U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science Directorate
Geologic Resources Division

Little River Canyon National Preserve

GRI Ancillary Map Information Document

Produced to accompany the Geologic Resources Inventory (GRI) Digital Geologic Data for Little River Canyon National Preserve

liri_geology.pdf

Version: 6/30/2020

Geologic Resources Inventory Ancillary Map Information Document for Little River Canyon National Preserve

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Geologic Resources Inventory Map Document

Little River Canyon National Preserve, Alabama

Document to Accompany Digital Geologic-GIS Data

liri_geology.pdf

Version: 6/30/2020

This document has been developed to accompany the digital geologic-GIS data developed by the Geologic Resources Inventory (GRI) program for Little River Canyon National Preserve, Alabama (LIRI).

Attempts have been made to reproduce all aspects of the original source products, including the geologic units and their descriptions, geologic cross sections, the geologic report, references and all other pertinent images and information contained in the original publication.

This document contains the following information:

1)**About the NPS Geologic Resources Inventory Program** – A brief summary of the Geologic Resources Inventory (GRI) Program and its products. Included are web links to the GRI GIS data model, and to the GRI products page where digital geologic-GIS datasets, scoping reports and geology reports are available for download. In addition, web links to the NPS Data Store and GRI program home page, as well as contact information for the GRI coordinator, are also present.

2)**GRI Digital Maps and Source Citations** – A listing of all GRI digital geologic-GIS maps produced for this project along with sources used in their completion. In addition, a brief explanation of how each source map was used is provided.

3)**Map Unit List** – A listing of all geologic map units present on maps for this project, generally listed from youngest to oldest.

4)**Map Unit Descriptions** – Descriptions for all geologic map units. If a unit is present on multiple source maps the unit is listed with its source geologic unit symbol, unit name and unit age followed by the unit's description for each source map.

5)**Geologic Cross Sections** – Geologic cross section graphics with source geologic cross section abbreviations.

6)**Ancillary Source Map Information** – Additional source map information presented by source map. For each source map this may include a stratigraphic column, index map, map legend and/or map notes.

7)**GRI Digital Data Credits** – GRI digital geologic-GIS data and ancillary map information document production credits.

For information about using GRI digital geologic-GIS data contact:

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About the NPS Geologic Resources Inventory Program

Background

Recognizing the interrelationships between the physical (geology, air, and water) and biological (plants and animals) components of the earth is vital to understanding, managing, and protecting natural resources. The Geologic Resources Inventory (GRI) helps make this connection by providing information on the role of geology and geologic resource management in parks.

Geologic resources for management consideration include both the processes that act upon the Earth and the features formed as a result of these processes. Geologic processes include: erosion and sedimentation; seismic, volcanic, and geothermal activity; glaciation, rockfalls, landslides, and shoreline change. Geologic features include mountains, canyons, natural arches and bridges, minerals, rocks, fossils, cave and karst systems, beaches, dunes, glaciers, volcanoes, and faults.

The Geologic Resources Inventory aims to raise awareness of geology and the role it plays in the environment, and to provide natural resource managers and staff, park planners, interpreters, researchers, and other NPS personnel with information that can help them make informed management decisions.

The GRI team, working closely with the Colorado State University (CSU) Department of Geosciences and a variety of other partners, provides more than 270 parks with a geologic scoping meeting, digital geologic-GIS map data, and a park-specific geologic report.

Products

Scoping Meetings: These park-specific meetings bring together local geologic experts and park staff to inventory and review available geologic data and discuss geologic resource management issues. A summary document is prepared for each meeting that identifies a plan to provide digital map data for the park.

Digital Geologic Maps: Digital geologic maps reproduce all aspects of traditional paper maps, including notes, legend, and cross sections. Bedrock, surficial, and special purpose maps such as coastal or geologic hazard maps may be used by the GRI to create digital Geographic Information Systems (GIS) data and meet park needs. These digital GIS data allow geologic information to be easily viewed and analyzed in conjunction with a wide range of other resource management information data.

For detailed information regarding GIS parameters such as data attribute field definitions, attribute field codes, value definitions, and rules that govern relationships found in the data, refer to the NPS Geology-GIS Data Model document available at: http://science.nature.nps.gov/im/inventory/geology/GeologyGISDataModel.cfm

Geologic Reports: Park-specific geologic reports identify geologic resource management issues as well as features and processes that are important to park ecosystems. In addition, these reports present a brief geologic history of the park and address specific properties of geologic units present in the park.

For a complete listing of Geologic Resource Inventory products and direct links to the download site visit the GRI publications webpage: http://go.nps.gov/gri_products

GRI geologic-GIS data is also available online at the NPS Data Store Search Application: http://irma.nps.gov/App/Reference/Search. To find GRI data for a specific park or parks select the appropriate park(s), enter “GRI” as a Search Text term, and then select the Search Button.

For more information about the Geologic Resources Inventory Program visit the GRI webpage: https://www.nps.gov/subjects/geology/gri.htm, or contact:

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The Geologic Resources Inventory (GRI) program is funded by the National Park Service (NPS) Inventory and Monitoring (I&M) Division.

GRI Digital Maps and Source Map Citations

The GRI digital geologic-GIS maps for Little River Canyon National Preserve, Alabama (LIRI):

The GRI compiled park extent and vicinity map (sources are listed with the individual 7.5' quadrangle component maps below).

Digital Geologic-GIS Map of Little River Canyon National Preserve and Vicinity, Alabama and Georgia (*GRI MapCode LIRI*)

Individual 7.5' quadrangle GRI maps with source publications. These maps were compiled to produce the park and vicinity (LIRI) map.

Digital Geologic-GIS Map of the Dugout Valley Quadrangle, Alabama (*GRI MapCode DUVA*)
Irvin, G. Daniel, Osborne, W. Edward, Raymond, Dorothy E., and Ward II, Willard E., 2018, Geologic Map of the Dugout Valley 7.5' Quadrangle, Dekalb County, Alabama: Geological Survey of Alabama, Open-File Report 1805, plate 1, scale 1:24,000 (Dugout Valley Quadrangle). (*GRI Source Map ID 76234*).

Digital Geologic-GIS Map of the Fort Payne Quadrangle, Alabama and Georgia (*GRI MapCode FOPA*)
Irvin, G. Daniel, et. al., 2018, Geologic Map of the Fort Payne 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: Geological Survey of Alabama, Open-File Report 1805, plate 3, scale 1:24,000 (Fort Payne Quadrangle). (*GRI Source Map ID 76236*).

Digital Geologic-GIS Map of the Gaylesville Quadrangle, Alabama (*GRI MapCode GAYL*)
Cook, Brian S., Irvin, G. Daniel and Osborne, W. Edward, 2019, Geology of the Gaylesville 7.5-Minute Quadrangle, Cherokee County, Alabama: Alabama Geological Survey, unpublished STATEMAP map, scale 1:24,000 (Gaylesville Quadrangle). (*GRI Source Map ID 76317*).

Digital Geologic-GIS Map of the Jamestown Quadrangle, Alabama and Georgia (*GRI MapCode JMST*)
Ma, Chong, and Steltenpohl, Mark, 2018, Bedrock Geologic Map of the Jamestown 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: GSA and Auburn University, Open-File Report 1805, plate 4, scale 1:24,000 (Jamestown Quadrangle). (*GRI Source Map ID 76237*).

Digital Geologic-GIS Map of the Little River Quadrangle, Alabama (*GRI MapCode LIRV*)
Ma, Chong, and Steltenpohl, Mark, 2018, Bedrock Geologic Map of the Little River 7.5' Quadrangle, Cherokee and Dekalb Counties, Alabama: GSA and Auburn University, Open-File Report 1805, plate 5, scale 1:24,000 (Little River Quadrangle). (*GRI Source Map ID 76238*).

Digital Geologic-GIS Map of the Valley Head Quadrangle, Alabama and Georgia (*GRI MapCode VAHE*)
Irvin, G. Daniel, et. al., 2018, Geologic Map of the Valley Head 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: Geological Survey of Alabama, Open-File Report 1805, plate 2, scale 1:24,000 (Valley Head Quadrangle). (*GRI Source Map ID 76235*).

The GRI used the full extent of the source maps above. Source digital GIS data, as well as prominent map components present on the source maps (e.g., related report, unit colors, unit descriptions, cross sections and other ancillary map graphics and text) were incorporated into the GRI digital geologic-GIS dataset and product.

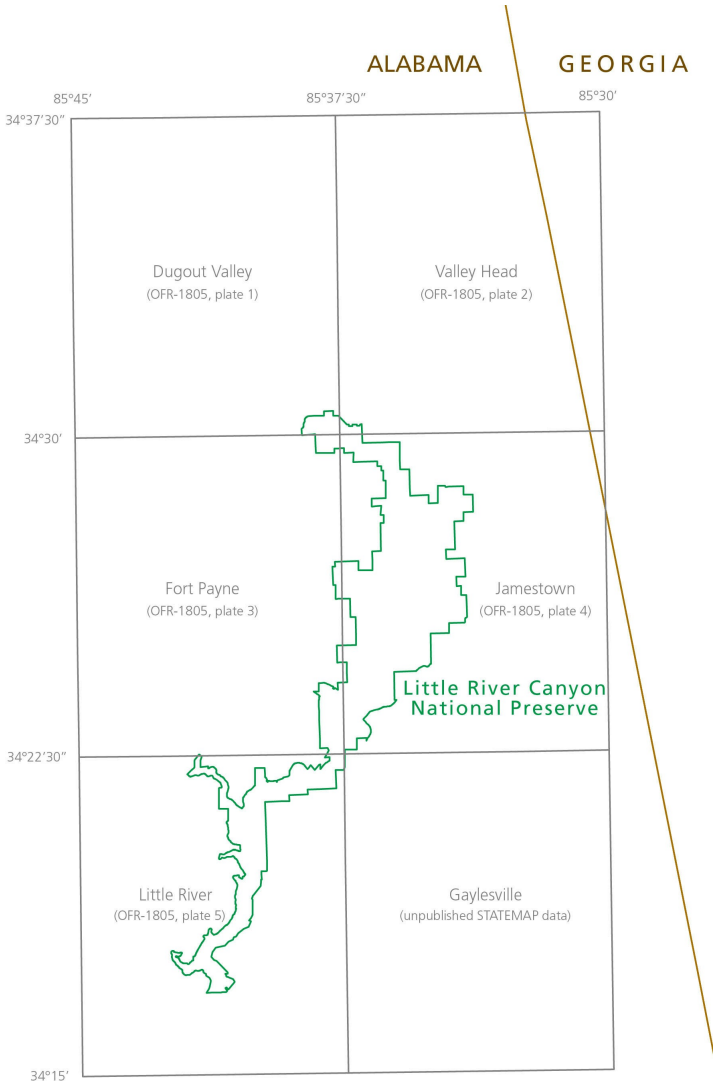
*Note, area strip mines present on the source base maps of the above publications were not captured

because these were not easily delineated, and because its is not known if these features actually still exist as the dates of these base maps are very old.

Additional information pertaining to each source map is also presented in the GRI Source Map Information (LIRIMAP) table included with the GRI geologic-GIS data.

Index Map

The following index map displays the boundary for Little River Canyon National Preserve (in dark green, as of June, 2018). The extent of the GRI digital geologic-GIS map for Little River Canyon National Preserve is outlined in red and includes the Dugout Valley, Valley Head, Fort Payne, Jamestown, Little River, and Gaylesville 7.5' Quadrangles.



Index map produced by James Winter and Stephanie O'Meara (Colorado State University).

Map Unit List

The geologic units present in the digital geologic-GIS data produced for Little River Canyon National Preserve, Alabama (LIRI) are listed below. Units are listed with their assigned unit symbol and unit name (e.g., Qal - Alluvium and low terrace deposits). Units are listed from youngest to oldest. No description for water is provided. Information about each geologic unit is also presented in the GRI Geologic Unit Information (LIRIUNIT) table included with the GRI geologic-GIS data. Some source unit symbols, names and/or ages may have been changed in this document and in the GRI digital geologic-GIS data. This was done if a unit was considered to be the same unit as one or more units on other source maps used for this project, and these unit symbols, names and/or ages differed. In this case a single unit symbol and name, and the unit's now recognized age, was adopted. Unit symbols, names and/or ages in a unit descriptions, or on a correlation of map units or other source map figure were not edited. If a unit symbol, name or age was changed by the GRI the unit's source map symbol, name and/or age appears with the unit's source map description.

Cenozoic Era

Quaternary Period
Qal - Alluvium and low terrace deposits

Tertiary Period
Tal - Fluvial deposits

Paleozoic Era

Pennsylvanian Period
PNpv - Pottsville Formation
PNpvl - Pottsville Formation, lower part

Pennsylvanian and Mississippian Periods
PNMpwp - Parkwood Formation and Pennington Formation, undifferentiated

Mississippian Period
Mf - Floyd Shale
Mbm - Bangor Limestone and Monteagle Limestone, undifferentiated
Mbmt - Bangor Limestone, Monteagle Limestone, and Tuscumbia Limestone, undifferentiated
Mtfpm - Tuscumbia Limestone, Fort Payne Chert and Maury Shale, undifferentiated
Mfpm - Fort Payne Chert and Maury Formation, undifferentiated

Devonian Period
Dc - Chattanooga Shale

Silurian Period
Srm - Red Mountain Formation

Ordovician Period
Os - Sequatchie Formation
Osc - Sequatchie Formation and Chickamauga Limestone, undifferentiated
Oc - Chickamauga Limestone
Oca - Chickamauga Limestone, Attalla Chert Conglomerate Member
On - Newala Limestone
Olv - Longview Limestone

Ordovician and Cambrian Periods
OCchcr - Chepultepec Dolomite and Copper Ridge Dolomite, undifferentiated

OCk - Knox Group undifferentiated

Cambrian Period
Cc - Conasauga Formation

Map Unit Descriptions

Descriptions of all geologic map units, generally listed from youngest to oldest, are presented below.

Qal - Alluvium and low terrace deposits (Quaternary)

Qal - Alluvium and low terrace deposits (Quaternary)
Unconsolidated deposits of dark-brown to reddish-brown clay and sand and gravel composed of quartz and chert. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, and Valley Head Quadrangle.

Qal - Alluvium deposits (Quaternary)
Unconsolidated deposits of sand, silt, clay, gravel, and cobbles. Description from source map: Gaylesville Quadrangle.

Tal - Fluvial deposits (Tertiary)

Pal - Fluvial deposits (Paleogene)
Yellowish-orange to white, thick-bedded conglomerate of subangular to subrounded, predominantly chert pebbles and cobbles and a few white and pink, well-rounded quartzite pebbles; contains white, lavender, and yellowish-orange sandy clay lenses. Underlain by thick bed of unconsolidated, white to very pale orange to lavender, fine- to medium-grained quartz sand. Description from source map: Dugout Valley Quadrangle.

PNpv - Pottsville Formation (Lower Pennsylvanian)

Primarily two pebbly to conglomeratic sandstone units informally referred to as the lower and upper conglomerates separated by a shale-dominated interval. Sandstone is dominantly light gray, medium to coarse grained and quartzose and contains variable amounts of quartz pebbles and locally is quartz pebble conglomerate. Between the lower and upper conglomerates, dark-gray shale contains interbeds of light-gray, sublithic to quartzose sandstone and several coal beds and associated underclays. Locally preserved at the top of the unit above the upper conglomerate are interbedded gray shale, coal, and sandstone. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle,Gaylesville Quadrangle, Jamestown Quadrangle, Little River Quadrangle, and Valley Head Quadrangle.

PNpvl - Pottsville Formation, lower part (Lower Pennsylvanian)

White, fine- to medium-grained, crossbedded quartzose sandstone and quartz-pebble conglomerate in massive beds. Description from source map: Gaylesville Quadrangle.

PNMpwp - Parkwood Formation and Pennington Formation, undifferentiated (Lower Pennsylvanian and Upper Mississippian)

PNMpwp - Parkwood Formation and Pennington Formation, undifferentiated (Upper Mississippian and Lower Pennsylvanian)
Parkwood Formation: Medium- to dark-gray shale and mudstone containing interbedded units of light- to medium-gray quartzose to sublithic sandstone; wavy- and lenticular-bedded sandstone and mudstone are common; interbeds of dark-gray limestone and maroon and green shale are present in the lower part; a coal bed of laterally variable thickness is commonly present at the top of the formation. **Pennington Formation**: Medium- to dark-gray shale containing interbeds of dark-gray, argillaceous, fossiliferous limestone; very fine- to fine-grained argillaceous sandstone; and

carbonaceous claystone to thin, shaly coal. Intervals of maroon and olive-green mudstone are common. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Jamestown Quadrangle, Little River Quadrangle , and Valley Head Quadrangle.

PMpwf? - Parkwood and Pennington Formations, undifferentiated (Upper Mississippian and Lower Pennsylvanian)
Parkwood Formation: Ledges of pale-gray, fine- to medium-grained, mostly crossbedded sandstone, interbedded with light- to dark-gray, thin-bedded shale, mudstones, and siltstones. **Pennington Formation**: Gray shales interbedded with maroon and olive mudstones (not exposed in quadrangle). Description from source map: Gaylesville Quadrangle.

Mf - Floyd Shale (Upper Mississippian)

Dark-gray to black shale and shaly mudstone, locally fossiliferous and calcareous, interbedded with some tan/brown siltstone and fine-grained sandstone. A distinctive basal limestone unit is mapped in this area, which is exposed as medium- to dark-gray, locally fossiliferous, argillaceous lime mudstone. Regionally, a tongue of the Bangor Limestone is also recognized in the formation. Description from source map: Gaylesville Quadrangle.

Mbm - Bangor Limestone and Monteagle Limestone, undifferentiated (Upper Mississippian)

Bangor Limestone: Medium- to dark-gray, mostly thick-bedded, fine-grained, calcareous grainstone that is locally fossiliferous. **Monteagle Limestone**: Light-gray, cross-bedded oolitic limestone in massive beds that are commonly greater than 3 m, with thick interbeds of bioclastic limestone (not exposed in quadrangle). Description from source map: Gaylesville Quadrangle.

Mbmt - Bangor Limestone, Monteagle Limestone, and Tuscumbia Limestone, undifferentiated (Upper Mississippian)

Bangor Limestone: Light- to mostly dark-gray, crossbedded, bioclastic and lesser oolitic, limestone in medium to massive beds; nodules, stringers, and nodular interbeds of dark-gray chert are common in parts of the unit. **Monteagle Limestone:** Primarily light-gray, medium- to massive bedded oolitic and bioclastic limestone locally containing interbeds of dark-gray, fossiliferous shaly limestone and shale. **Tuscumbia Limestone:** Light- to medium-gray, medium- to massive-bedded, predominantly bioclastic limestone locally containing chert nodules. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Jamestown Quadrangle, Little River Quadrangle, and Valley Head Quadrangle.

Mtfpm - Tuscumbia Limestone, Fort Payne Chert and Maury Shale, undifferentiated (Middle and Lower Mississippian)

Tuscumbia Limestone: Light-gray, medium- to thick-bedded, bioclastic or micritic limestone with locally abundant chert nodules or concretions (not exposed in quadrangle). **Fort Payne Chert**: Typically white, fossiliferous, massive chert in thin to medium, irregular beds, interbedded with light- to medium-gray, thin-bedded, laminated, siltstone or silty mudstone that is locally calcareous. **Maury Formation**: Bluish-green/gray, saprolitic clay shale. Description from source map: Gaylesville Quadrangle.

Mfpm - Fort Payne Chert and Maury Formation, undifferentiated (Middle and Lower Mississippian)

Fort Payne Chert: Light- to dark-gray siliceous limestone containing interbeds and nodules of chert typically weathered in outcrops to light-gray to grayish-orange, thin- to medium-bedded, variably fossiliferous chert; quartz-lined vugs (geodes) are common in the lower part. **Maury Formation:** Light-olive-gray to yellowish-green shale and mudstone containing small phosphatic concretions. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Jamestown Quadrangle, and Little River Quadrangle.

Dc - Chattanooga Shale (Upper Devonian)

Dc - Chattanooga Shale (Upper Devonian)
Dark-gray to black, pyritiferous, carbonaceous shale and mudstone; thin beds of dark-gray to black, coarse-grained, partly pebbly sandstone are locally present at the base. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Jamestown Quadrangle, and Little River Quadrangle, and Valley Head Quadrangle.

Dc - Chattanooga Shale (Upper Devonian)
Black or dark-gray, typically deformed, fissile shale and thin-bedded mudstone. Description from source map: Gaylesville Quadrangle.

*On the Gaylesville Quadrangle, Little River Quadrangle and Valley Head Quadrangle, unit Dc (Chattanooga Shale) only appears as a linear geologic unit.

Srm - Red Mountain Formation (Upper and Lower Silurian)

Srm - Red Mountain Formation (Lower and Upper Silurian)
Primarily olive-gray, partly silty shale and interbedded olive-gray and dark-reddish brown sandstone containing minor amounts of fossiliferous limestone and hematitic sandstone. The lower part includes light-gray, coarse-grained limestone and partly sandy and hematitic limestone previously mined as iron ore. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Little River Quadrangle, and Valley Head Quadrangle.

Srm - Red Mountain Formation (Lower Silurian)
Rusty reddish to yellowish tan or brown, thin- to thick-bedded siltstone, fine- to coarse-grained sandstone, and mostly thin-bedded mudstone (that is greenish gray in places), which are locally laminated or cross-bedded. Outcrops commonly are stained rusty orange or limonitic yellow color from iron oxide staining. Also, a fine- to medium-grained sandstone with very coarse quartzose grains throughout (local granules up to about 0.25 inches wide) observed in at least two stratigraphic horizons Description from source map: Gaylesville Quadrangle.

Srm - Red Mountain Formation (Lower and Upper Silurian)
Primarily olive-gray, partly silty shale and interbedded olive-gray and dark-reddish brown sandstone containing minor amounts of fossiliferous limestone and hematitic sandstone. Description from source map: Jamestown Quadrangle..

Os - Sequatchie Formation (Upper Ordovician)

Os - Sequatchie Formation (Upper Ordovician)
Mottled yellowish-green to olive-gray and dusky-red to reddish-gray calcareous shale; brown fine-grained sandstone; and light- to dark-gray, fine- to coarse-grained fossiliferous limestone. The basal

part includes olive-gray and grayish-red, partly fenestral limestone; near the middle is a prominent fine- to very coarse-grained, fossiliferous sandstone that weathers reddish-brown; the uppermost part includes greenish-gray shale overlain by very fine-grained tan sandstone. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, Little River Quadrangle, and Valley Head Quadrangle.

Os - Sequatchie Formation (Upper Ordovician)
Light- to dark-gray, thin- to thick-bedded mudstone and siltstone, and rusty, reddish brown, fine- to coarse-grained, cross-bedded sandstone. Formation may be identified by distinctive pattern of dissolution pitting along bedding planes, which results from weathering of carbonate sediments. Description from source map: Gaylesville Quadrangle.

Os - Sequatchie Formation (Upper Ordovician)
Mottled yellowish-green to olive-gray and dusky-red to reddish-gray calcareous shale; brown fine-grained sandstone; and light- to dark-gray, fine- to coarse-grained fossiliferous limestone. Description from source map: Jamestown Quadrangle.

Osc - Sequatchie Formation and Chickamauga Limestone, undifferentiated (Upper and Middle Ordovician)

See Os (Sequatchie Formation) and Oc (Chickamauga Limestone) for unit descriptions. Unit present on source map: Gaylesville Quadrangle.

Oc - Chickamauga Limestone (Middle Ordovician)

Oc - Chickamauga Limestone (Middle Ordovician)
Light- to dark-gray, variably fossiliferous limestone interbedded with minor light- to medium-gray, fine- to medium-crystalline dolomite; contains two thin bentonitic intervals in the upper part. The lower part of the formation includes light-greenish-gray, argillaceous dolomite; moderate-orange-brown and maroon-brown silty clay and olive shale; light-gray fenestral lime mudstone; fossiliferous cherty limestone; and rare sandstone and chert breccia (Pond Spring facies). ((Description from source maps Dugout Valley Quadrangle, Fort Payne Quadrangle, Little River Quadrangle, and Valley Head Quadrangle).

Oc - Chickamauga Limestone (Middle Ordovician)
Bluish, pale- to dark-gray, lime mudstone or siltstone, which weathers to purplish gray, in locally (slightly) irregular or nodular beds; beds generally are thin and locally fossiliferous or laminated. Clastic sediment content largely increases upsection. Locally includes basal Attalla Chert Conglomerate Member, which is comprised of purplish-gray, thin- to thick-bedded, locally poorly-sorted, chert clast conglomerate. Description from source map: Gaylesville Quadrangle.

Oc - Chickamauga Limestone (Middle Ordovician)
Light- to dark-gray, variably fossiliferous limestone interbedded with minor light- to medium gray, fine- to medium-crystalline dolomite; contains two thin bentonitic intervals in the upper part. (Description from source map: Jamestown Quadrangle).

Oca - Chickamauga Limestone, Attalla Chert Conglomerate Member (Middle Ordovician?)

Oca - Attalla Chert Conglomerate Member of Chickamauga Limestone (Middle Ordovician?)
Grayish-orange chert pebble conglomerate and breccia. Description from source map: Little River Quadrangle.

On - Newala Limestone (Lower Ordovician)

Light-gray, thin- to massive-bedded micritic limestone and interbedded light-gray, very finely to medium crystalline, dominantly thin bedded dolomite; contains minor dark-gray chert nodules and stringers. Description from source maps:Dugout Valley Quadrangle, Fort Payne Quadrangle and Valley Head Quadrangle.

Olv - Longview Limestone (Lower Ordovician)

Light- to medium-gray, thin- to thick-bedded micritic limestone and finely to medium crystalline dolomite containing nodules and discontinuous stringers of chert; residual chert commonly preserves the texture of intraclastic carbonate and locally contains quartz sand and chert pebbles. (Description from source maps:Dugout Valley Quadrangle, Fort Payne Quadrangle, and Valley Head Quadrangle).

OCchcr - Chepultepec Dolomite and Copper Ridge Dolomite, undifferentiated (Lower Ordovician and Upper Cambrian)

Chepultepec Dolomite: Light- to medium-gray, very fine- to medium crystalline, thin to massive-bedded siliceous dolomite and probable interbedded limestone; weathers to dominantly light-colored residual chert in an orange-brown to dark-reddish-brown clay matrix; residual chert commonly preserves the features of the original carbonate rocks (stromatolites, thrombolites, ooids, intraclasts, vugs, disseminated quartz sand). **Copper Ridge Dolomite**: Predominantly stromatolitic chert residuum apparently weathered from siliceous dolomite. Description from source maps: Dugout Valley Quadrangle, Fort Payne Quadrangle, and Valley Head Quadrangle.

OCk - Knox Group, undifferentiated (Lower Ordovician and Upper Cambrian)

OCk - Knox Group undifferentiated (Upper Cambrian and Lower Ordovician)
Carbonate outcrops consist of pale- to light-gray, fine- to medium-grained, thin- to thick-bedded, calcareous or dolomitic grainstone interlayered with chert beds that are locally irregular. Residual chert typically is white, massive, blocky chert that is commonly stained to a rusty red in spots and is locally pitted with dolomite rhomb molds and slightly bluish, medium-gray, somewhat vitreous chert, which is locally mottled or interlaminated with the white massive chert. Blocks of grainy and cavernous white chert is mixed in with the residuum in some places. Chert residuum often is exposed in an orange-brown to dark-reddish-brown clay soil, and is brecciated is some locations. Description from source map: Gaylesville Quadrangle.

OCk - Knox Group, undifferentiated (Upper Cambrian and Lower Ordovician)
Light- to medium-dark-gray, fine- to coarse-crystalline, thin- to massive-bedded dolomite containing irregular nodules, stringers, and thin beds of light-gray to yellow-orange, dense locally oolitic chert; weathers to dominantly light-colored residual chert in an orange-brown to dark-reddish-brown clay matrix; residual chert commonly preserves the texture of the original carbonate rocks. Description from source maps: Jamestown Quadrangle and Little River Quadrangle.

Cc - Conasauga Formation (Upper and Middle Cambrian)

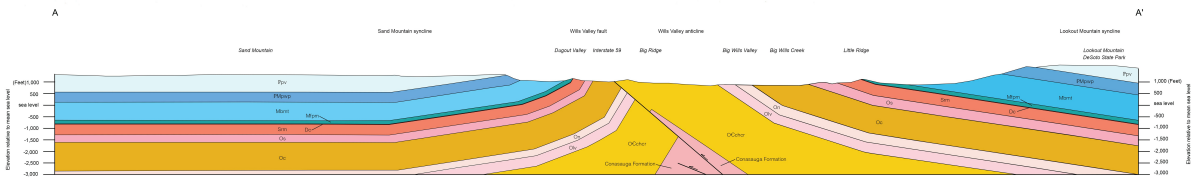
Cc - Conasauga Formation (Middle and Upper Cambrian)
Thick-bedded, medium-gray, stylonodular micritic limestone with locally abundant thin, wispy dolostone stringers; outcrops generally weather to light bluish gray. Description from source map: Gaylesville Quadrangle.

Cc - Conasauga Formation (Middle and Upper Cambrian)
Dark-gray, stylolitic to stylonodular, micritic limestone commonly containing trilobite fragments.
Description from source map: Jamestown Quadrangle

Geologic Cross Sections

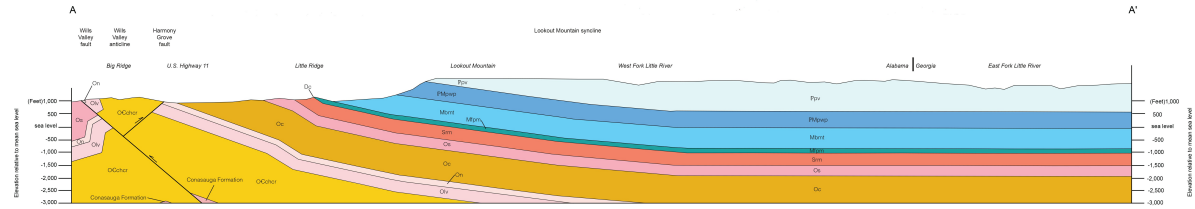
The geologic cross sections present in the GRI digital geologic-GIS data produced for Little River Canyon National Preserve, Alabama (LIRI) are presented below. Note that some cross section abbreviations (e.g., A - A') may have been changed from their source map abbreviation in the GRI data so that each cross section abbreviation in the GRI data is unique. Cross section graphics were scanned at a high resolution and can be viewed in more detail by zooming in (if viewing the digital format of this document).

Cross Section A-A'



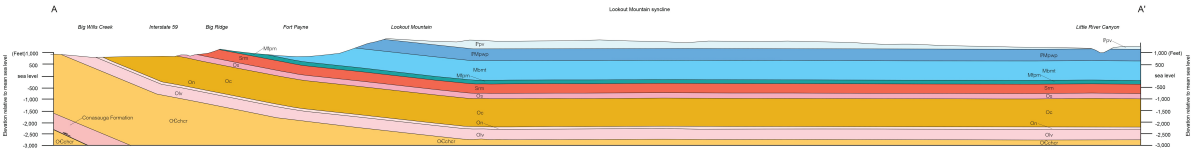
Cross section from source map: Dugout Valley Quadrangle.

Cross Section B-B'



Cross section from source map: Valley Head Quadrangle. Cross section A-A' on source map.

Cross Section C-C'



Cross section from source map: Fort Payne Quadrangle. Cross section A-A' on source map.

Symbols for Cross Sections

SYMBOLS FOR CROSS SECTIONS

Stratigraphic contact

Fault, showing relative movement

Ancillary Source Map Information

The following section presents ancillary source map information associated with source maps used for this project.

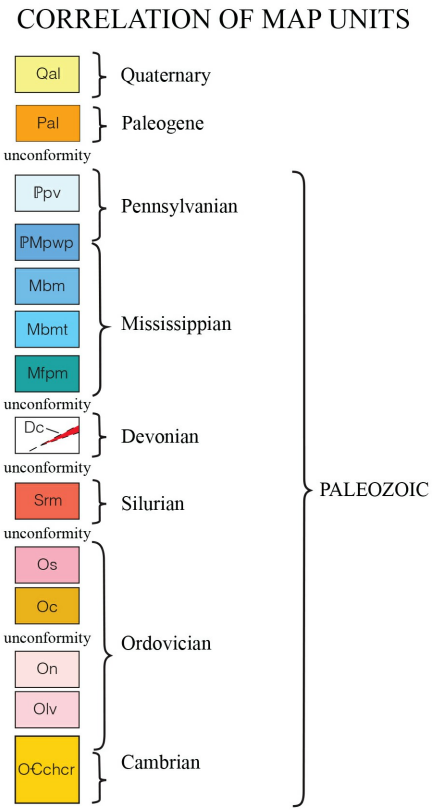
Dugout Valley Quadrangle

The formal citation for this source.

> Irvin, G. Daniel, Osborne, W. Edward, Raymond, Dorothy E., and Ward II, Willard E., 2018, Geologic Map of the Dugout Valley 7.5' Quadrangle, Dekalb County, Alabama: Geological Survey of Alabama, Open-File Report 1805, plate 1, scale 1:24,000 (*GRI Source Map ID 76234*).

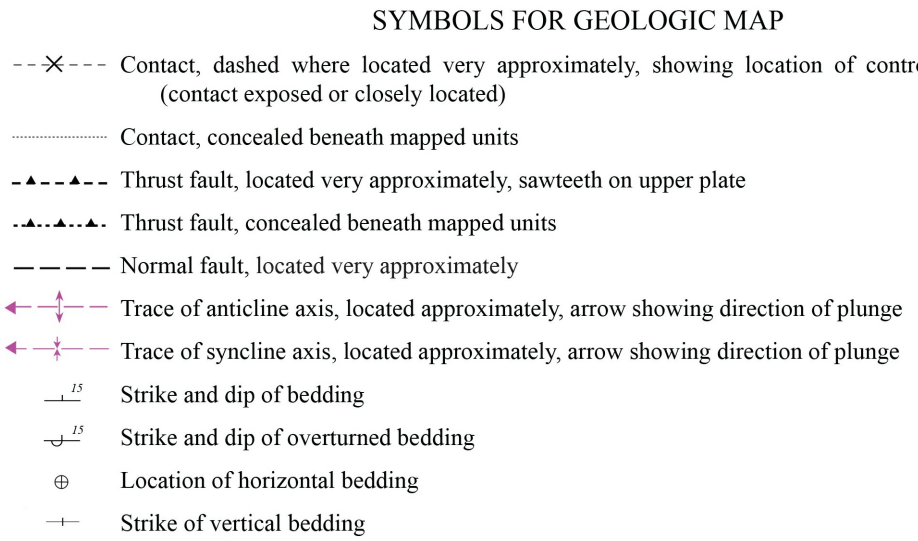
Prominent graphics associated with this source map.

Correlation of Map Units



Graphic from source map: Dugout Valley Quadrangle. Note, unit Mbm does not exist on the source map, and therefore is an error on the above correlation of units figure.

Map Legend



Graphic from source map: Dugout Valley Quadrangle.

Quadrangle Location

Graphic from source map: Dugout Valley Quadrangle.

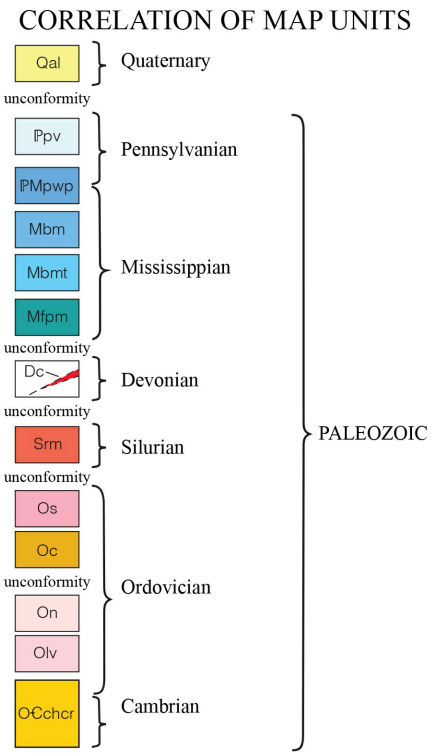
Fort Payne Quadrangle

The formal citation for this source.

> Irvin, G. Daniel, et. al., 2018, Geologic Map of the Fort Payne 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: Geological Survey of Alabama, Open-File Report 1805, plate 3, scale 1:24,000 (*GRI Source Map ID 76236*).

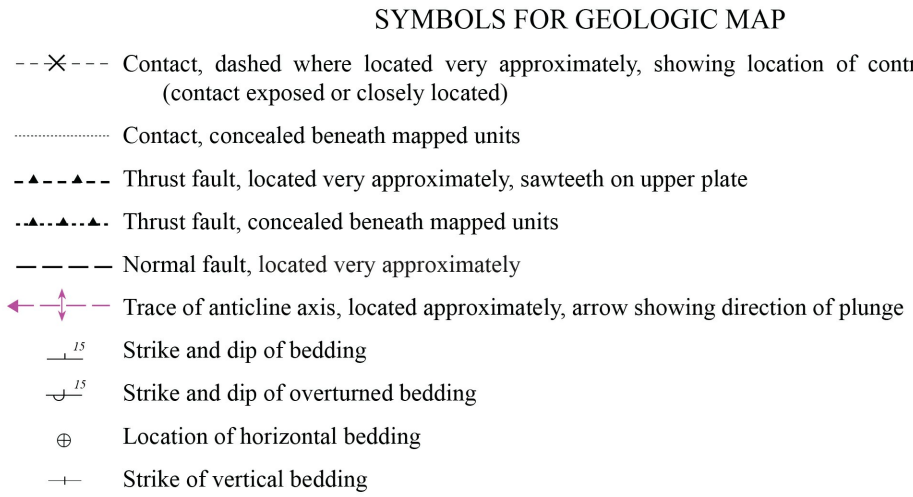
Prominent graphics associated with this source map.

Correlation of Map Units



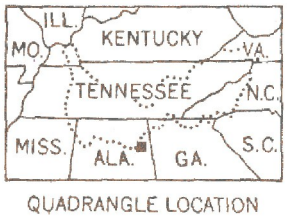
Graphic from source map: Fort Payne Quadrangle. Note, unit Mbm does not exist on the source map, and therefore is an error on the above correlation of units figure.

Map Legend



Graphic from source map: Fort Payne Quadrangle.

Quadrangle Location



Graphic from source map: Fort Payne Quadrangle.

Gaylesville Quadrangle

The formal citation for this source.

> Cook, Brian S., Irvin, G. Daniel and Osborne, W. Edward, 2019, Geology of the Gaylesville 7.5-Minute Quadrangle, Cherokee County, Alabama: Alabama Geological Survey, unpublished STATEMAP map, scale 1:24,000. (*GRI Source Map ID 76317*).

No additional information or graphics other than unit descriptions was provided for this source map.

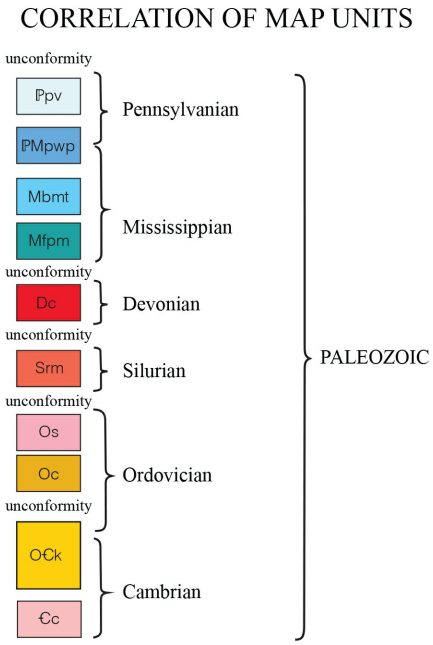
Jamestown Quadrangle

The formal citation for this source.

> Ma, Chong, and Steltenpohl, Mark, 2018, Bedrock Geologic Map of the Jamestown 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: GSA and Auburn University, Open-File Report 1805, plate 4, scale 1:24,000 (*GRI Source Map ID 76237*).

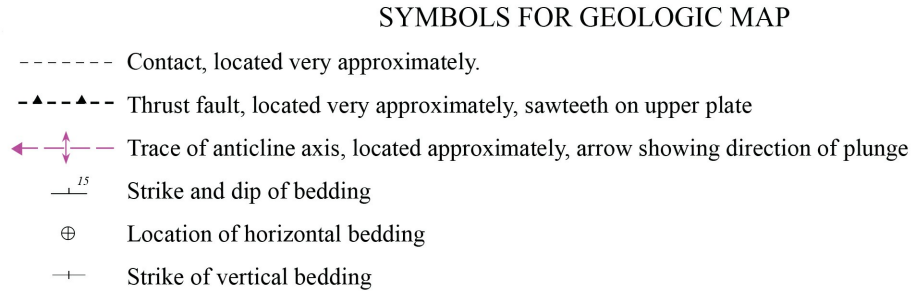
Prominent graphics associated with this source map.

Correlation of Map Units



Graphic from source map: Jamestown Quadrangle.

Map Legend



Graphic from source map: Jamestown Quadrangle.

Quadrangle Location

Graphic from source map: Jamestown Quadrangle.

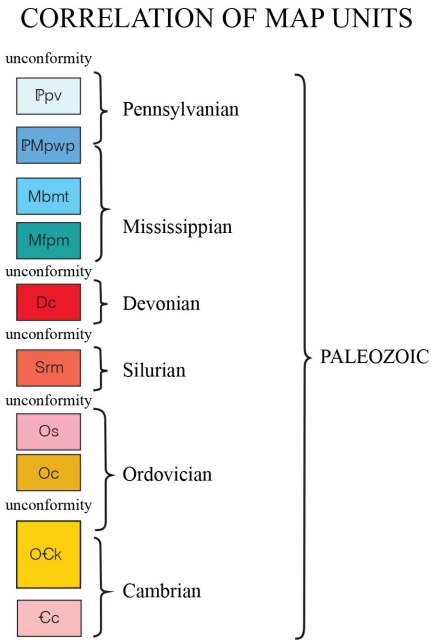
Little River Quadrangle

The formal citation for this source.

> Ma, Chong, and Steltenpohl, Mark, 2018, Bedrock Geologic Map of the Little River 7.5' Quadrangle, Cherokee and Dekalb Counties, Alabama: GSA and Auburn University, Open-File Report 1805, plate 5, scale 1:24,000 (*GRI Source Map ID 76238*).

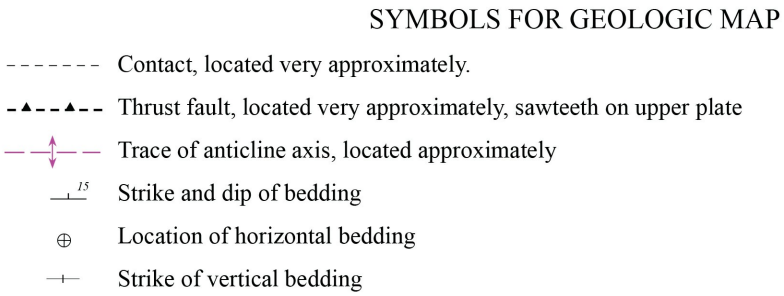
Prominent graphics associated with this source map.

Correlation of Map Units



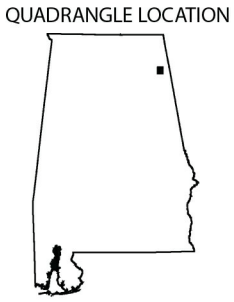
Graphic from source map: Little River Quadrangle.

Map Legend



Graphic from source map: (Little River Quadrangle.

Quadrangle Location



Graphic from source map: Little River Quadrangle.

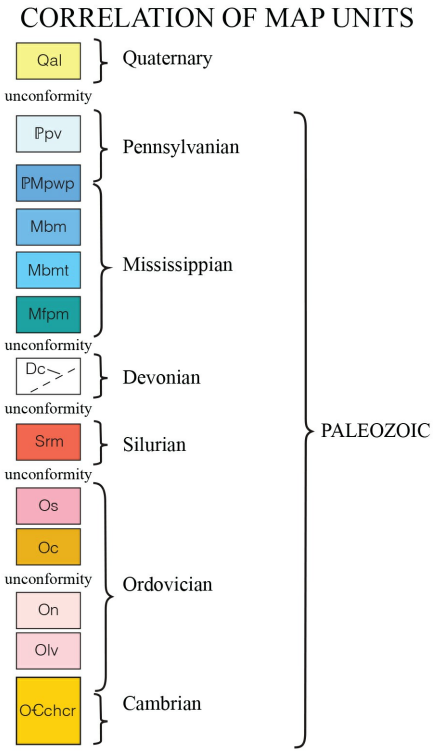
Valley Head Quadrangle

The formal citation for this source.

> Irvin, G. Daniel, et. al., 2018, Geologic Map of the Valley Head 7.5' Quadrangle, Dekalb and Cherokee Counties, Alabama, and Chattanooga and Walker Counties, Georgia: Geological Survey of Alabama, Open-File Report 1805, plate 2, scale 1:24,000 (*GRI Source Map ID 76235*).

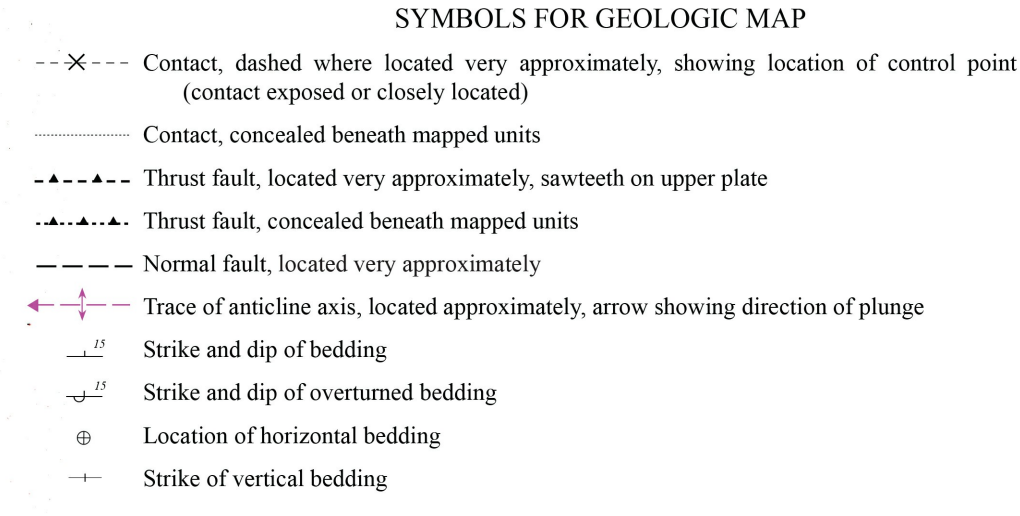
Prominent graphics associated with this source map.

Correlation of Map Units



Graphic from source map: Valley Head Quadrangle. Note, unit Mbm and MFpm do not exist on the source map, and therefore are errors on the above correlation of units figure.

Map Legend



Graphic from source map: Valley Head Quadrangle.

Quadrangle Location

Graphic from source map: Valley Head Quadrangle.

GRI Digital Data Credits

This document was developed and completed by James Winter and Stephanie O'Meara (Colorado State University) for the NPS Geologic Resources Division (GRD) Geologic Resources Inventory (GRI) Program. Quality control of this document by Stephanie O'Meara and James Winter.

The information in this document was compiled from GRI source maps, and intended to accompany the digital geologic-GIS maps and other digital data for Little River Canyon National Preserve, Alabama (LIRI) developed by James Winter and Stephanie O'Meara (Colorado State University) (see the GRI Digital Maps and Source Map Citations section of this document for all sources used by the GRI in the completion of this document and related GRI digital geologic-GIS maps).

GRI finalization by Stephanie O'Meara (Colorado State University).

GRI program coordination and scoping provided by Jason Kenworthy and Tim Connors (NPS GRD, Lakewood, Colorado).