SPATIAL THEME (FILENAME): Area Glacial Features (CODEAGF)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEAGF.PAT (ArcInfo), CODEAGF.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 12

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEAGF_*	B (Binary)	4	5	-
CODEAGF_ID*	B (Binary)	4	5	-
AGF_IDX	I (Integer)	6	6	-
AGF_TYPE	I (Integer)	3	3	-
GLG_SYM	C (Character)	12	12	-
USGS_SYM	C (Character)	12	12	-
GLG_AGE_NO	N (Number)	8	8	4
AGF_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

AGF_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

AGF_TYPE A code value used to indicate the type of deformation zone.

AGF_TYPE

- 1 area of knob-and-kettle topography
- 2 rock glacier
- 3 area of ice extent
- 4 area morainal crest

GLG_SYM Age-lithology symbol/code of the area glacial feature. The code usually is identical to the USGS_SYM age-lithology symbol/code (see field description below). A value of 'NA' is assigned to areas within the coverage/theme that are not area glacial features (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

USGS_SYM USGS age-lithology symbol/code of the area glacial feature. The code usually is identical to the GLG_SYM age-lithology symbol/code (see field description above). A value of 'NA' is assigned

to areas within the coverage/theme that are not area glacial features (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

GLG_AGE_NO Number used to age-sort geologic units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions. A value of 0 is assigned to polygons within the coverage/theme that are not areas of volcanic ash (i.e. doughnut holes, see SPECIAL COVERAGE GUIDELINES #1 below).

AGF_NOTE Notes and remarks on area glacial feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEAGF coverage/theme that are bounded by one or more area glacial feature polygons and are not area glacial features (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.

AREA GLACIAL FEATURE CONTACTS/BOUNDARIES (CODEAGF/CODEAGFA)

Coverage consists of area glacial feature contact/boundary arcs. See the area glacial feature coverage (CODEAGF) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Area Glacial Feature Boundaries/Contacts (CODEAGF/ArcInfo), (CODEAGFA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEAGFAAT (ArcInfo), CODEAGFA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEAGFA_*	B (Binary)	4	5	-
CODEAGFA_ID*	B (Binary)	4	5	-
AGFCNT_IDX	I (Integer)	6	6	-
AGFCNT_TYP	I (Integer)	2	2	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

AGFCNT_IDX A unique sequential identification number for each contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

AGFCNT_TYPE A code value that designates the positional accuracy and/or concealment of area glacial boundary/contact arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

AGFCNT_TYP Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried
- 9 gradational
- 10 quadrangle boundary
- 11 extent/map boundary
- 12 water/shoreline
- 13 water/shoreline, approximate
- 14 ice/glacial
- 15 ice/glacial approximate
- 16 subaqueous (inferred)

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map

projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

None.

AREA HAZARD FEATURES (CODEHZA)

Coverage consists of area hazard features.

SPATIAL THEME (FILENAME): Area Hazard Features (CODEHZA)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEHZA.PAT (ArcInfo), CODEHZA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 12

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEHZA_*	B (Binary)	4	5	-
CODEHZA_ID*	B (Binary)	4	5	-
HZA_IDX	I (Integer)	6	6	-
HZA_TYPE	I (Integer)	3	3	-
HZA_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

HZA_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

HZA_TYPE A code value used to indicate the type of area hazard feature.

HZA_TYPE

1 area of gas seeps

HZA_NOTE Notes and remarks on area hazard feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEHZA coverage/theme that are bounded by one or more area hazard feature polygons and are not area hazard features (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.
-

AREA HAZARD FEATURE CONTACTS/BOUNDARIES (CODEHZA/CODEHZAA)

Coverage consists of area hazard feature contact/boundary arcs. See the area hazard feature coverage (CODEHAZ) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Area Hazard Feature Boundaries/Contacts (CODEHZA/ArcInfo), (CODEHZAA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEHZAAAT (ArcInfo), CODEHZAA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEHZAA_*	B (Binary)	4	5	-
CODEHZAA_ID*	B (Binary)	4	5	-
HZACNT_IDX	I (Integer)	6	6	-
HZACNT_TYP	I (Integer)	2	2	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

HZACNT_IDX A unique sequential identification number for each contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

HZACNT_TYPE A code value that designates the positional accuracy and/or concealment of area hazard boundary/contact arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

HZACNT_TYP Code Value List

1	known or certain
2	approximate
3	concealed
4	queried
5	approximate, queried
6	concealed, queried
7	inferred
8	inferred, queried
9	gradational
10	quadrangle boundary
11	extent/map boundary

HZACNT_TYP Code Value List (cont.)

12	water/shoreline
13	water/shoreline, approximate
14	ice/glacial
15	ice/glacial approximate
16	subaqueous (inferred)

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INFO (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

None.

METAMORPHIC ALTERATION AREA FEATURES (CODEMAA)

Coverage consists of metamorphic alteration areas and zones.

SPATIAL THEME (FILENAME): Metamorphic Alteration Areas (CODEMAA)

THEME DESCRIPTION: Polygon and Arc/line coverage(s)

TABLE COVERAGE/FILE NAME: CODEMAA.PAT (ArcInfo), CODEMAA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 12

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEMAA_*	B (Binary)	4	5	-
CODEMAA_ID*	B (Binary)	4	5	-
MAA_IDX	I (Integer)	6	6	-
MAA_TYPE	I (Integer)	3	3	-
MAA_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Polygon Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MAA_IDX A unique sequential identification number for each polygon. The field values range from 1 to n, where n is the number of polygons in the coverage/theme.

MAA_TYPE A code value used to indicate the type of metamorphic alteration area feature.

MAA_TYPE

- | | |
|---|---------------------------------|
| 1 | area of hydrothermal alteration |
| 2 | area of contact metamorphism |

MAA_NOTE Notes and remarks on metamorphic alteration area feature.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 1.) Non-Applicable Polygons (Doughnut Holes): Polygons within the CODEMAA coverage/theme that are bounded by one or more metamorphic alteration area feature polygons and are not metamorphic alteration area features (i.e. doughnut holes) are assigned a GLG_SYM, USGS_SYM and HELP_ID field (see field descriptions above) value of 'NA' and a GLG_AGE_NO field (see field description above) value of 0.
-

**METAMORPHIC ALTERATION AREA FEATURE CONTACTS/BOUNDARIES
(CODEMAA/CODEMAAA)**

Coverage consists of metamorphic alteration area and zone feature contact/boundary arcs. See the area metamorphic and alteration zone feature coverage (CODEMAA) for additional information concerning this coverage.

SPATIAL THEME (FILENAME): Metamorphic Alteration Area Feature Boundaries/Contacts
(CODEMAA/ArcInfo), (CODEMAAA/ArcView 3.X)

THEME DESCRIPTION: Arc/line coverage

TABLE COVERAGE/FILE NAME: CODEMAAAAT (ArcInfo), CODEMAAA.DBF (ArcView 3.X)

TABLE FORMAT: INFO .AAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 10

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
FNODE_*	B (Binary)	4	5	-
TNODE_*	B (Binary)	4	5	-
LPOLY_*	B (Binary)	4	5	-
RPOLY_*	B (Binary)	4	5	-
LENGTH*	F (Float)	4	18	5
CODEMAAA_*	B (Binary)	4	5	-
CODEMAAA_ID*	B (Binary)	4	5	-
MAACNT_IDX	I (Integer)	6	6	-
MAACNT_TYP	I (Integer)	2	2	-
GMAP_ID	I (Integer)	6	6	-

* See Standard ArcInfo Arc Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

MAACNT_IDX A unique sequential identification number for each contact/map boundary arc. The field values range from 1 to n, where n is the number of arcs in the coverage/theme.

MAACNT_TYPE A code value that designates the positional accuracy and/or concealment of a metamorphic alteration area feature boundary/contact arc. Refer to the geologic map legend for graphical representation of line accuracy and concealment.

MAACNT_TYP Code Value List

- 1 known or certain
- 2 approximate
- 3 concealed
- 4 queried
- 5 approximate, queried
- 6 concealed, queried
- 7 inferred
- 8 inferred, queried
- 9 gradational

- 10 quadrangle boundary
- 11 extent/map boundary
- 12 water/shoreline
- 13 water/shoreline, approximate
- 14 ice/glacial
- 15 ice/glacial approximate
- 16 subaqueous (inferred)

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

SPECIAL COVERAGE GUIDELINES:

None.

GLACIAL FEATURE POINTS (CODEGFP)

Coverage consists of glacial features mapped as point localities.

SPATIAL THEME (FILENAME): Glacial Feature Points (CODEGFP)

THEME DESCRIPTION: Point coverage

TABLE COVERAGE/FILE NAME: CODEGFP.PAT (ArcInfo), CODEGFP.DBF (ArcView 3.X)

TABLE FORMAT: INFO .PAT (ArcInfo), dBase IV .DBF (ArcView 3.X)

NUMBER OF ATTRIBUTE FIELDS: 9

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
AREA*	B (Binary)	8	18	5
PERIMETER*	B (Binary)	8	18	5
CODEGFP_*	B (Binary)	4	5	-
CODEGFP_ID*	B (Binary)	4	5	-
GFP_IDX	I (Integer)	6	6	-
GFP_TYPE	I (Integer)	2	2	-
GFP_NOTE	C (Character)	254	254	-
GMAP_ID	I (Integer)	6	6	-
HELP_ID	C (Character)	12	12	-

* See Standard ArcInfo Point Attribute Fields.

ATTRIBUTE FIELD DESCRIPTIONS:

GFP_IDX A unique sequential identification number for glacial feature point. The field values range from 1 to n, where n is the number of glacial feature points in the coverage/theme.

GFP_TYPE A code value used to indicate the type of glacial feature point. Refer to the geologic map legend for graphical representation of glacial feature points.

GFP_TYPE Code Value List

- 1 glacial erratic
- 2 glacial erratic with pedestal

GFP_NOTE Text note on glacial feature point.

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

HELP_ID A text field used to establish a connection to a Windows Help File to display textual and/or graphical information, information derived from source map notes, legend, figures, reports and/or additional sources. Information presented relates to either a specific map feature, a class or group of map features (i.e. geologic units), and/or the coverage/theme. The HELP_ID 'variable' is 'passed' to the Help File when a map feature is 'selected' using a NPS Theme Manager tool.

SPECIAL COVERAGE GUIDELINES:

- 2.) Point Placement: For many glacial feature point localities, placement of a digitized point is at the center of the feature's graphical symbol. For glacial feature points that do not have a defined graphical symbol center, often non-symmetrical graphic symbols, placement of the digitized point should be at the intersection of symbol lines, if present.

Additional Themes

Other themes, derived from new GRE digital map projects, are likely to follow.

Accessory Data Files

Additional data on unit lithology and source map information are included in two look-up tables that are related to map coverages through a primary or secondary key field.

TABLE COVERAGE/FILE NAME: CODEGLG1.INF (ArcInfo), CODEGLG1.DBF (ArcView 3.X)

TABLE FORMAT: INFO table (ArcInfo), dBase IV (ArcView 3.X)

NUMBER OF FIELDS: 15

ATTRIBUTE FIELD DEFINITIONS:

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
GLG_SYM ⁽¹⁾	C (Character)	12	12	-
GLG_NAME	C (Character)	100	100	-
GLG_FM	C (Character)	100	100	-
GLG_MBR	C (Character)	100	100	-
G_REL_AGE	C (Character)	5	5	-
G_SSCR_TXT	C (Character)	6	6	-
GLG_AGE_NO ⁽²⁾	N (Number)	7	7	4
G_AGE_TXT	C (Character)	50	50	-
G_AGE_PER	C (Character)	100	100	-
G_MJ_LITH	C (Character)	3	3	-
G_LITH_ID	I (Integer)	10	10	-
G_LITH_TXT	C (Character)	254	254	-
G_NOTE_TXT	C (Character)	254	254	-
GMAP_SRC	C (Character)	100	100	-

(1) Denotes primary key field.

ATTRIBUTE FIELD DESCRIPTIONS:

GLG_SYM Age-lithology symbol/code of geologic unit. The field is the primary key used to relate the CODEGLG1.INF or CODEGLG1.DBF file to the geologic unit (CODEGLG) and other themes with a GLG_SYM field that possess less descriptive unit lithology data.

GLG_NAME Name of geologic unit.

GLG_FM Geologic formation name or equivalent grouping, if any.

GLG_MBR Geologic member name or equivalent subgrouping, if any.

G_REL_AGE Relative age of geologic unit.

G_SSCR_TXT Subscript from the map symbol.

GLG_AGE_NO Number used to age-sort geologic units, from youngest (low) to oldest (high). Values assigned to each geologic unit is dependent on the geologic units that comprise the compiled NPS Unit geologic map. Subdivisions of geologic units is often denoted by assigning the same integer component

of a decimal number to each division of the geologic unit and using the decimal fraction to differentiate the subdivisions.

G_AGE_TXT Geologic time period text of geologic/lithologic unit.

G_AGE_PER Period(s) or Epoch(s) of Geologic Time of unit (e.g. Cretaceous, Eocene). Time adjective (i.e. late, Early, lower), if any, is omitted.

G_MJ_LITH Lithology type of geologic/lithologic unit.

G_MJ_LITH Code Value List

EXT	extrusive igneous
EAI	extrusive and intrusive igneous
INT	intrusive igneous
MAS	metamorphic and sedimentary
MET	metamorphic
SED	sedimentary
VAS	volcanic and sedimentary
UNC	unconsolidated

G_LITH_ID Lithology type code value. Derived from LITH_ID code value in USGS Geology Data Model. (Version 4.3; table 33).

G_LITH_TXT Textual description of unit lithology.

G_NOTE_TXT Descriptive notes about the geologic/lithologic unit.

GMAP_SRC Source map(s) GMAP_ID values.

Example record from BLCAGLG1.INF or BLCALG1.DBF

```
GUNIT_ID = 35
GLG_SYM = Tc
GLG_NAME = Carpenter Ridge Tuff, welded or partially welded tuff
GLG_FM = Carpenter Ridge Tuff
GLG_MBR = welded or partially welded tuff
G_REL_AGE = T
G_SSCR_TXT = c
GLG_AGE_NO = 3.5
G_AGE_TXT = Oligocene
G_AGE_PER = Oligocene
G_MJ_LITH = EXT
G_LITH_ID = 61
G_LITH_TXT = devitrified, welded or partially welded tuff
G_NOTE_TXT = Tertiary volcanics
GMAP_SRC = 1, 2, 4, 5, 6, 8, 9, 11
```

TABLE COVERAGE/FILE NAME: CODEMAP.INF (ArcInfo), CODEMAP.DBF (ArcView 3.X)
TABLE FORMAT: INFO table (ArcInfo), dBase IV (ArcView 3.X)
NUMBER OF FIELDS: 17

FIELD NAME	TYPE	INPUT WIDTH	OUTPUT WIDTH	DECIMAL PLACES
GMAP_ID ⁽¹⁾	I (Integer)	6	6	-
GMAP_CODE	C (Character)	4	4	-
GMAP_ABBRV	C (Character)	150	150	-
GMAP_YEAR	I (Integer)	4	4	-
GMAP_AUTH	C (Character)	150	150	-
GMAP_ORG	C (Character)	100	100	-.
GMAP_TITLE	C (Character)	254	254	-
GMAP_SER	C (Character)	40	40	-
GMAP_SCALE	I (Integer)	6	6	-
GMAP_PROJ	C (Character)	100	100	-.
GMAP_REF	C (Character)	254	254	-
GMAP_DESC	C (Character)	254	254	-
GMAP_XMAX	F (Float)	8	20	6
GMAP_XMIN	F (Float)	8	20	6
GMAP_YMAX	F (Float)	8	20	6
GMAP_YMIN	F (Float)	8	20	6
GMAP_SRC	C (Character)	254	254	-

(1) Denotes primary key field.

FIELD DESCRIPTIONS/COMMENTS:

GMAP_ID Unique integer value assigned to the source map in the GMAP_ID database. The integer value assigned is the map's record number in the GMAP_ID database. The field is a 'key' in a one-to-one relationship with the GMAP_ID database, and the CODEMAP.INF (Info) and CODEMAP.DBF tables derived from the GMAP_ID database. Information contained within these files relates; NPS unit(s) the map is relevant to, map alpha code, map name abbreviation, year of map publication, author(s) of the map, originator or publisher of the map, complete map title, map series number, map scale, map projection, complete map citation listing in USGS format, map description, bounding coordinates of the map extent, and a list of the map's source(s).

GMAP_CODE Unique 4-letter alpha code assigned to a map. For compiled NPS unit digital geologic maps this code is often the NPS Unit's alpha code.

GMAP_ABBRV Abbreviation of map title. Abbreviation often includes map or quadrangle name and interpretation technique (e.g., Preliminary, Photogeologic) and/or a map emphasize term on the distribution of specific materials (e.g., Surficial, Bedrock).

GMAP_YEAR Year of map compilation or publication.

GMAP_AUTH Map author(s) and compiler(s). For digital maps, digital compiler(s) and digitizer(s) may also be cited.

GMAP_ORG Abbreviation of organization that compiled and/or published map.

GMAP_TITLE Published or compiled map title.

GMAP_SER Map series and/or organizational identifier (e.g., USGS GQ-1516).

GMAP_SCALE Source map scale denominator.

GMAP_PROJ Name or description of map projection with projection datum.

GMAP_REF Complete map citation in USGS style; author(s), year, title, originator, series number, scale.

GMAP_DESC Brief description of map extent, interpretation methodology and/or emphasize.

GMAP_XMAX Western limit (longitude) of map extent in decimal degrees.

GMAP_XMIN Eastern limit (longitude) of map extent in decimal degrees.

GMAP_YMAX Northern limit (latitude) of map extent in decimal degrees.

GMAP_YMIN Southern limit (latitude) of map extent in decimal degrees.

GMAP_SRC Source map(s) with organization and map series number (i.e. USGS GQ-1402, USGS GQ-1568).

Example record for the Geologic map of Rocky Mountain National Park and Vicinity, Colorado. The 4-letter NPS alpha code for Rocky Mountain NP is ROMO.

ROMOMAP.INF or ROMOMAP.DBF

GMAP_ID = 144

GMAP_CODE = ROMO

GMAP_ABBRV = Rocky Mountain NP and Vicinity

GMAP_YEAR = 1990

GMAP_AUTH = Braddock, William A., and Cole, James C.

GMAP_ORG = USGS

GMAP_TITLE = Geologic map of Rocky Mountain National Park and Vicinity, Colorado

GMAP_SER = I-1973

GMAP_SCALE = 50000

GMAP_PROJ = Geographic

GMAP_REF = Braddock, William A., and Cole, James C., 1990, Geologic map of Rocky Mountain National Park and Vicinity, Colorado, USGS, I-1973, 1:50,000 scale

GMAP_DESC = Geologic map of Rocky Mountain National Park and adjacent vicinity.

GMAP_XMAX = -105.958333

GMAP_XMIN = -105.458333

GMAP_YMAX = 40.566666

GMAP_YMIN = 40.125000

GMAP_SRC = see published USGS non-digital (paper) map.

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