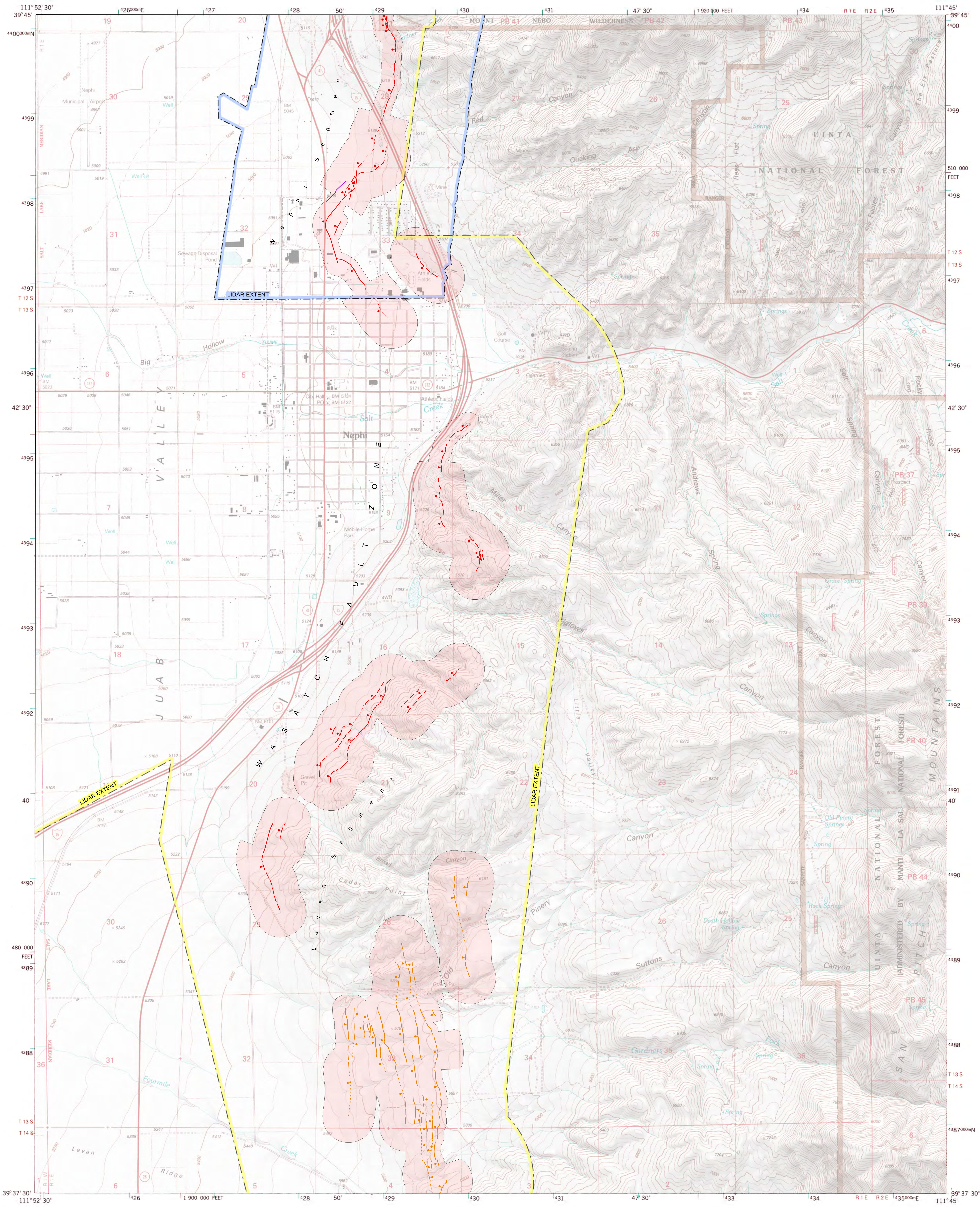
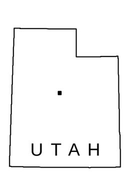
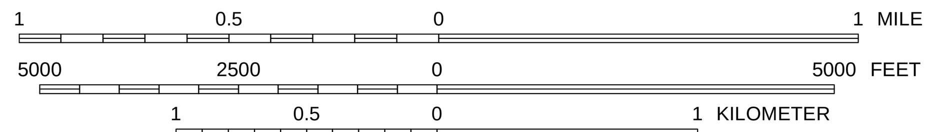


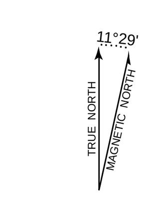


QUADRANGLE LOCATION

SCALE 1:24,000



CONTOUR INTERVAL 40 FEET
SUPPLEMENTAL CONTOUR INTERVAL 20 FEET



APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Nephi 7.5' Quadrangle (2001)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
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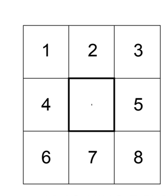
SURFACE FAULT RUPTURE HAZARD MAP OF THE NEPHI QUADRANGLE, JUAB COUNTY, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015



1. Slate Jack Canyon
2. Mona
3. Nebo Basin
4. Sugarloaf
5. Fountain Green North
6. Juab
7. Levan
8. Fountain Green South

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

2013-2014 LiDAR Extent: 0.5-meter Wasatch Front bare earth Light Detection and Ranging (LiDAR) elevation data, available from the Utah Automated Geographic Reference Center.

2007-2008 LiDAR Extent: 0.5-meter bare earth LiDAR elevation data, available from EarthScope.

SURFACE FAULT RUPTURE HAZARD CATEGORIES

Holocene-active fault (movement within the past 11,700 years) or suspected Holocene-active fault: Surface-fault-rupture hazard investigations recommended for all structures intended for human occupancy and all International Building Code (IBC; International Code Council, 2012) Risk Category IIa, IIb, III, and IV structures (see Lund and others, in review). Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace.

Late Quaternary-active fault (movement within the past 130,000 years) or suspected Late Quaternary-active fault: Surface-fault-rupture hazard investigations recommended for all IBC Risk Category IIb, III, and IV structures (see Lund and others, in review). Studies for IBC Risk Category IIa and other structures for human occupancy remain prudent, but should be based on an assessment of whether risk-reduction measures are justified by weighing the probability of occurrence against the risk to lives and potential economic loss. Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace.

Quaternary-active fault (movement within the past 2,600,000 years) or suspected Quaternary-active fault: Surface-fault-rupture hazard investigations recommended for all IBC Risk Category III and IV structures (see Lund and others, in review). Studies for IBC Risk Category IIa and other structures for human occupancy remain prudent because a low likelihood of surface faulting still exists. Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace. None currently mapped within this quadrangle.

Other lineaments, unknown activity/source: Other lineaments and traces mapped on LiDAR.

Surface-fault-rupture hazard special-study area: For well-defined faults, special-study area extends 500 feet on the downthrown side and 250 feet on the upthrown side of each fault. For moderately well-located or buried/inferred faults, special-study area extends 1000 feet on each side of the suspected trace of each fault (Lund and others, in review). For small moderately well-defined or buried/inferred faults that are between and on-trend with well-defined faults, and less than 1000 feet in length, the well-defined fault special-study width is used.

REFERENCES

Black, B.D., Hecker, S., Jarva, J.L., Hylland, M.D., Christenson, G.E., and McDonald, G.N., 2003, Quaternary fault and fold database and map of Utah: Utah Geological Survey Map 193DM, 1:500,000 scale, CD.

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Utah Automated Geographic Reference Center, 2013-2014, 0.5-meter Wasatch Front LiDAR elevation data: Online, Utah Automated Geographic Reference Center, State Geographic Information Database, http://gis.utah.gov/data/elevation-terrain-data/2013-2014-lidar/.

USING THIS MAP

This map shows potentially active faults on the Nephi quadrangle along which surface faulting may occur. A special-study area is shown around each fault. Within each area, the UGS recommends a site-specific, surface-fault-rupture hazard investigation be performed prior to development. Site-specific geotechnical/geologic-hazard investigations can resolve uncertainties inherent in the generalized map scale and help ensure safety by identifying the need for fault setbacks. This map is not intended for use at scales other than 1:24,000; it is our opinion that the inventory of potentially active faults shown on this map is likely complete at this scale. However, smaller faults may not have been detected during mapping or are concealed beneath young geologic deposits. Additionally, concealed and approximately located faults by definition lack a clearly identifiable surface trace; therefore, their locations are approximate. Site-specific fault-trenching investigations should be preceded by a careful field evaluation of the site to identify the surface trace of the fault as well as other faults and fault-related features not evident at 1:24,000 scale.

We focused on mapping Wasatch fault zone traces (Nephi, Levan, and Fayette segments) and other faults within the LiDAR data extent using 0.5-meter LiDAR, black-and-white oblique aerial photography from the Woodward-Lundgren & Associates Wasatch fault investigation (in Bowman and others, 2009), and previous mapping (see Sources of Geologic Data below). Fault traces outside of the LiDAR extent are from the *Quaternary Fault and Fold Database and Map of Utah* (Black and others, 2003) and the Levan and Fayette surficial geologic map (Hylland and Machette, 2008). Bedrock faults with no documented Quaternary movement were not included, but could represent an unlikely source of surface-fault-rupture hazard. LiDAR-derived fault traces were mapped at 1:10,000 scale; however, all traces are shown on this map at 1:24,000 scale. The Salt Creek-Biglows Canyon area marks the approximate boundary of the Levan-Nephi segments based on changes in range-front geometry.

SOURCES OF GEOLOGIC DATA

1. Biek, R.F., 1991, Provisional geologic map of the Nephi quadrangle, Juab County, Utah: Utah Geological Survey Map 137, 21 p., 2 plates, scale 1:24,000.

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7. Mattox, S.R., 1987, Provisional geologic map of the Hells Kitchen Canyon SE quadrangle, Sanpete County, Utah: Utah Geological and Mineral Survey Map 98, 17 p., 2 plates, scale 1:24,000.

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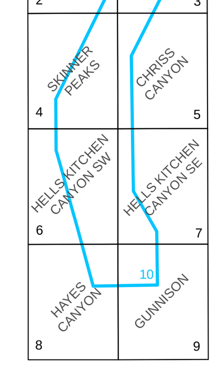
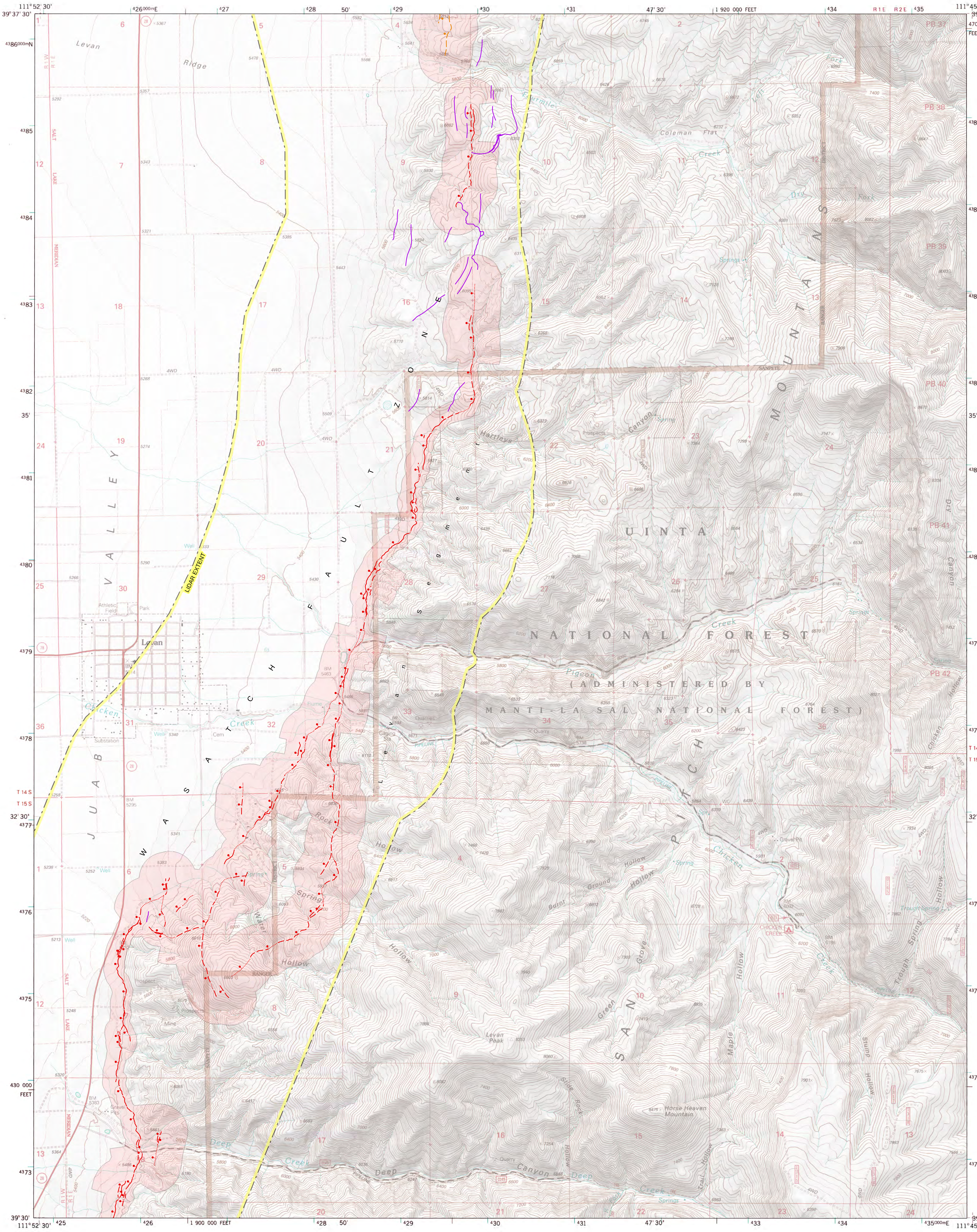
11. Harty, K.M, Mulvey, W.E., and Machette, M.N., 1997, Surficial geologic map of the Nephi segment of the Wasatch fault zone, eastern Juab County, Utah: Utah Geological Survey Map 170, 14 p. pamphlet, 1 plate, scale 1:50,000.



GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE

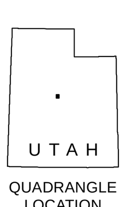
UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources

Plate 2
Utah Geological Survey Open-File Report 640
Surface Fault Rupture Hazard Map of the Levan Quadrangle



This open-file release makes information available to the public during the review and production period necessary for a formal UGS publication. The map may be incomplete, and inconsistencies, errors, and omissions have not been resolved. While the document is in the review process, it may not conform to UGS standards; therefore, it may be premature for an individual or group to take actions based on its contents. Although this product represents the work of professional scientists, the Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding its suitability for a particular use. 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 only.

This map is a plot of geographic information system (GIS) files created to visually represent the content of the GIS data files. This preliminary map contains features that do not meet UGS cartographic standards.



QUADRANGLE LOCATION

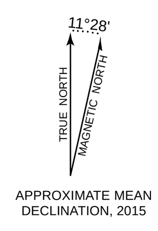
SCALE 1:24,000

1 0.5 0 1 MILE

5000 2500 0 5000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
SUPPLEMENTAL CONTOUR INTERVAL 20 FEET



APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Levan 7.5' Quadrangle (2001)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
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SURFACE FAULT RUPTURE HAZARD MAP OF THE LEVAN QUADRANGLE, JUAB COUNTY, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015

1	2	3
4		5
6	7	8

1. Sugarloaf
2. Nephi
3. Fountain Green North
4. Juab
5. Fountain Green South
6. Skinner Peaks
7. Chriss Canyon
8. Wales

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

2013-2014 LiDAR Extent: 0.5-meter Wasatch Front bare earth Light Detection and Ranging (LiDAR) elevation data, available from the Utah Automated Geographic Reference Center.

SURFACE FAULT RUPTURE HAZARD CATEGORIES

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USING THIS MAP

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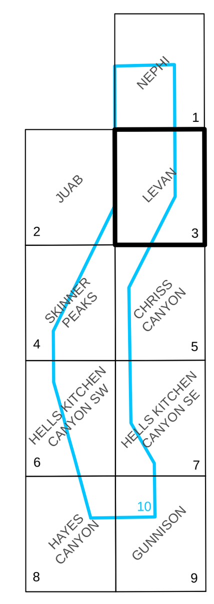
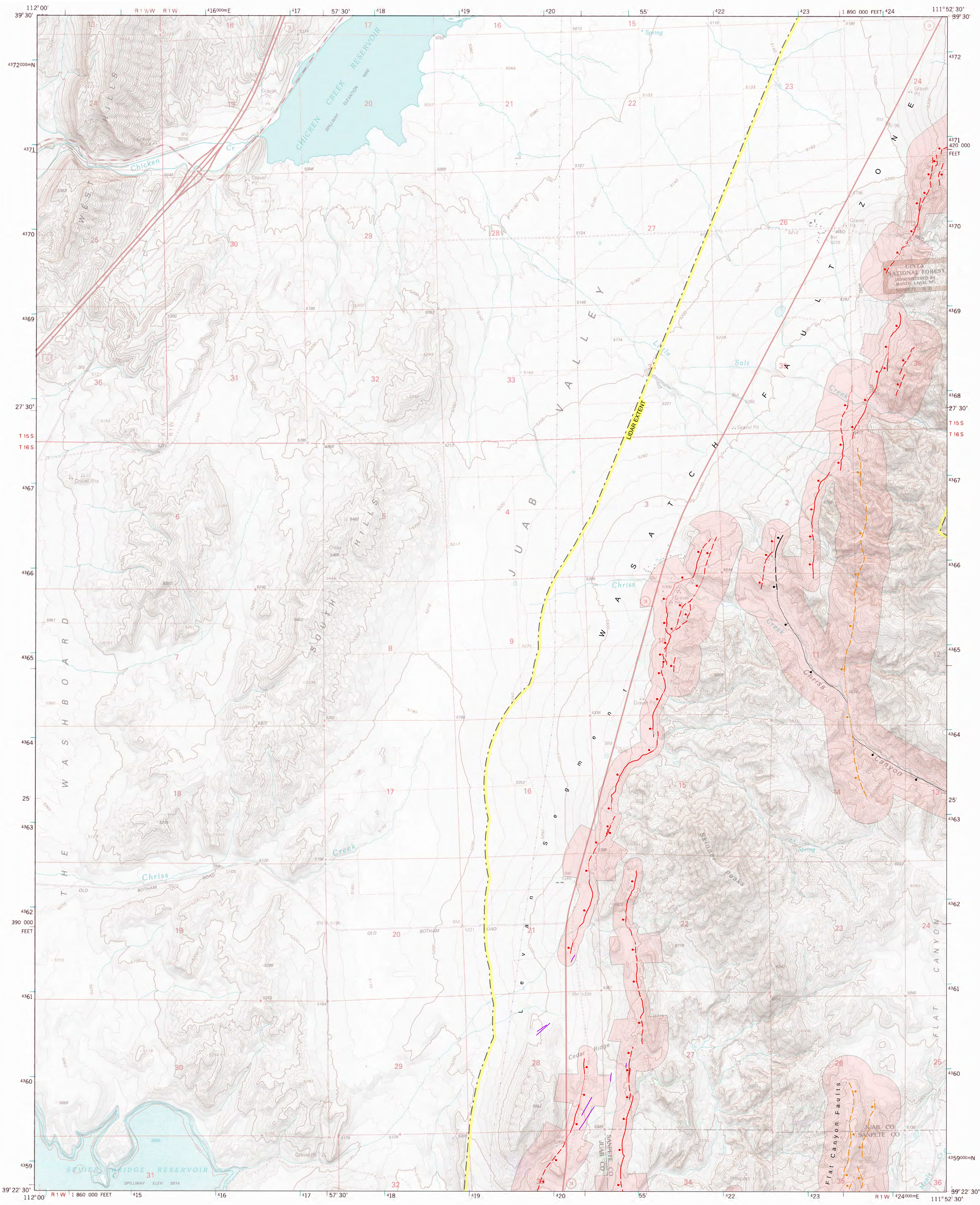
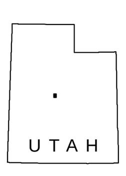


GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE





QUADRANGLE LOCATION

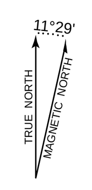
SCALE 1:24,000

1 0.5 0 1 MILE

5000 2500 0 5000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
SUPPLEMENTAL CONTOUR INTERVAL 10 FEET



APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Skinner Peaks 7.5' Quadrangle (2001)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
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SURFACE FAULT RUPTURE HAZARD MAP OF THE SKINNER PEAKS QUADRANGLE, JUAB AND SANPETE COUNTIES, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015

1	2	3
4		5
6	7	8

1. Sage Valley
2. Juab
3. Levan
4. Mills
5. Chriss Canyon
6. Scipio North
7. Hells Kitchen SW
8. Hells Kitchen SE

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

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USING THIS MAP

This map shows potentially active faults on the Skinner Peaks quadrangle along which surface faulting may occur. A special-study area is shown around each fault. Within each area, the UGS recommends a site-specific, surface-fault-rupture hazard investigation be performed prior to development. Site-specific geotechnical/geologic-hazard investigations can resolve uncertainties inherent in the generalized map scale and help ensure safety by identifying the need for fault setbacks. This map is not intended for use at scales other than 1:24,000; it is our opinion that the inventory of potentially active faults shown on this map is likely complete at this scale. However, smaller faults may not have been detected during mapping or are concealed beneath young geologic deposits. Additionally, concealed and approximately located faults by definition lack a clearly identifiable surface trace; therefore, their locations are approximate. Site-specific fault-trenching investigations should be preceded by a careful field evaluation of the site to identify the surface trace of the fault as well as other faults and fault-related features not evident at 1:24,000 scale.

We focused on mapping Wasatch fault zone traces (Levan and Fayette segments) and other faults within the LiDAR data extent using 0.5-meter LiDAR, black-and-white oblique aerial photography from the Woodward-Lundgren & Associates Wasatch fault investigation (in Bowman and others, 2009), and previous mapping (see Sources of Geologic Data below). Fault traces outside of the LiDAR extent are from the *Quaternary Fault and Fold Database and Map of Utah* (Black and others, 2003) and the Levan and Fayette surficial geologic map (Hylland and Machette, 2008). Bedrock faults with no documented Quaternary movement were not included, but could represent an unlikely source of surface-fault-rupture hazard. LiDAR-derived fault traces were mapped at 1:10,000 scale; however, all traces are shown on this map at 1:24,000 scale. Flat Canyon area marks Levan-Fayette segment boundary (Hylland and Machette, 2008).

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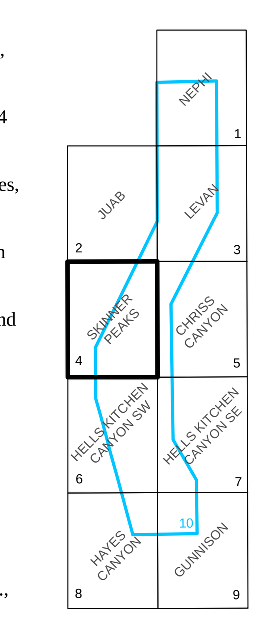
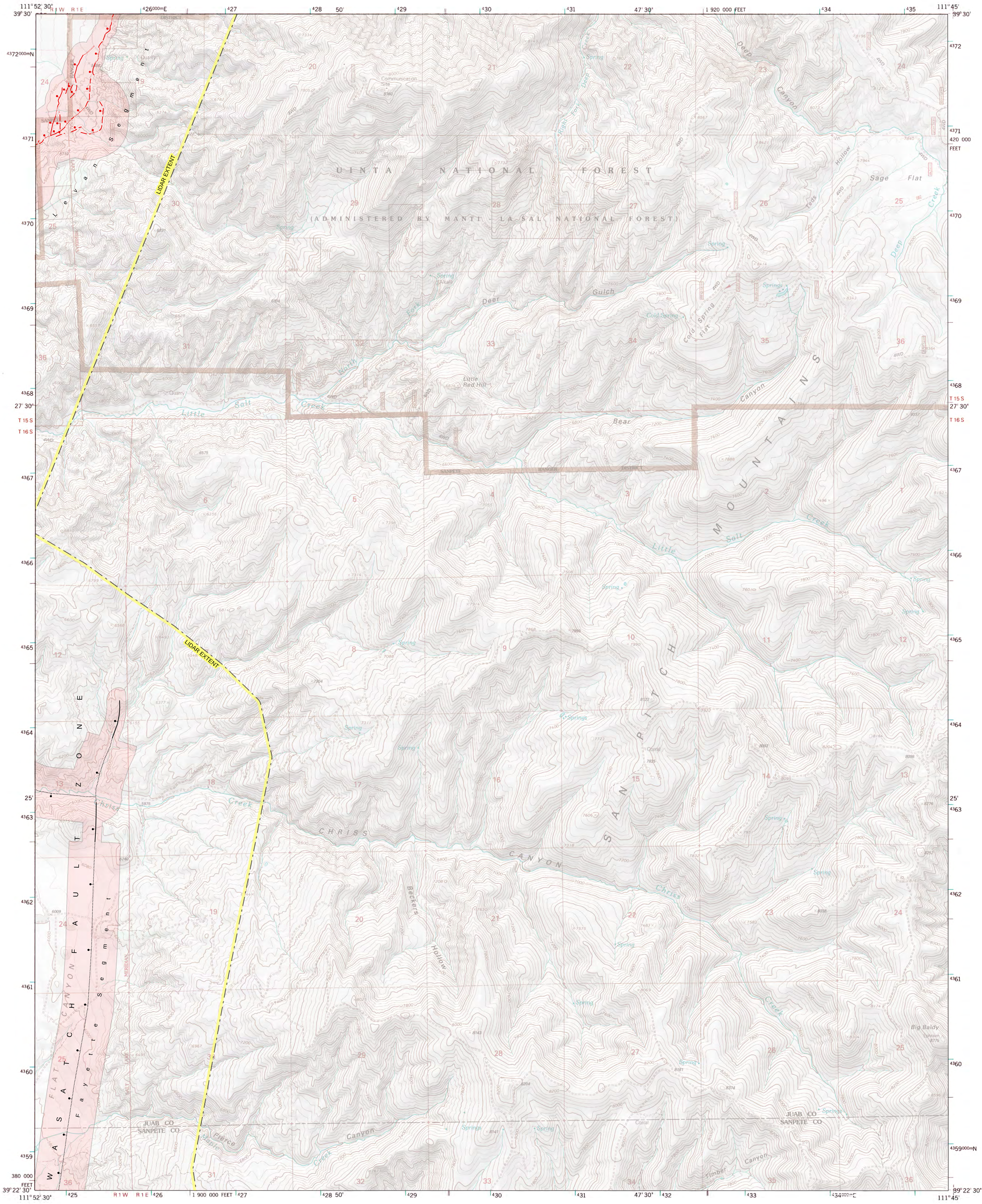
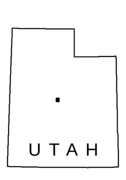


GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE





QUADRANGLE LOCATION

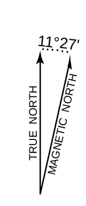
SCALE 1:24,000

1 0.5 0 1 MILE

5000 2500 0 5000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET



APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Chriss Canyon 7.5' Quadrangle (2001)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
GIS and Cartography: Adam I. Hiscock

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P.O. Box 146100, Salt Lake City, UT 84114-6100
(801) 537-3300
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SURFACE FAULT RUPTURE HAZARD MAP OF THE CHRISS CANYON QUADRANGLE, JUAB AND SANPETE COUNTIES, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015

1	2	3
4		5
6	7	8

1. Juab
2. Levan
3. Fountain Green South
4. Skinner Peaks
5. Wales
6. Hells Kitchen SW
7. Hells Kitchen SE
8. Manti

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

2013-2014 LiDAR Extent: 0.5-meter Wasatch Front bare earth Light Detection and Ranging (LiDAR) elevation data, available from the Utah Automated Geographic Reference Center.

SURFACE FAULT RUPTURE HAZARD CATEGORIES

Holocene-active fault (movement within the past 11,700 years) or suspected Holocene-active fault: Surface-fault-rupture hazard investigations recommended for all structures intended for human occupancy and all International Building Code (IBC; International Code Council, 2012) Risk Category IIa, IIb, III, and IV structures (see Lund and others, in review). Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace.

Late Quaternary-active fault (movement within the past 130,000 years) or suspected Late Quaternary-active fault: Surface-fault-rupture hazard investigations recommended for all IBC Risk Category IIb, III, and IV structures (see Lund and others, in review). Studies for IBC Risk Category IIa and other structures for human occupancy remain prudent, but should be based on an assessment of whether risk-reduction measures are justified by weighing the probability of occurrence against the risk to lives and potential economic loss. Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace. None currently mapped within this quadrangle.

Quaternary-active fault (movement within the past 2,600,000 years) or suspected Quaternary-active fault: Surface-fault-rupture hazard investigations recommended for all IBC Risk Category III and IV structures (see Lund and others, in review). Studies for IBC Risk Category IIa and other structures for human occupancy remain prudent because a low likelihood of surface faulting still exists. Ball and bar on downthrown side of fault. Solid line indicates well-defined fault trace, dashed line indicates moderately well-defined fault trace, and dotted line indicates buried or inferred fault trace.

Other lineaments, unknown activity/source: Other lineaments and traces mapped on LiDAR. None currently mapped within this quadrangle.

Surface-fault-rupture hazard special-study area: For well-defined faults, special-study area extends 500 feet on the downthrown side and 250 feet on the upthrown side of each fault. For moderately well-located or buried/inferred faults, special-study area extends 1000 feet on each side of the suspected trace of each fault (Lund and others, in review). For small moderately well-defined or buried/inferred faults that are between and on-trend with well-defined faults, and less than 1000 feet in length, the well-defined fault special-study width is used.

REFERENCES

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USING THIS MAP

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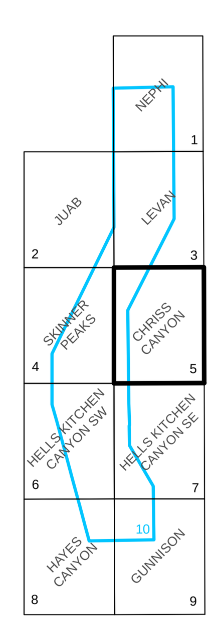
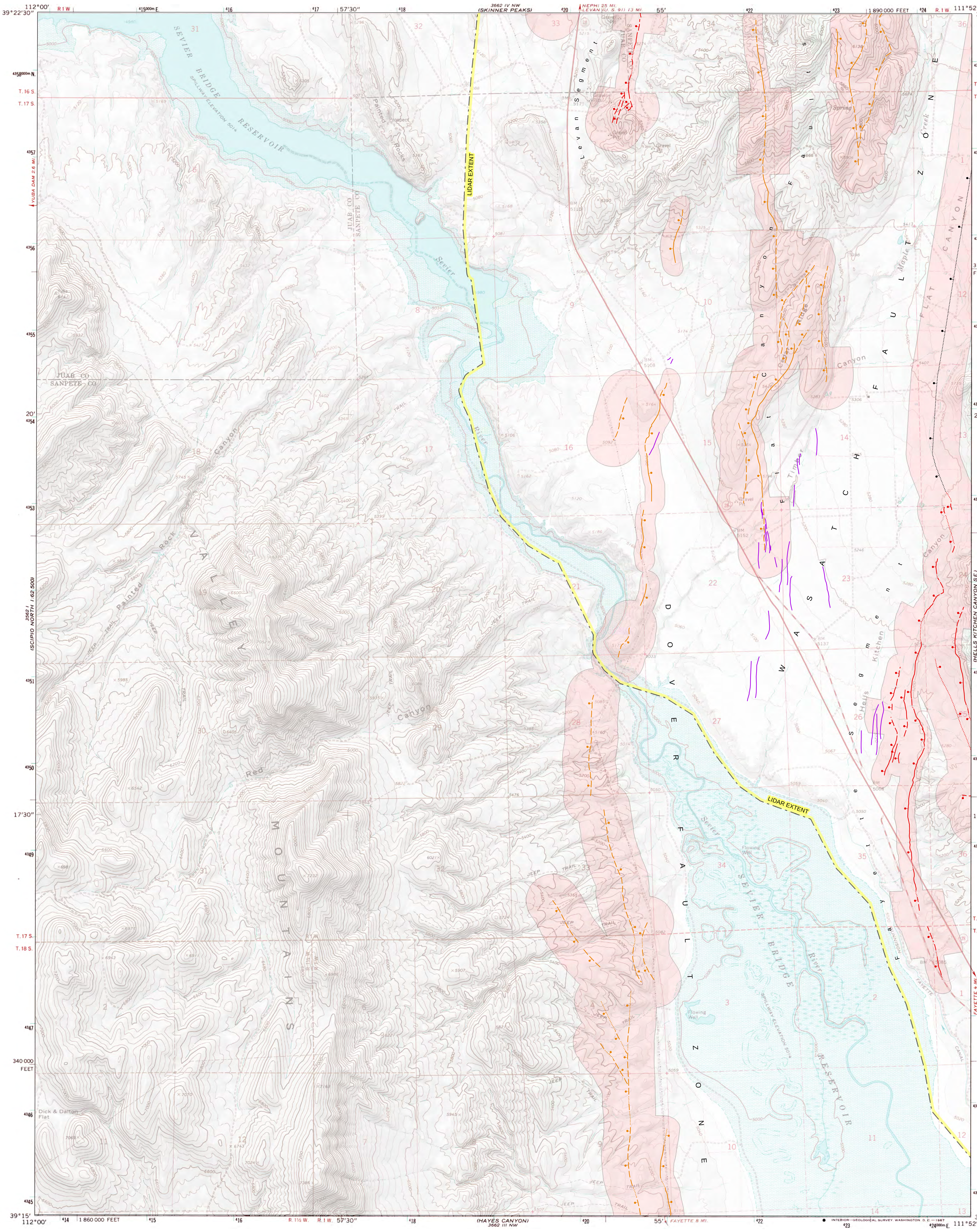


GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE



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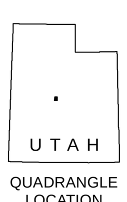
This map is a plot of geographic information system (GIS) files created to visually represent the content of the GIS data files. This preliminary map contains features that do not meet UGS cartographic standards.



QUADRANGLE LOCATION

SCALE 1:24,000

1 0.5 0 1 MILE

5000 2500 0 5000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
SUPPLEMENTAL CONTOUR INTERVAL 20 FEET

APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Hells Kitchen Canyon SW 7.5' Quadrangle (1965)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
GIS and Cartography: Adam I. Hiscock

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SURFACE FAULT RUPTURE HAZARD MAP OF THE HELLS KITCHEN CANYON SW QUADRANGLE, JUAB AND SANPETE COUNTIES, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015

1	2	3
4		5
6	7	8

1. Mills
2. Skinner Peaks
3. Chriss Canyon
4. Scipio North
5. Hells Kitchen Canyon SE
6. Scipio South
7. Hayes Canyon
8. Gunnison

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

2013-2014 LiDAR Extent: 0.5-meter Wasatch Front bare earth Light Detection and Ranging (LiDAR) elevation data, available from the Utah Automated Geographic Reference Center.

SURFACE FAULT RUPTURE HAZARD CATEGORIES

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USING THIS MAP

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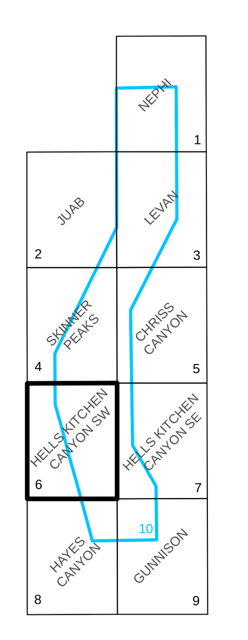
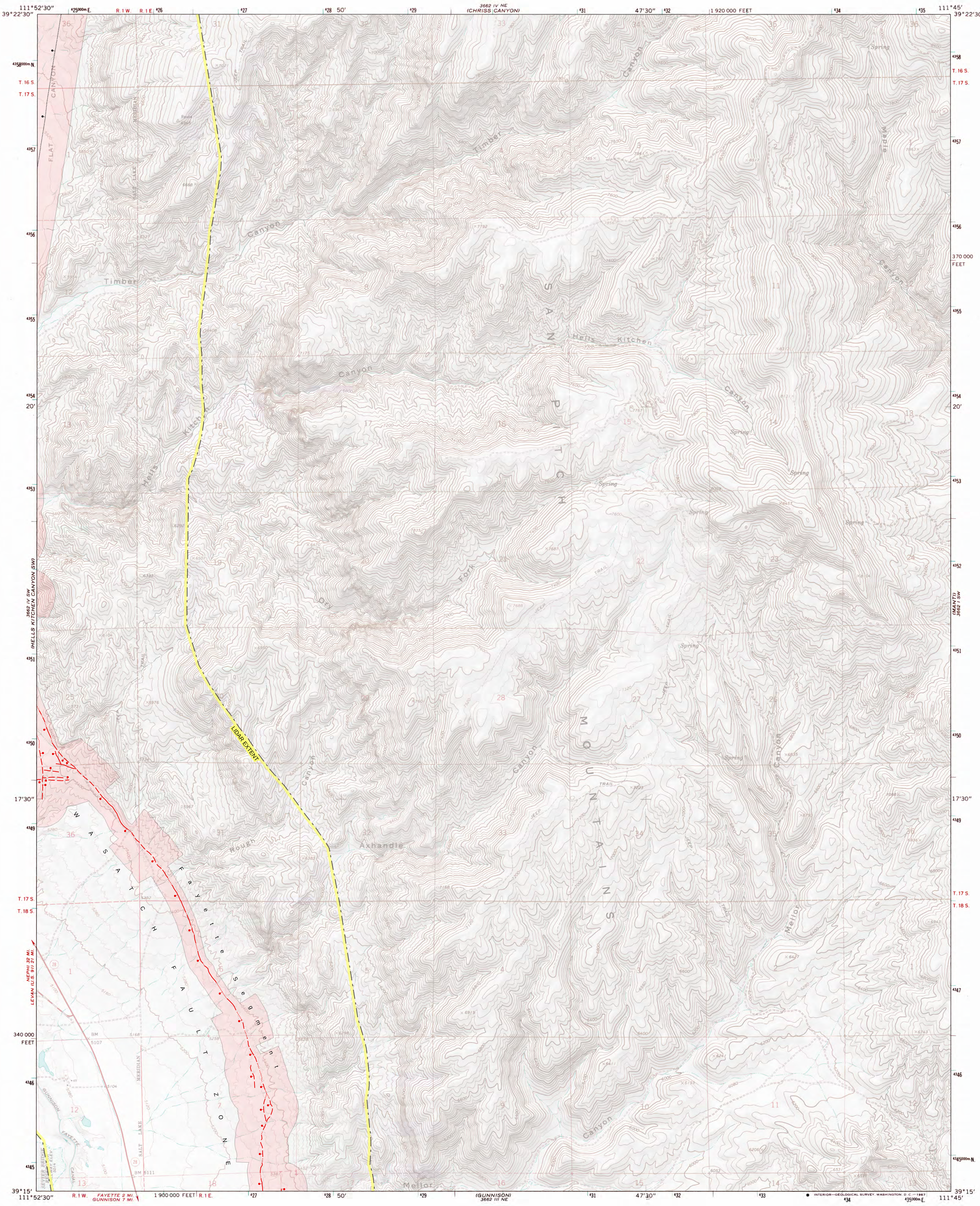


GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE



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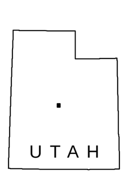

QUADRANGLE LOCATION

SCALE 1:24,000

1 0.5 0 1 MILE
5000 2500 0 5000 FEET
1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
SUPPLEMENTAL CONTOUR INTERVAL 20 FEET

11°26'
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Hells Kitchen Canyon SE 7.5' Quadrangle (1965)
Projection: UTM Zone 12
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by

Adam I. Hiscock and Michael D. Hylland

2015

1	2	3
4		5
6	7	8

1. Skinner Peaks
2. Chriss Canyon
3. Wales
4. Hells Kitchen SW
5. Manti
6. Hayes Canyon
7. Gunnison
8. Sterling

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

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SURFACE FAULT RUPTURE HAZARD CATEGORIES

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REFERENCES

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Utah Automated Geographic Reference Center, 2013-2014, 0.5-meter Wasatch Front LiDAR elevation data: Online, Utah Automated Geographic Reference Center, State Geographic Information Database, http://gis.utah.gov/data/elevation-terrain-data/2013-2014-lidar/.

USING THIS MAP

This map shows potentially active faults on the Hells Kitchen Canyon SE quadrangle along which surface faulting may occur. A special-study area is shown around each fault. Within each area, the UGS recommends a site-specific, surface-fault-rupture hazard investigation be performed prior to development. Site-specific geotechnical/geologic-hazard investigations can resolve uncertainties inherent in the generalized map scale and help ensure safety by identifying the need for fault setbacks. This map is not intended for use at scales other than 1:24,000; it is our opinion that the inventory of potentially active faults shown on this map is likely complete at this scale. However, smaller faults may not have been detected during mapping or are concealed beneath young geologic deposits. Additionally, concealed and approximately located faults by definition lack a clearly identifiable surface trace; therefore, their locations are approximate. Site-specific fault-trenching investigations should be preceded by a careful field evaluation of the site to identify the surface trace of the fault as well as other faults and fault-related features not evident at 1:24,000 scale.

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SOURCES OF GEOLOGIC DATA

1. Biek, R.F., 1991, Provisional geologic map of the Nephi quadrangle, Juab County, Utah: Utah Geological Survey Map 137, 21 p., 2 plates, scale 1:24,000.
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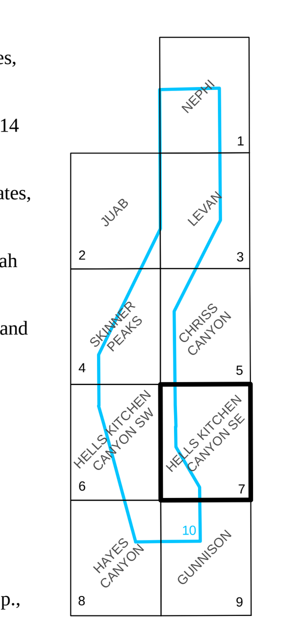
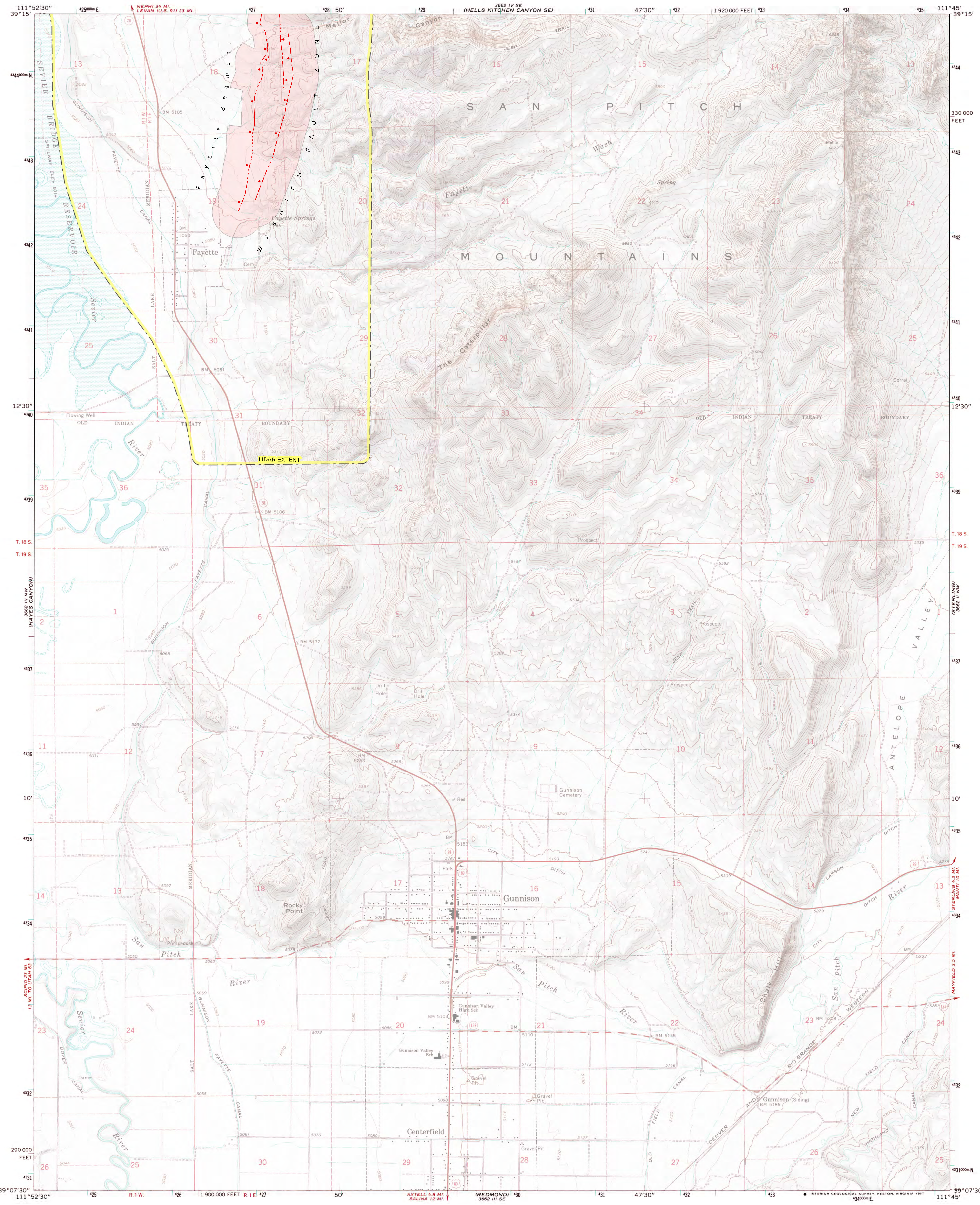


GEOLOGIC MAPS COVERING THE LEVAN AND FAYETTE SEGMENTS OF THE WASATCH FAULT ZONE

UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources



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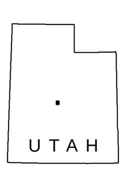
This map is a plot of geographic information system (GIS) files created to visually represent the content of the GIS data files. This preliminary map contains features that do not meet UGS cartographic standards.



QUADRANGLE LOCATION

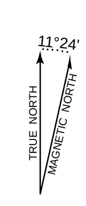
SCALE 1:24,000

1 0.5 0 1 MILE

5000 2500 0 5000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
SUPPLEMENTAL CONTOUR INTERVAL 10 FEET



APPROXIMATE MEAN DECLINATION, 2015

Base from USGS Gunnison 7.5' Quadrangle (1966)
Projection: UTM Zone 12
Datum: NAD 1927
Shaded topography generated from 10-meter USGS digital elevation data

LiDAR surface fault mapping: Adam I. Hiscock and Michael D. Hylland
GIS and Cartography: Adam I. Hiscock

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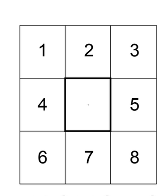
(801) 537-3300
geology.utah.gov

SURFACE FAULT RUPTURE HAZARD MAP OF THE GUNNISON QUADRANGLE, SANPETE COUNTY, UTAH

by

Adam I. Hiscock and Michael D. Hylland

2015



1. Hells Kitchen SW
2. Hells Kitchen SE
3. Manti
4. Hayes Canyon
5. Sterling
6. Redmond Canyon
7. Redmond
8. Mayfield

ADJOINING 7.5' QUADRANGLE NAMES

EXPLANATION

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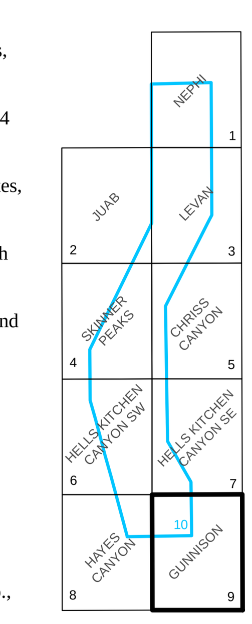

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