NMBGMR Open-File Geologic Map 303
Last Modified July 2022

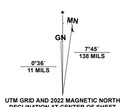
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

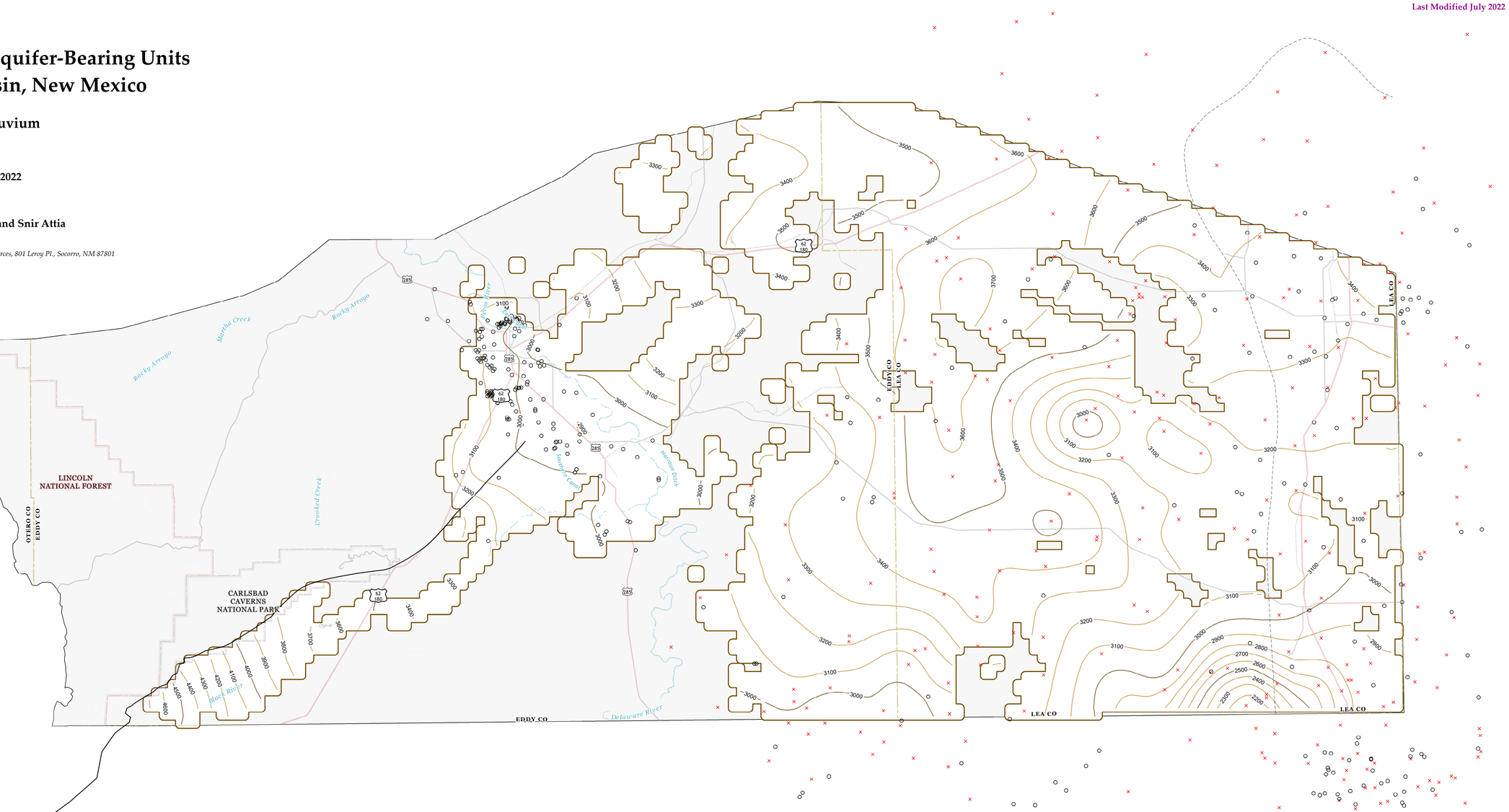
Base of Alluvium

September 2022

by
Marissa M. Fichera and Snir Attia

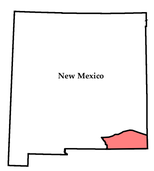
New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801





Base map from U.S. Geological Survey 2021.
North American Datum of 1983 (NAD83)
Universal Transverse Mercator, Zone 13S

Roads..... U.S. Census Bureau, 2015–2016
Names..... GNIS, 2018
Hydrography..... National Hydrography Dataset, 2019
Contours..... IFSAR 4.5 m Digital Terrain Model, 2008
Wetlands..... FWS National Wetlands Inventory 1977–2018



Project Area Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and A. R. Baca

1:250,000

5 2.5 0 5 10 15 20 25 Mile

20000 0 20000 40000 60000 80000 100000 Feet

5 2.5 0 5 10 15 20 25 Kilometer

Contour Interval 20 Feet

North American Vertical Datum of 1988

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 303

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act (Fund Number: G21AC10770), administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, (Dr. Nelia W. Dunbar, *Director and State Geologist*; Dr. J. Michael Timmons, *Assoc. Director for Mapping Programs*).

Explanation of Map Symbols

- Geophysical data collection locality
- Water well, type unspecified

DRAFT

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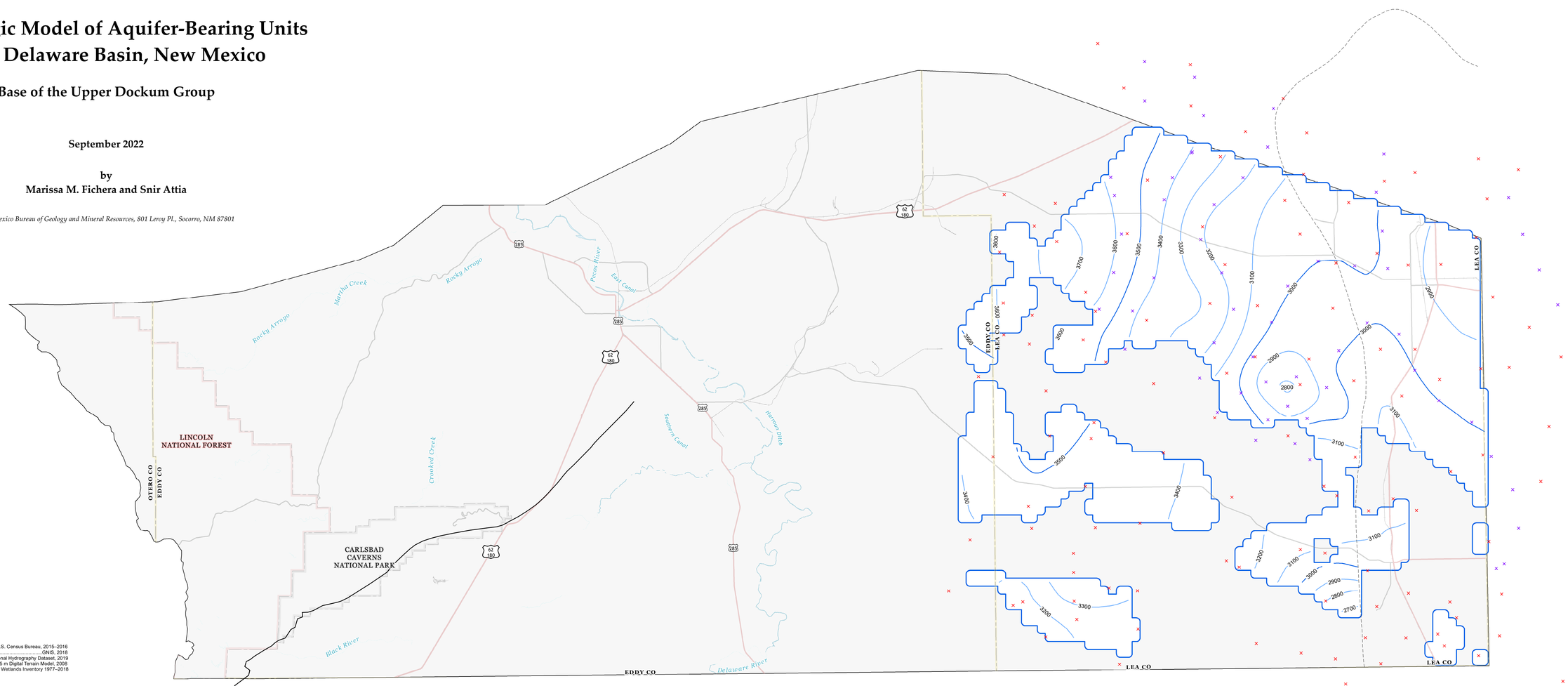
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

Base of the Upper Dockum Group

September 2022

by
Marissa M. Fichera and Snir Attia

New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801



Base map from U.S. Geological Survey 2021.
North American Datum of 1983 (NAD83)
Universal Transverse Mercator, Zone 13S

Roads.....U.S. Census Bureau, 2015–2016
Names.....GNIS, 2018
Hydrography.....National Hydrography Dataset, 2019
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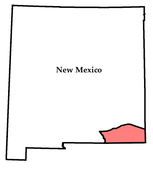
Wetlands.....FWS National Wetlands Inventory 1977–2016



Project Area Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
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Socorro, New Mexico
87801-4796

[575] 835-5490

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1:250,000

5 2.5 0 5 10 15 20 25 Mile

20000 0 20000 40000 60000 80000 100000 Feet

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Contour Interval 20 Feet

North American Vertical Datum of 1988

New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 303

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Explanation of Map Symbols

- Geophysical data collection locality
- Outcrop point as structural control point (2nd surface)

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Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and A. R. Baca

NMBGMR Open-File Geologic Map 303
Last Modified July 2022

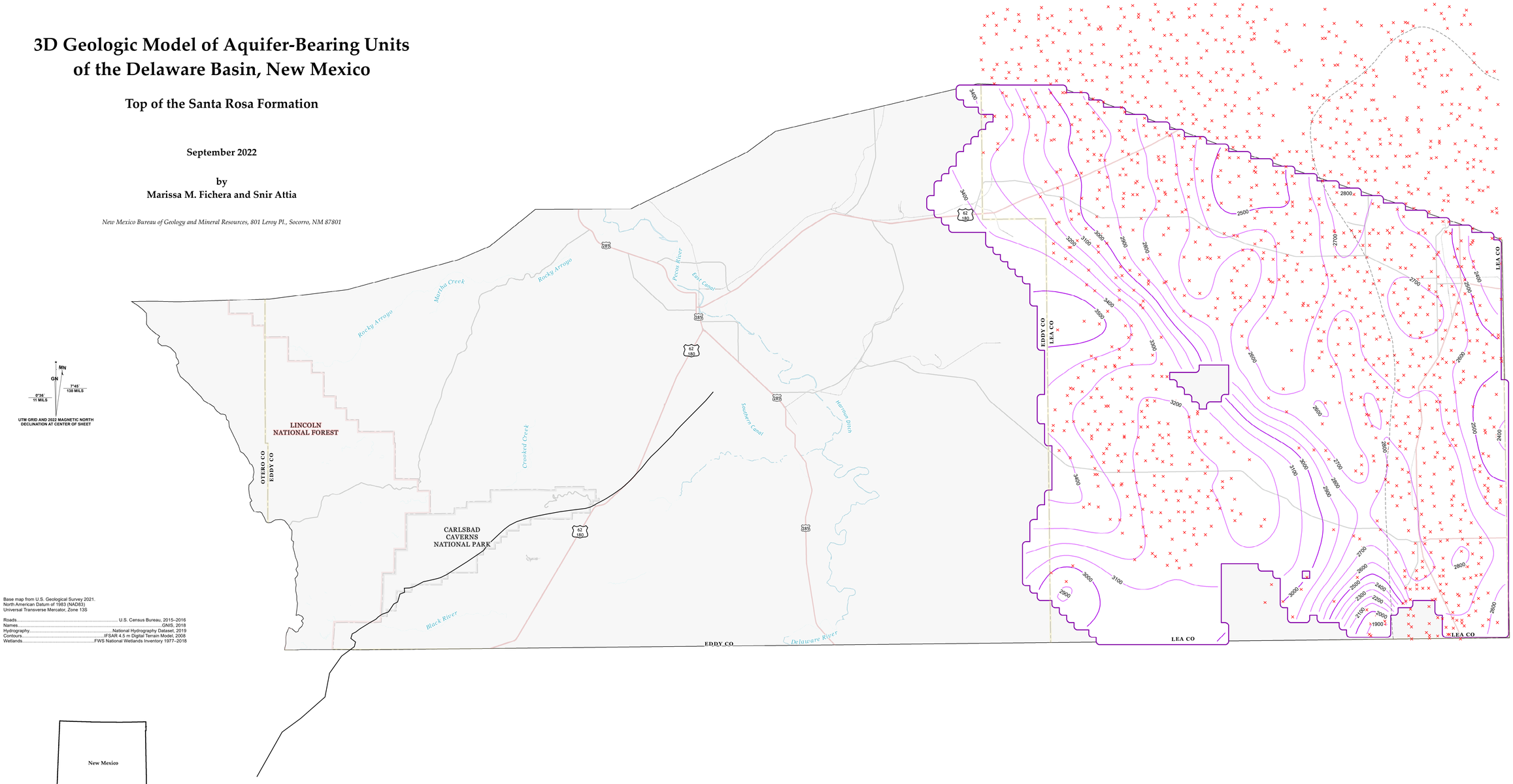
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

Top of the Santa Rosa Formation

September 2022

by
Marissa M. Fichera and Snir Attia

New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801



Base map from U.S. Geological Survey 2021.
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Universal Transverse Mercator, Zone 13S

Roads.....U.S. Census Bureau, 2015–2016
Names.....GNIS, 2018
Hydrography.....National Hydrography Dataset, 2019
Contours.....IFSAR 4.5 m Digital Terrain Model, 2008
Wetlands.....FWS National Wetlands Inventory 1977–2018

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New Mexico Tech
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[575] 835-5490

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Contour Interval 20 Feet

North American Vertical Datum of 1988

Explanation of Map Symbols

× Geophysical data collection locality

Comments to Map Users

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New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 303

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Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and A. R. Baca

NMBGMR Open-File Geologic Map 303
Last Modified July 2022

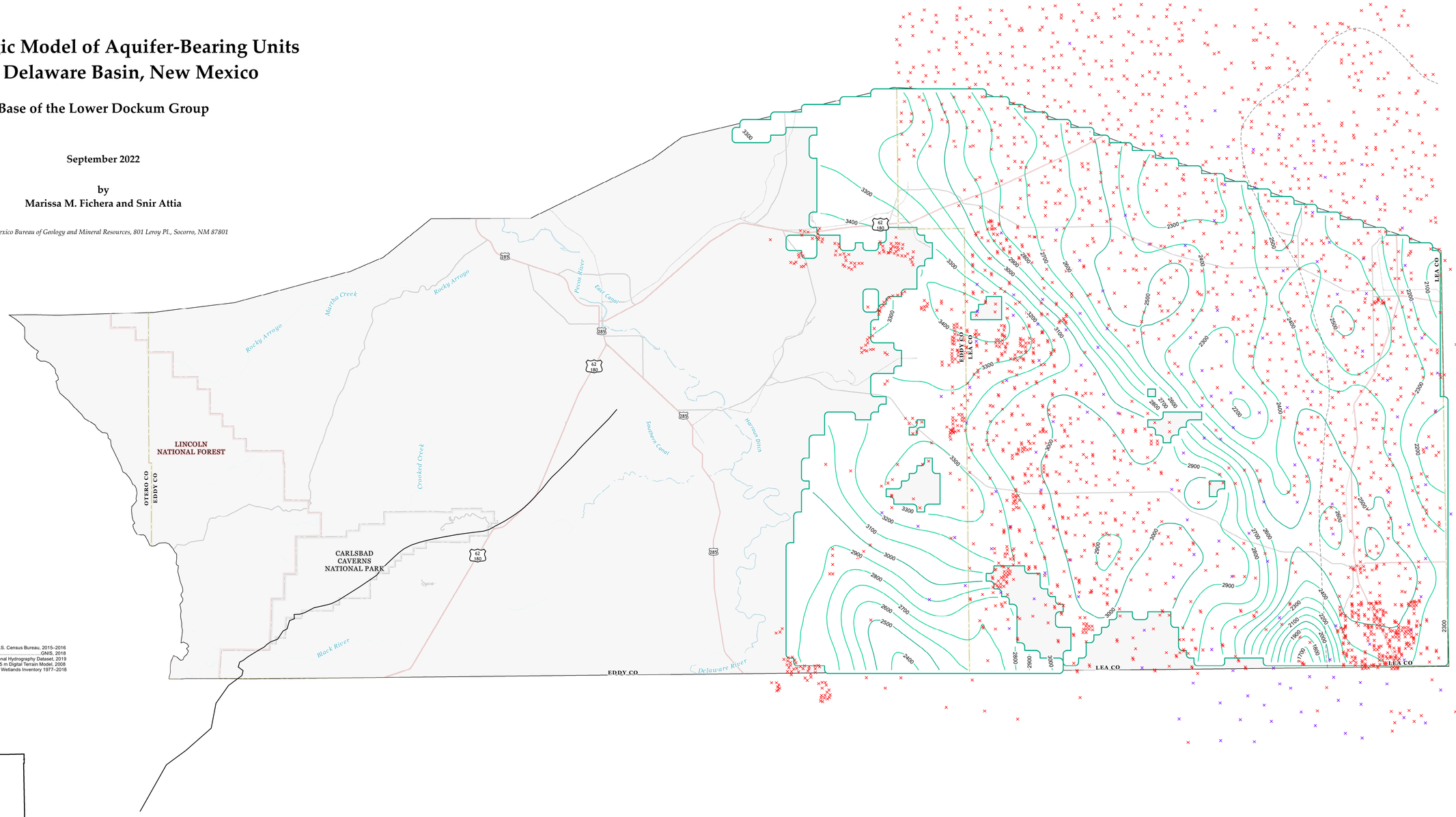
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

Base of the Lower Dockum Group

September 2022

by
Marissa M. Fichera and Snir Attia

New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801



Base map from U.S. Geological Survey 2021.
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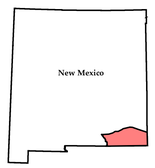

Project Area Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

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Contour Interval 20 Feet

North American Vertical Datum of 1988

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Open-File Geologic Map 303

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Explanation of Map Symbols

- Geophysical data collection locality
- Outcrop point as structural control point (2nd surface)

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NMBGMR Open-File Geologic Map 303
Last Modified July 2022

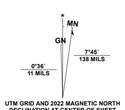
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

Base of the Dewey Lake Formation

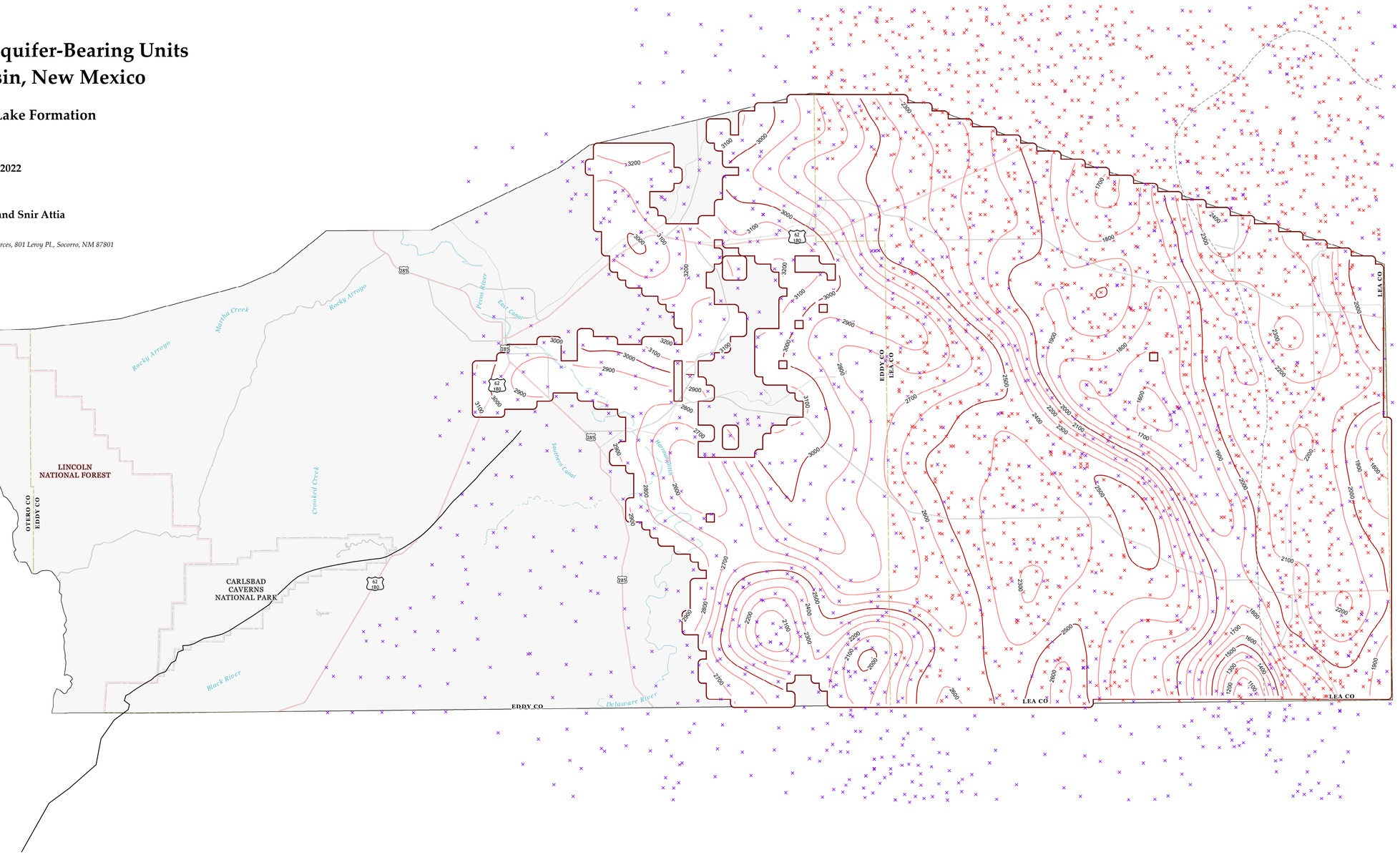
September 2022

by
Marissa M. Fichera and Snir Attia

New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801



UTM GRID AND 2022 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



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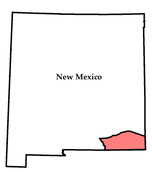

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North American Vertical Datum of 1988

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3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

Base of the Rustler Formation

September 2022

by
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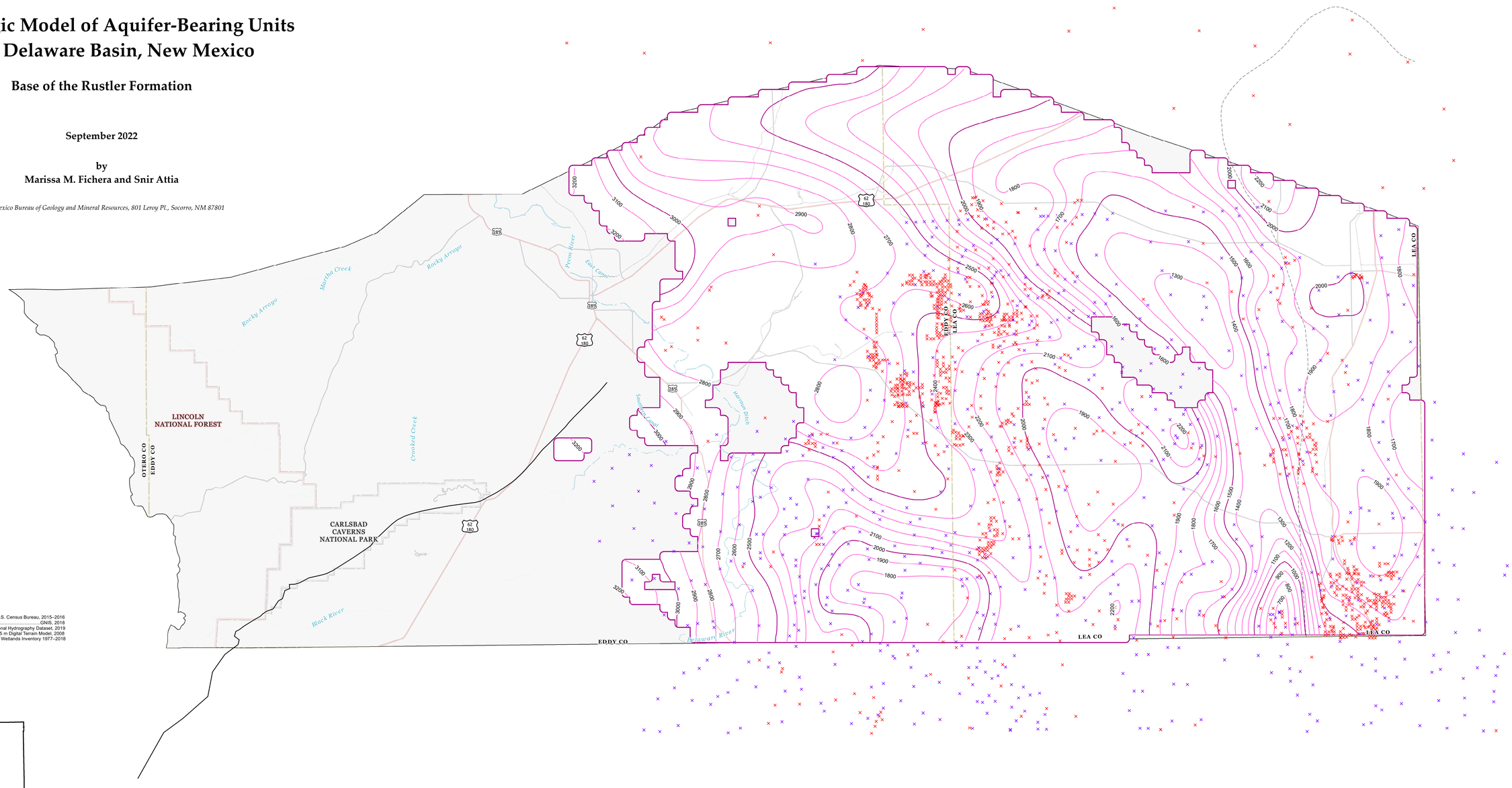
New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801



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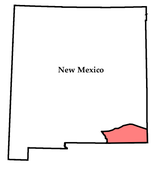

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1:250,000

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20000 0 20000 40000 60000 80000 100000 Feet

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Contour Interval 20 Feet

North American Vertical Datum of 1988

Explanation of Map Symbols

- Geophysical data collection locality
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- Outcrop point as structural control point (2nd surface)

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New Mexico Bureau of Geology and Mineral Resources
Open-File Geologic Map 303

Mapping of this quadrangle was funded by a matching-funds grant from the STATEMAP program of the National Cooperative Geologic Mapping Act (Fund Number: G21AC10770), administered by the U. S. Geological Survey, and by the New Mexico Bureau of Geology and Mineral Resources, (Dr. Nelia W. Dunbar, *Director and State Geologist*; Dr. J. Michael Timmons, *Assoc. Director for Mapping Programs*).

DRAFT

This draft 3D geologic model is preliminary and may undergo revision. It was produced using a wide variety of software and subsurface resources. It is being distributed in this draft form as part of the bureau's Open-File Geologic Map series (OF-GM), due to high demand for current geologic map data in these areas where STATEMAP quadrangles are located, and it is the bureau's policy to disseminate geologic data to the public as soon as possible.

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Comments to Map Users

This is a model of the regional shallow subsurface geologic framework of the Delaware Basin region of southeastern New Mexico. The model is intended to be a 'framework' model to be used for illustrative purposes, in large-scale (1:500,000 to 1:1,000,000) studies, or as a 'starting point' for finer resolution studies; it should not be used as a sole source of data for site-specific studies. Any enlargement of this map could cause misunderstanding in the detail of mapping and may result in erroneous interpretations. Site-specific conditions should be verified by detailed surface mapping or subsurface exploration.

This model was constructed by the NMBGMR Aquifer Mapping Program as part of the development of a hydrogeologic framework of the Delaware Basin region. Its construction involved compilation of a variety of input datasets including well data, surface geologic mapping, geologic cross-sections, and structure contours, evaluating the input data using geostatistical methods, then interpolating contact surfaces between control point locations. The model was constructed with a target horizontal resolution of no better than 1 km by 1 km, and a target vertical resolution of no better than 100 ft. The final, total uncertainty in each contact surface as a function of location was estimated by combining the uncertainties from the interpolation methods used and an n-fold cross-validation approach to evaluating dataset uncertainty. Model construction methods can be found in a methods report available from the New Mexico Bureau of Geology and Mineral Resources (https://geoinfo.nmt.edu/).

The data scheme of the geodatabase that contains this dataset is a preliminary adaptation for 3D geologic models of the NMBGMR implementation of the USGS GeMS data standard for geologic maps.

The map has not been reviewed according to New Mexico Bureau of Geology and Mineral Resources standards. Revision of the map is likely because of the on-going nature of work in the region. The contents of the report and map should not be considered final and complete until reviewed and published by the New Mexico Bureau of Mines and Mineral Resources. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the State of New Mexico, or the U.S. Government.

NMBGMR Open-File Geologic Map 303
Last Modified July 2022

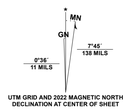
3D Geologic Model of Aquifer-Bearing Units of the Delaware Basin, New Mexico

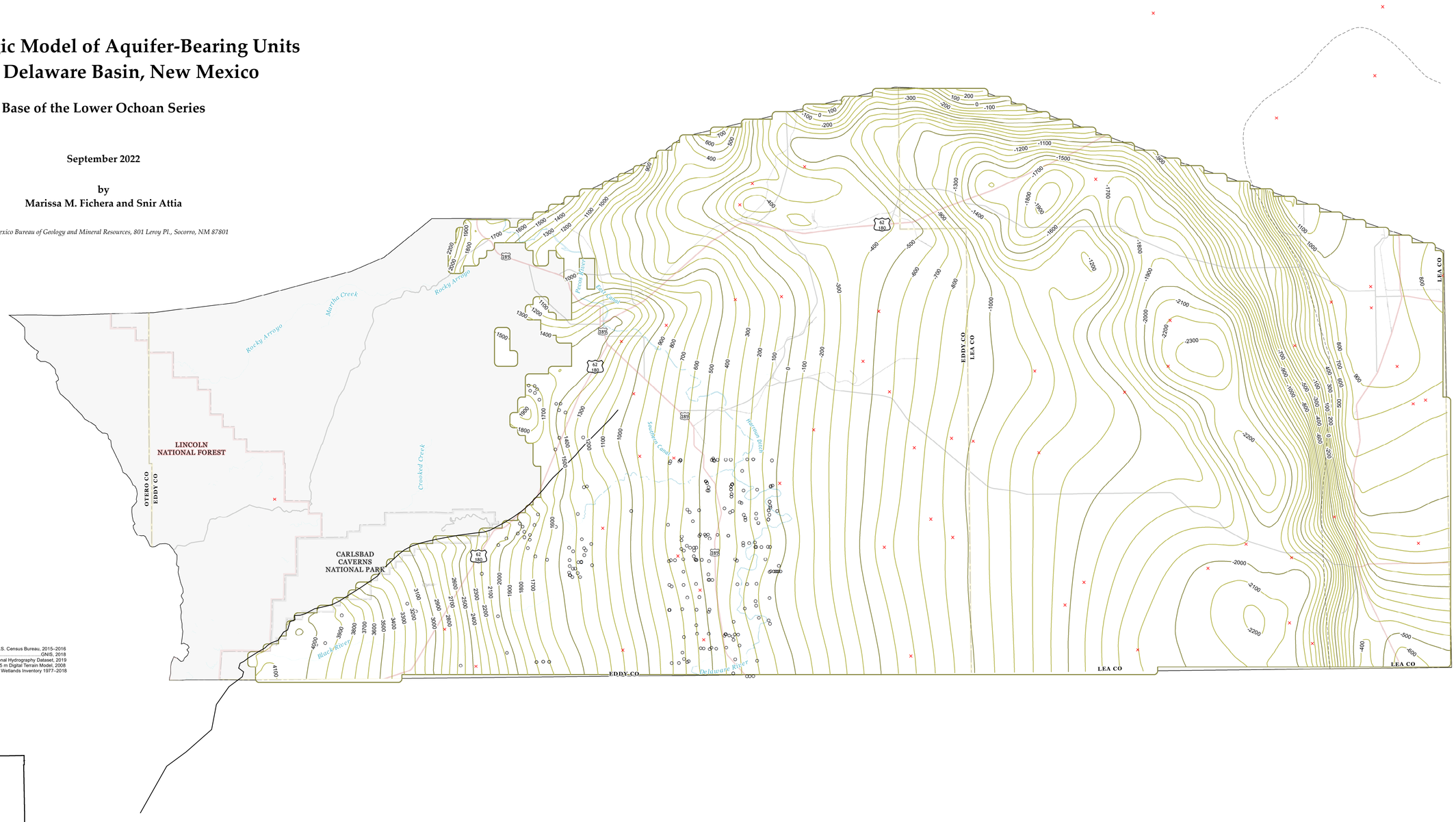
Base of the Lower Ochoan Series

September 2022

by
Marissa M. Fichera and Snir Attia

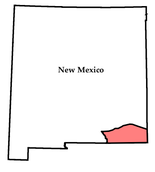
New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Pl., Socorro, NM 87801





Base map from U.S. Geological Survey 2021.
North American Datum of 1983 (NAD83)
Universal Transverse Mercator, Zone 13S

Roads..... U.S. Census Bureau, 2015–2016
Names..... GNIS, 2018
Hydrography..... National Hydrography Dataset, 2019
Contours..... IFSAR 4.5 m Digital Terrain Model, 2008
Wetlands..... FWS National Wetlands Inventory 1977–2018



Project Area Location

New Mexico Bureau of Geology and Mineral Resources
New Mexico Tech
801 Leroy Place
Socorro, New Mexico
87801-4796

[575] 835-5490

This and other STATEMAP quadrangles are available for free download in both PDF and ArcGIS formats at:

http://geoinfo.nmt.edu

Digital layout and cartography by the NMBGMR Map Production Group:
Phil L. Miller, Amy L. Dunn, Ann D. Knight, and A. R. Baca

1:250,000

5 2.5 0 5 10 15 20 25 Mile

20000 0 20000 40000 60000 80000 100000 Feet

5 2.5 0 5 10 15 20 25 Kilometer

Contour Interval 20 Feet

North American Vertical Datum of 1988

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Explanation of Map Symbols

- × Geophysical data collection locality
- ○ Drilling well or well location for hydrocarbon exploration

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