

Interim Geologic Map of the Summit Quadrangle, Iron County, Utah

Type File Geodatabase Feature Dataset

Tags geologic map, geology, contacts, faults, geologic formations, geologic units, GIS, Summit, Iron County Utah, geoscientific information

Summary

This map represents the geology of the Summit Quadrangle at a scale of 1:24,000.

Description

This quadrangle includes the westernmost part of Utah's "red rock country" and the east side of the Beaver Dam Mountains. The magnificent sequence of sedimentary rocks exposed in this map area is composed of Paleozoic marine carbonate rocks more than 2 miles (3.2 km) thick, overlain by more than a mile (1.6 km) of mostly non-marine, Mesozoic, multicolored sandstone and shale. These are, in turn, locally capped by a 1.6 million-year-old basalt flow and a few hundred feet of Quaternary stream- and wind-laid deposits. The Paleozoic and Mesozoic strata are folded into a broad north-trending syncline and some smaller folds of similar orientation. These folds are cut by north-trending faults that mostly exhibit a combination of down-to-the-west vertical displacement and left-lateral horizontal offset.

Credits

Project Manager: Stefan Kirby
GIS and Cartography: Tyler R. Knudsen
Geology review: Adam McKean, Bob Biek, Stefan Kirby, Stephanie Carney, and Mike Hylland
GeMS Conversion: Joshua A. Dustin
GeMS Review: Subigya Shah and Austin Jensen
Funding: Utah Geological Survey and the U.S. Geological Survey, National Cooperative Geologic Mapping Program, through UGS STATEMAP award number G21AC10880 (2020–2022).

Use limitations

This open-file release makes information available to the public that has undergone only minimal peer review and may not conform to Utah Geological Survey technical, editorial, or policy standards. The map may be incomplete, and inconsistencies, errors, and omissions have not been resolved. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding the suitability of this product for a particular use, and does not guarantee accuracy or completeness of the data. The Utah Department of Natural Resources, Utah Geological Survey, shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to claims by users of this product. For use at 1:24,000 scale.

This geologic map was funded by the Utah Geological Survey and the U.S. Geological Survey National Cooperative Geologic Mapping Program under STATEMAP award number G21AC10880 (2020–2022). The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

Extent

West -113.006002 East -112.866824
North 37.877928 South 37.674700

Scale Range

Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:150,000,000

Topics and Keywords ►

Themes or categories of the resource Geoscientific

Content type ⇌ Downloadable Data
Export to FGDC CSDGM XML format as Resource Description No

Theme keywords geoscientificInformation

Thesaurus ►
Title ISO 19115 Topic Categories

Theme keywords geologic map, geology, contacts, faults, geologic formations, geologic units, GIS, Summit, Iron County Utah, geoscientific information

Place keywords Summit, Iron County, Utah

Citation ►

Title Interim Geologic Map of the Summit Quadrangle, Iron County, Utah
Publication date 2020-10-01 00:00:00

Edition 1.0

Presentation formats digital map
FGDC geospatial presentation format vector digital data

Series
Name Map
Issue OFR-775DM
Collection title Interim Geologic Map of the Summit Quadrangle, Iron County, Utah

Other citation details
Knudsen, T.R., 2026, Interim geologic map of the Summit quadrangle, Iron County, Utah: Utah Geological Survey Open-File Report 775DM, 19 p., 2 plates, scale 1:24,000, <https://doi.org/10.34191/OFR-775DM>.

Citation Contacts ►

Responsible party - originator
Individual's name UGS Geologic Mapping Program
Organization's name Utah Geological Survey
Contact's position GIS Analyst

Contact information ►

Phone
Voice (801) 537-3300

Address
Type physical
Delivery point 1594 W. North Temple
City Salt Lake City
Administrative area Utah
Postal code 84116-3154
Country US
Hours of service
Monday - Friday 8 am - 5 pm

Resource Details ►

Dataset languages English (UNITED STATES)
Dataset character set utf8 - 8 bit UCS Transfer Format

Status completed
Spatial representation type ⇔ vector

Processing environment Esri ArcMap and/or ArcGIS Pro

Credits
Project Manager: Stefan Kirby
GIS and Cartography: Tyler R. Knudsen
Geology review: Adam McKean, Bob Biek, Stefan Kirby, Stephanie Carney, and Mike Hylland
GeMS Conversion: Joshua A. Dustin
GeMS Review: Subigya Shah and Austin Jensen
Funding: Utah Geological Survey and the U.S. Geological Survey, National Cooperative Geologic Mapping Program, through UGS STATEMAP award number G21AC10880 (2020–2022).

ArcGIS item properties
Name ⇔ GeologicMap
Location ⇔ file:/A\\SEDNr-L03V-3UFD\G\$\Working Projects\Summit\Spatial\gdb\OFRXXX_Summit.gdb
Access protocol ⇔ Local Area Network

Extents ►

Extent
Geographic extent
Bounding rectangle
West longitude -112.126
East longitude -111.998
South latitude 40.369
North latitude 40.503

Extent
Description
Unknown

Temporal extent
Date and time 2020-10-01 00:00:00

Extent
Geographic extent
Bounding rectangle
Extent type
Extent used for searching
West longitude ⇔ -113.006002
East longitude ⇔ -112.866824
North latitude ⇔ 37.877928
South latitude ⇔ 37.674700
Extent contains the resource ⇔ Yes

Extent in the item's coordinate system
westBL ⇔ 323572.607700
eastBL ⇔ 335373.894700
southBL ⇔ 4171606.244900
northBL ⇔ 4193922.523500
exTypeCode ⇔ Yes

Resource Points of Contact ►

Point of contact - distributor
Organization's name Utah Geological Survey
Individual's name Interactive Geologic Map Portal

Contact information ►

Phone
Voice Local: (801) 537-3300
Voice Toll free: (801) UTAH Map (888) 882-4627

Address
Type physical
Delivery point 1594 W. North Temple
City Salt Lake City
Administrative area Utah
Postal code 84116-3154
Country US
Hours of service
Online web service

Contact instructions

<https://geology.utah.gov/apps/intgeomap/>

Resource Maintenance ►

Resource maintenance
Update frequency not planned

Resource Constraints ►

Legal constraints
Limitations of use
See access and use constraints information.

Constraints
Limitations of use
This open-file release makes information available to the public that has undergone only minimal peer review and may not conform to Utah Geological Survey technical, editorial, or policy standards. The map may be incomplete, and inconsistencies, errors, and omissions have not been resolved. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding the suitability of this product for a particular use, and does not guarantee accuracy or completeness of the data. The Utah Department of Natural Resources, Utah Geological Survey, shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to claims by users of this product. For use at 1:24,000 scale.

This geologic map was funded by the Utah Geological Survey and the U.S. Geological Survey National Cooperative Geologic Mapping Program under STATEMAP award number G21AC10880 (2020–2022). The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

Spatial Reference ►

ArcGIS coordinate system
Type ⇔ Projected
Geographic coordinate reference ⇔ GCS_North_American_1983
Projection ⇔ NAD_1983_UTM_Zone_12N
Coordinate reference details ⇔
ProjectedCoordinateSystem
WKID 26912
XOrigin -5120900
YOrigin -9998100
XYScale 10000
ZOrigin -100000
ZScale 10000
MOrigin -100000
MScale 10000
XYTolerance 0.001
ZTolerance 0.001
MTolerance 0.001
HighPrecision true
LatestWKID 26912
WKT
PROJCS["NAD_1983_UTM_Zone_12N",GEOGCS["GCS_North_American_1983",DATUM["D_North_American_1983",SPHEROID["GRS_1980",6378137.0,298.257222101]],PRIMEM["Greenwich",0.0],UNIT["D

Reference system identifier
Value ⇔ 26912
Codespace ⇔ EPSG
Version ⇔ 6.11(3.0.1)

Spatial Data Properties ►

Vector ►
Level of topology for this dataset ⇔ geometry only

Geometric objects
Feature class name MapUnitPolys
Object type ⇔ composite
Object count ⇔ 772
Geometric objects
Feature class name ContactsAndFaults
Object type ⇔ composite
Object count ⇔ 1637
Geometric objects
Feature class name GeologicLines
Object type ⇔ composite
Object count ⇔ 35
Geometric objects
Feature class name CartographicLines
Object type ⇔ composite
Object count ⇔ 74
Geometric objects
Feature class name MapUnitLines
Object type ⇔ composite
Object count ⇔ 4
Geometric objects
Feature class name OrientationPoints
Object type ⇔ point
Object count ⇔ 84
Geometric objects

Feature class name GeologicPoints
Object type ⇔ point
Object count ⇔ 60

Geometric objects
Feature class name CartographicPoints
Object type ⇔ point
Object count ⇔ 243

Geometric objects
Feature class name Quadrangle_Boundary
Object type ⇔ composite
Object count ⇔ 1

Geometric objects
Feature class name Summit_GeologicUnits_labels
Object type ⇔ composite
Object count ⇔ 413

Geometric objects
Feature class name Summit_GeologicFeatures_labels
Object type ⇔ composite
Object count ⇔ 120

ArcGIS Feature Class Properties ►
Feature class name MapUnitPolys
Feature type ⇔ Simple
Geometry type ⇔ Polygon
Has topology ⇔ TRUE
Feature count ⇔ 772
Spatial index ⇔ TRUE
Linear referencing ⇔ FALSE

XY rank ⇔ 2
Z rank ⇔ 2
Topology weight ⇔ 5.000000
Events on validation ⇔ FALSE
Participates in topology rules
6, 7, 8

ArcGIS Feature Class Properties ►
Feature class name ContactsAndFaults
Feature type ⇔ Simple
Geometry type ⇔ Polyline
Has topology ⇔ TRUE
Feature count ⇔ 1637
Spatial index ⇔ TRUE
Linear referencing ⇔ FALSE

XY rank ⇔ 1
Z rank ⇔ 1
Topology weight ⇔ 5.000000
Events on validation ⇔ FALSE
Participates in topology rules
1, 2, 3, 4, 5, 8

ArcGIS Feature Class Properties ►
Feature class name GeologicLines
Feature type ⇔ Simple
Geometry type ⇔ Polyline
Has topology ⇔ TRUE
Feature count ⇔ 35
Spatial index ⇔ TRUE
Linear referencing ⇔ FALSE

XY rank ⇔ 2
Z rank ⇔ 1
Topology weight ⇔ 5.000000
Events on validation ⇔ FALSE
Participates in topology rules
9, 10, 11, 12, 13

ArcGIS Feature Class Properties ►
Feature class name CartographicLines
Feature type ⇔ Simple
Geometry type ⇔ Polyline
Has topology ⇔ FALSE
Feature count ⇔ 74
Spatial index ⇔ TRUE
Linear referencing ⇔ FALSE

ArcGIS Feature Class Properties ►
Feature class name MapUnitLines
Feature type ⇔ Simple
Geometry type ⇔ Polyline
Has topology ⇔ FALSE
Feature count ⇔ 4
Spatial index ⇔ TRUE

Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name OrientationPoints
Feature type ⇌ Simple
Geometry type ⇌ Point
Has topology ⇌ FALSE
Feature count ⇌ 84
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name GeologicPoints
Feature type ⇌ Simple
Geometry type ⇌ Point
Has topology ⇌ FALSE
Feature count ⇌ 60
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name CartographicPoints
Feature type ⇌ Simple
Geometry type ⇌ Point
Has topology ⇌ FALSE
Feature count ⇌ 243
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name Quadrangle_Boundary
Feature type ⇌ Simple
Geometry type ⇌ Polygon
Has topology ⇌ FALSE
Feature count ⇌ 1
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name Summit_GeologicUnits_labels
Feature type ⇌ Annotation
Geometry type ⇌ Polygon
Has topology ⇌ FALSE
Feature count ⇌ 413
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

ArcGIS Feature Class Properties ►

Feature class name Summit_GeologicFeatures_labels
Feature type ⇌ Annotation
Geometry type ⇌ Polygon
Has topology ⇌ FALSE
Feature count ⇌ 120
Spatial index ⇌ TRUE
Linear referencing ⇌ FALSE

Data Quality ►

Scope of quality information ►

Resource level dataset

Data quality report - Conceptual consistency ►

Data quality measure reference

Measure description

This geodatabase is a composite geodataset that encapsulates the spatial and non-spatial data needed to depict and describe the geology of the map area, and to create the accompanying cartographic map product. The geodatabase conforms to the GeMS standard, except for deviations noted in the Lineage section of the metadata record.

Data quality report - Completeness omission ►

Data quality measure reference

Measure description

The geodatabase contains all the schema and attribute elements required by the GeMS standard, unless otherwise noted in the Lineage section of the metadata record.

Lineage ►

Lineage statement

GIS data was newly prepared specifically for this quadrangle by the Utah Geological Survey Geologic Mapping Program.

Process step ►

When the process occurred 2021-09-12 00:00:00

Description

The Utah Geological Survey (UGS) does not endorse any software products or manufacturers. Reference to any specific commercial product, process, or service by trade name, trademark, or otherwise, does not constitute endorsement or recommendation by the UGS. The UGS does not provide support for this digital dataset or any data files therein.

Process contact - originator

Individual's name UGS Geologic Mapping Program
Organization's name Utah Geological Survey
Contact's position GIS Analyst

Contact information ►

Phone
Voice (801) 537-3300
Address
Type physical
Delivery point 1594 W. North Temple
City Salt Lake City
Administrative area Utah
Postal code 84116-3154
Country US
Hours of service
Monday - Friday 8 am - 5 pm

Process step ►

When the process occurred 2025-11-13 00:00:00

Description

This GeMS submission has been validated as Level 2-compliant using the GeMS Validate Database tool called GeMS_ValidateDatabase_AGP2.py, 14 April 2025, version 2.12.13 for ArcGIS Pro with some deviations from GeMS standards. These deviations are described below. The decision to deviate was made, in most instances, because there was limited return on the time invested to comply precisely and/or it was unclear how to follow the standards more precisely. More details about the deviations or the reasons for them can be given at any time.

The deviations from full GeMS compliance or standards are as follows:

- "CartographicPoints": Non-standard feature class of symbols representing cartographic features such as line decorations for faults and folds.
- "GeologicPoints": Non-standard feature class of geology-related symbols such as mines, quarries, gravel pits, springs, etc.
- "SamplePoints": Non-standard feature class of sample points that are both geochemical and geochronological and, therefore, may have two reference sources on the table.
- Annotation feature classes: The UGS has a set of standards for geologic map publications that includes two annotation feature classes called "GeologicFeatures_labels" and "MapUnitPolys_labels". These feature classes have been included with this geodatabase.
- "ParagraphStyle" field: The UGS has a unique Style Guide for all publications, the basis of which is a Microsoft Word template that contains Styles. Unfortunately, these Styles are different from those used by the USGS. Therefore, determining the correct value to put in the field called "ParagraphStyle" would require a complete re-formatting of the UGS Style Guide and, more specifically, of the templates used for our publications. For this reason, we have populated all units with "DMUUnit1" to meet Level 3 compliance.
- "HierarchyKey" field: The UGS has a set of GIS standards that follows a particular schema and within this schema, there is a value representing the hierarchy of each unit called "UnitRank". This value puts the geologic units on any given map in semi-stratigraphic order (following the accompanying "booklet" or "pamphlet") similar to the intention of the "HierarchyKey" field values. Because it would take a significant amount of time to build "HierarchyKey" values by hand (please see the discussion about the "ParagraphStyle" above) the use of "UnitRank" as is our standard has been employed in this submission.
- "Symbol" field: The UGS has a set of symbology standards that are not the same as FGDC standard symbols. Because these are the symbols used in the original publication, for the GeMS conversion, the same symbology – that is, the UGS symbology – was used here. The value in the field called "Symbol" matches the name of the feature in the Layer file (.lyrx) that accompanies this submission.
- Left-hand rule: The UGS follows the left-hand rule when drawing lines. The Layer file (.lyrx) files will allow the user to symbolize the lines correctly, but if the FGDC symbology is used, the lines or the symbols themselves will need to be flipped such that the line decorations face the correct direction.
- "AreaFillRGB" field: Please see the discussion about the "Symbol" field above. Because we are not using FGDC symbology, filling out this field will take a significant amount of time. Additionally, this field seems unnecessary for the user because we have supplied a Layer file (.lyrx) with this submission.
- "AreaFillPatternDescription" field: Please see the discussions about the "Symbol" and "AreaFillRGB" fields above. Similar to the "AreaFillRGB" field, to populate the "AreaFillPatternDescription" field would take a significant amount of time. It also seems unnecessary for the user because we have supplied a Layer file (.lyrx) with this submission.
- "DataSourceID" field for GenericPoints and GeologicPoints, "OrientationSourceID" field for OrientationPoints, and "DataSourcesID" field for DescriptionOfMapUnits table: The length of these fields has been increased to 100 to accommodate more characters.
- "Rotation" field: Added to relevant feature class(es) for use in accurate cartographic representation of a variety of point features.
- "DipDirection" field: Added to OrientationPoints feature class to record the azimuthal direction of dip of some feature types; also used to rotate points for cartographic display on the final layout.
- "Strike" field: Added to OrientationPoints feature class to record the right-hand-rule azimuth of the strike of planar geologic features. This azimuth is perpendicular, in an anticlockwise direction, to the azimuth of dip direction of planar features, which is recorded in the "Azimuth" field.
- "Unnecessary map units in DescriptionOfMapUnits": The inclusion of these map units in the DescriptionOfMapUnits table is intentional because these units, while not present on the map (Plate 1), are present in other parts of the publication (e.g., cross sections, booklet, List of Map Units, and so on).

Process contact - originator

Individual's name UGS Geologic Mapping Program
Organization's name Utah Geological Survey
Contact's position GIS Analyst

Contact information ►

Phone
Voice (801) 537-3300
Address
Type physical
Delivery point 1594 W. North Temple
City Salt Lake City
Administrative area Utah
Postal code 84116-3154
Country US
Hours of service
Monday - Friday 8 am - 5 pm

Geoprocessing history ►

Process

Date 2026-04-27 14:58:32
Tool location c:\program files\arcgis\pro\Resources\ArcToolbox\toolboxes\Conversion Tools.tbx\FeatureClassToGeodatabase
Command issued
FeatureClassToGeodatabase Summit_MapBoundary;UtahStateBoundary "G:\Working Projects\Summit\Spatial\gdb\OFR-775DM_Summit7.5.gdb\GeologicMap"
Include in lineage when exporting metadata No

Distribution ►

Distribution format

Name ⇌ File Geodatabase Feature Dataset

Transfer options
Online source
Online location (URL) <https://doi.org/10.34191/OFR-775DM>

References ►

Aggregate Information

Association type larger work citation

Aggregate resource name ►

Title Interim Geologic Map of the Summit Quadrangle, Iron County, Utah
Publication date 2020-10-01 00:00:00

Edition 1.0

Series

Name OFR
Issue OFR-775DM

Responsible party - originator

Organization's name Utah Geological Survey

Contact information ►

Phone
Voice (801) 537-3300

Resource location online

Online location (URL) <https://doi.org/10.34191/OFR-775DM>

Metadata Details ►

Metadata language English (UNITED STATES)
Metadata character set utf8 - 8 bit UCS Transfer Format

Scope of the data described by the metadata dataset
Scope name ⇔ dataset

Last update ⇔ 2026-04-27

ArcGIS metadata properties

Metadata format ArcGIS 1.0
Metadata style FGDC CSDGM Metadata
Standard or profile used to edit metadata FGDC

Created in ArcGIS for the item 2022-02-21 12:45:02
Last modified in ArcGIS for the item 2026-04-27 14:42:09

Automatic updates

Have been performed Yes
Last update 2026-01-08 09:47:04

Metadata Contacts ►

Metadata contact - point of contact

Individual's name Natural Resources Map & Bookstore
Organization's name Utah Geological Survey
Contact's position Publisher and distributor

Contact information ►

Phone
Voice Local: (801) 537-3300
Voice Toll-free: (888) UTAH MAP (888) 882-4627

Address

Type physical
Delivery point 1594 W. North Temple
City Salt Lake City
Administrative area Utah
Postal code 84116-3154
Country US

Hours of service
Monday - Friday 10 am - 5 pm

Contact instructions

Visit our Natural Resources Map & Bookstore at <https://www.utahmapstore.com/> for online ordering instructions.

Metadata Maintenance ►

Maintenance

Update frequency not planned

Metadata Constraints ►

Constraints

Limitations of use

This open-file release makes information available to the public that has undergone only minimal peer review and may not conform to Utah Geological Survey technical, editorial, or policy standards. The map may be incomplete, and inconsistencies, errors, and omissions have not been resolved. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding the suitability of this product for a particular use, and does not guarantee accuracy or completeness of the data. The Utah Department of Natural Resources, Utah Geological Survey, shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to claims by users of this product. For use at 1:24,000 scale.

This geologic map was funded by the Utah Geological Survey and the U.S. Geological Survey National Cooperative Geologic Mapping Program under STATEMAP award number G21AC10880 (2020–2022). The views and conclusions contained in this document are those of the author and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the

U.S. Government.

Legal constraints

Limitations of use

See access and use constraints information.