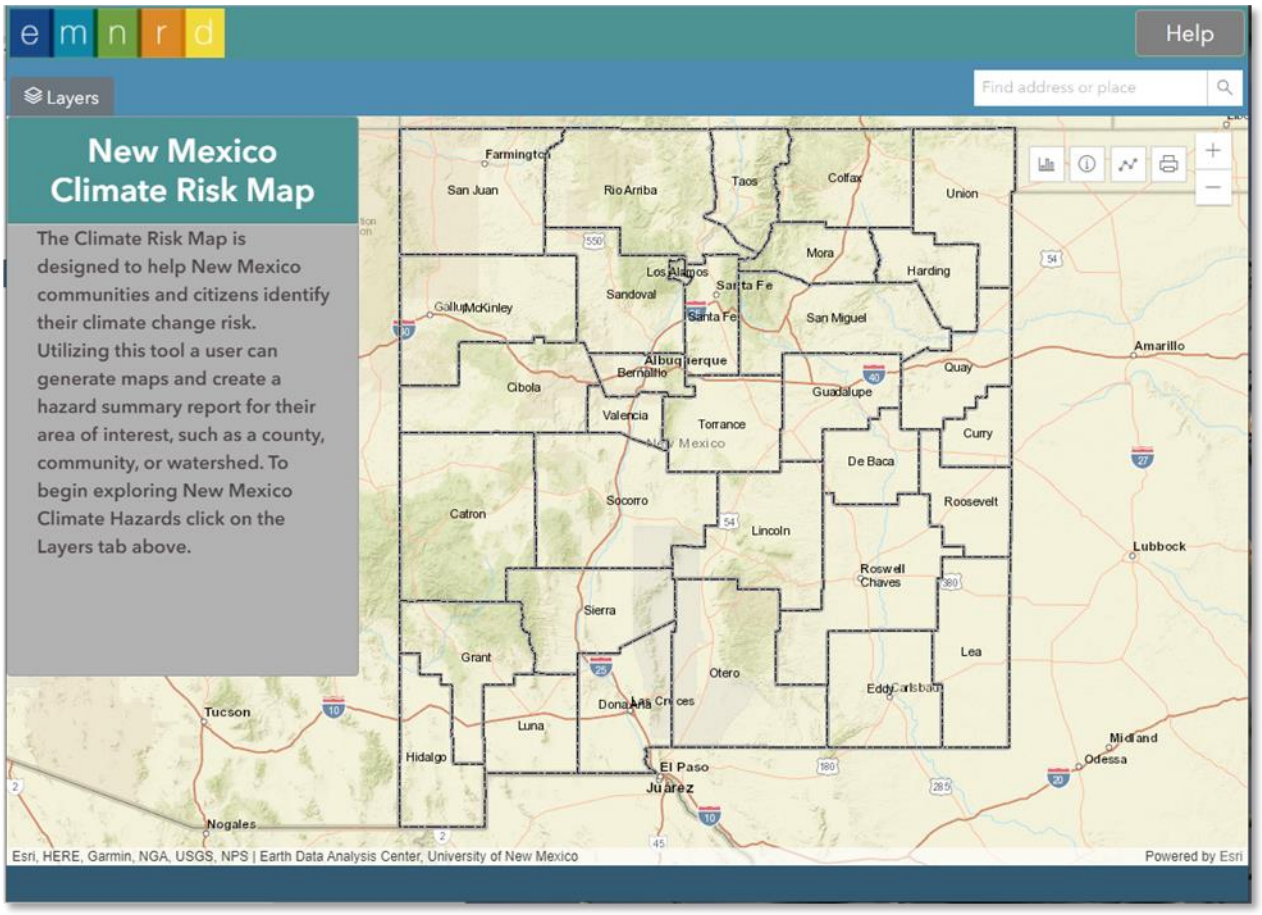
New Mexico Climate Risk Map User Guide



NEW MEXICO

emnrd

Energy, Minerals and Natural Resources Department

Contents

Introduction

Compatibility

- *The current version of the New Mexico Climate Risk Map is compatible with all browsers listed below; however, we recommend that users work with the application in Firefox or Chrome for optimal performance.* Microsoft Edge
- Mozilla Firefox
- Google Chrome
- Safari

Support

- The User Guide can be found on the Help page.
- For questions, email ClimateActionNM@state.nm.us

Overview

The Climate Risk Map is designed to help New Mexico communities and citizens identify the factors that contribute to their overall climate change risk. . Utilizing this tool, a user can generate maps and create a local data summary report for their area of interest, such as a county or community. Users can explore the map and generate a report for a selected area of interest.

While extensive, the data in the tool do not encompass all climate change-related factors and serve as a starting point for users to identify areas for further investigation, not a comprehensive assessment of climate risk. Communities, local, state, and tribal governments making policy and investment decisions should also conduct extensive local outreach to community members and review additional local, state, and regional resources. The Energy, Minerals, and Natural Resources Department (EMNRD) Energy Conservation and Management Division (ECMD) is available to provide technical assistance to users upon request based on staff availability.

ECMD chose to use three overarching data categories—hazard data, sensitivity factors, and adaptive capacity factors—based on the framework and definitions in the Asian Pacific Environmental Network's (APEN's) comprehensive "Mapping Resilience: A Blueprint for Thriving in the Face of Climate Disasters" report:

- *"**Environmental exposure**, which refers to the magnitude, frequency, and duration of an environmental exposure or disease risk;*
- ***Sensitivity,** which refers to the physiological and socioeconomic factors that directly or indirectly affect the degree to which a population is impacted by climate-related changes; and*

- ***Adaptive capacity,*** *which refers to the broad range of responses and adjustments to the impacts of climate change, including the capacity to moderate potential damages, take advantage of opportunities, and cope with consequences."*[1]

This tool refers to "environmental exposure" data as "hazard" data related to each of the five climate change related hazards covered.

ECMD has included demographic factors, including race and poverty, because historic disinvestment and disenfranchisement have led to a status quo where climate change is expected to disproportionately impact some communities. It is important to note that these communities are not inherently vulnerable because of their demographics, but often experience greater risk from climate change and other hazards because of a history of structural racism and environmental discrimination. The intent of this tool is to help the state, local, and tribal governments in NM prioritize investments that counteract this inequity. ECMD welcomes feedback from all communities through the "Feedback" button on the tool page, including on whether the data presented aligns with community knowledge.

Accessing New Mexico Climate Risk Map

To access the New Mexico Climate Risk Map web mapping application:

Open a compatible web browser while connected to the internet and navigate to the following web link:

https://nmclimatemap.org

[1] Asian Pacific Environmental Network. "Mapping Resilience: A Blueprint for Thriving in the Face of Climate Disasters." 2019. http://apen4ej.org/mapping-resilience/

Using the Viewer

The Viewer is designed to let users zoom to a place of interest, explore the map data, and quickly assess the climate risk. Upon accessing the application, the map opens as shown below.

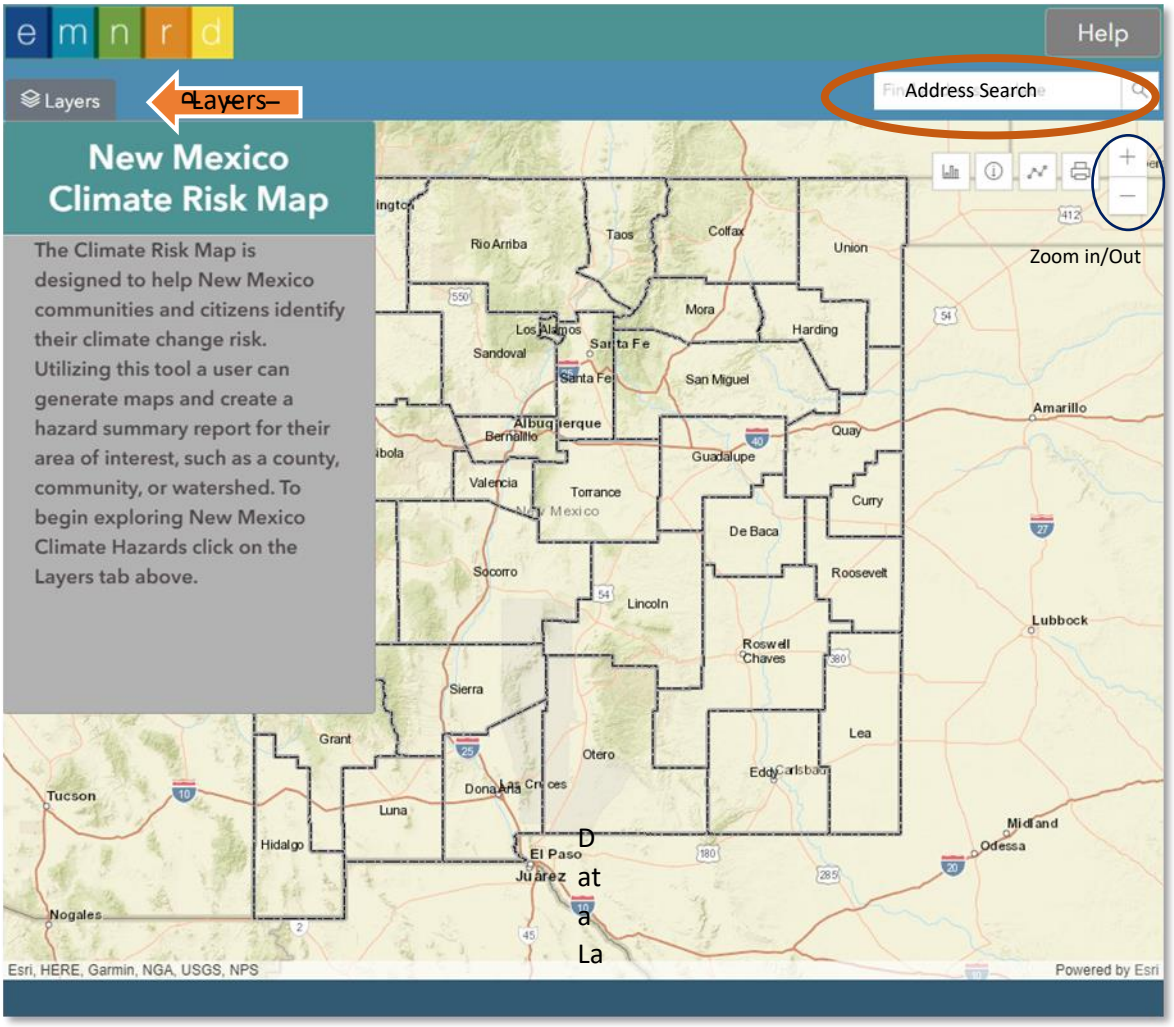


Figure 1. the New Mexico Climate Risk Map Application

Navigation

There are two ways to navigate the map:

1. Manually navigate using the zoom  in/out buttons.

2. Search for a specific location or place. Click in the box next to the magnifying glass and enter either an address, a town or an X and Y Coordinate. If an address or a location is entered a list of choices is presented, pick the correct address from the displayed list and the map will zoom to that location as shown below.

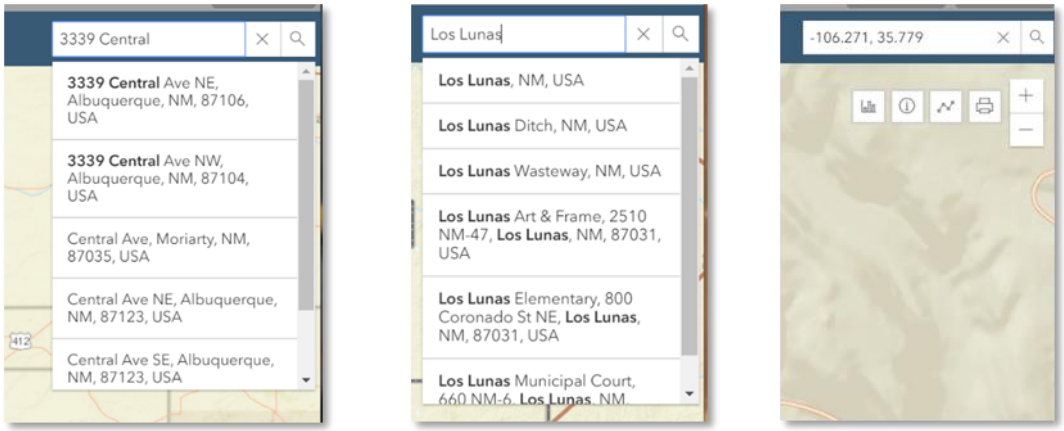


Figure 2. Search Methods

Climate Hazard Layers

The data layers in this mapping application are organized by Climate Hazard Type – Air Quality, Drought Flood, Heat and Wildfire. Each Climate Hazard has three subsets of information: Hazard Data, Sensitivity Factors, and Adaptive Capacity Factors. By clicking on the hazard of interest in the table of contents the layers expand and the 3 subsets are shown (Figure 3). Click the radio button on the left of the data to turn it on. Only one Climate Hazard layer may be turned on at a time, although the Reference Data layers may be turned on with a Climate Hazard layer.

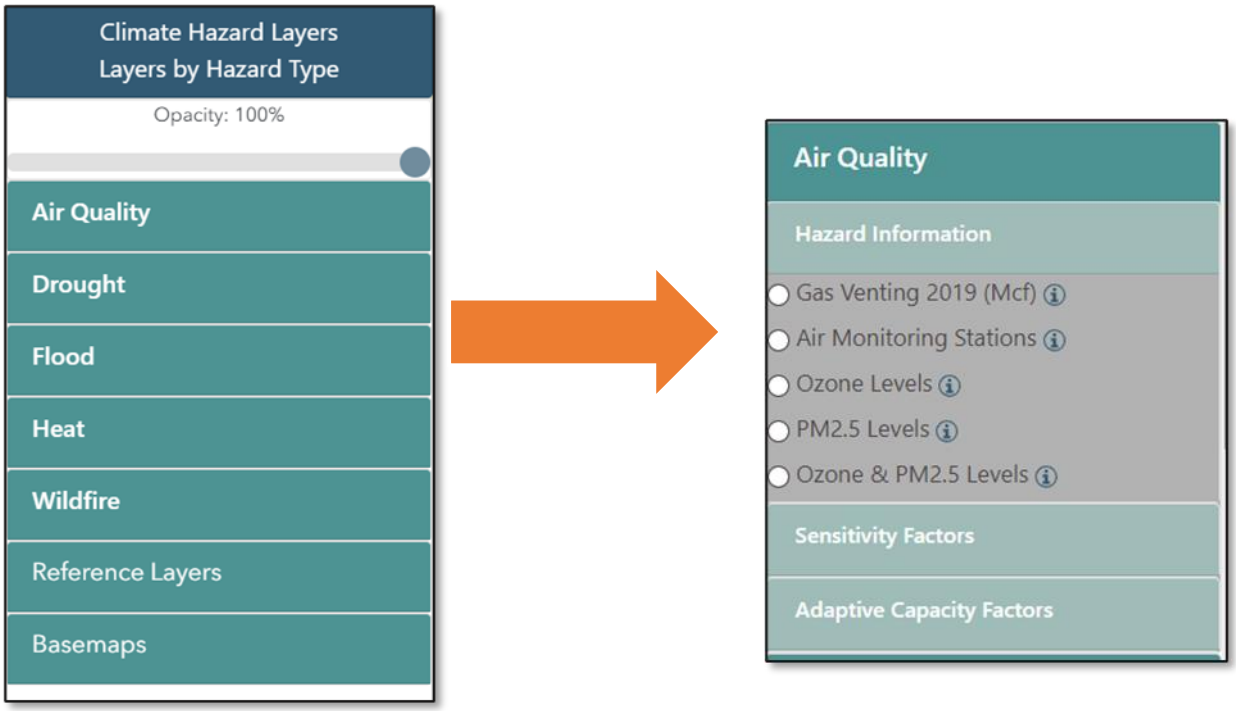


Figure 3. Hazard Layers in Table of Contents

The Climate Hazards layers have a legend along the bottom of the map window. As the user moves the cursor over the map the legend shows the corresponding value.

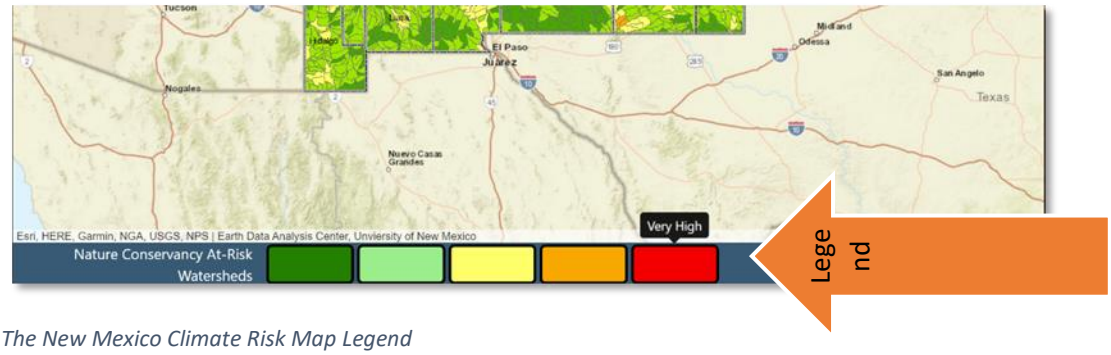


Figure 4. The New Mexico Climate Risk Map Legend

Data Display

Users can adjust the transparency of the data layers by using the Opacity slider at the top of the layer groups. Move the button to the left to increase the transparency of the data layers.

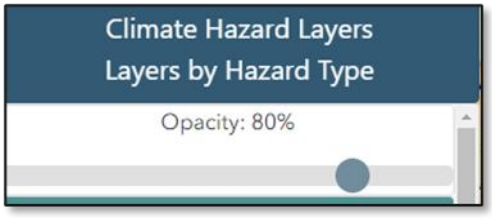


Figure 5. Opacity Control

View the description and explanation for the Climate Layers by hovering the cursor over the ⓘ to the right of the layer name.

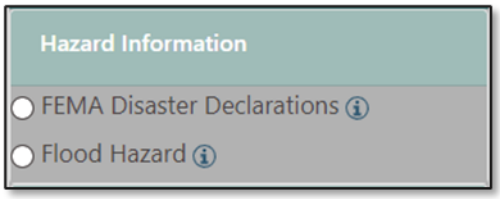


Figure 6. Data Information Button

Reference Layers

In addition to the Climate Hazard layers there are a series of Reference layers that include County boundaries, Tribal Land, Incorporated Places, Land Grant boundaries, and BLM Land Ownership. Theslider button to the left of the layer title turns these layers on and off. These layers stay on until turned off by the User.

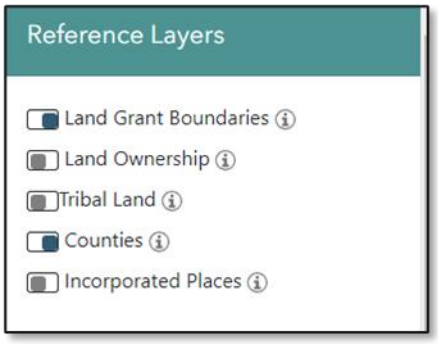


Figure 7. Reference Layers

Basemap

This feature allows the User to choose from a selection of basemaps. The default map is the streets basemap.

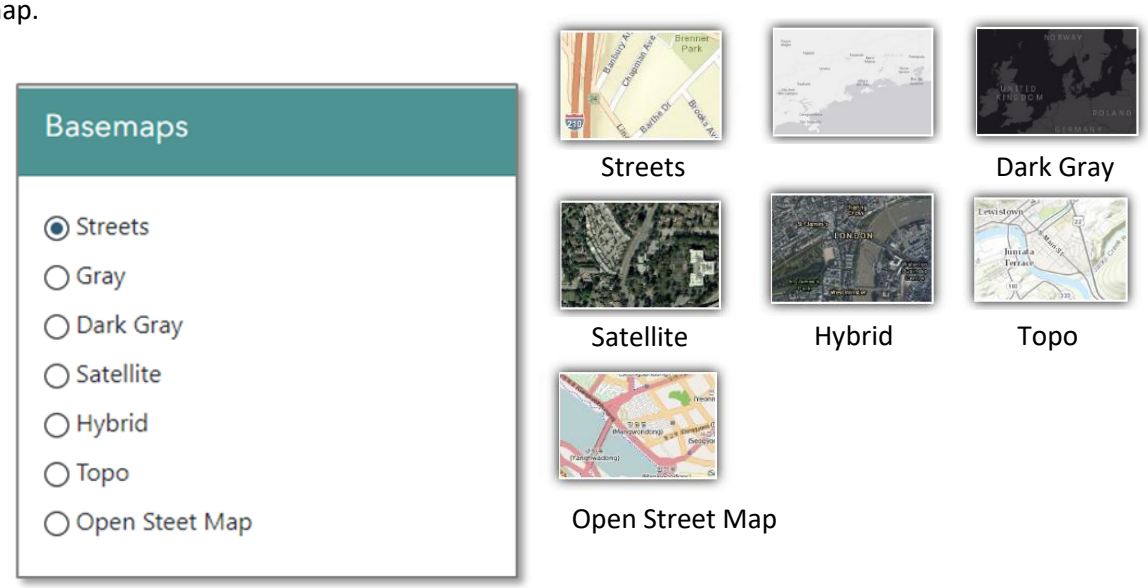


Figure 8. Basemaps

To select a Basemap, click the radio button next to the name.

- Streets: ESRI Street Basemap showing roads and highways, water features, political boundaries, and places.
- Gray: ESRI Light Gary Basemap, a neutral basemap with streets, political boundaries, water features.
- Dark Gray: ESRI Dark Gray Basemap, a darker neutral basemap with streets, political boundaries, water features.
- Satellite: ESRI Imagery Basemap, satellite and aerial magery at various scales and derived from various sources.

- Hybrid: ESRI Imagery Basemap satellite and aerial imagery at various scales and derived from varios sources with place names.
- Topo: ESRI Topographic Basemap, topographic Basemap showing generalized land surface features, strees, political areas and water features.
- Open Street Map: Open data streets, roads, highways, water features, political boundaries and places.

Map Tools

Info Tool 

The Info tool allows the User to click on a data layer and see informaton about that data feature. See Figure 9. To turn off the Info Tool, click the info Icon.

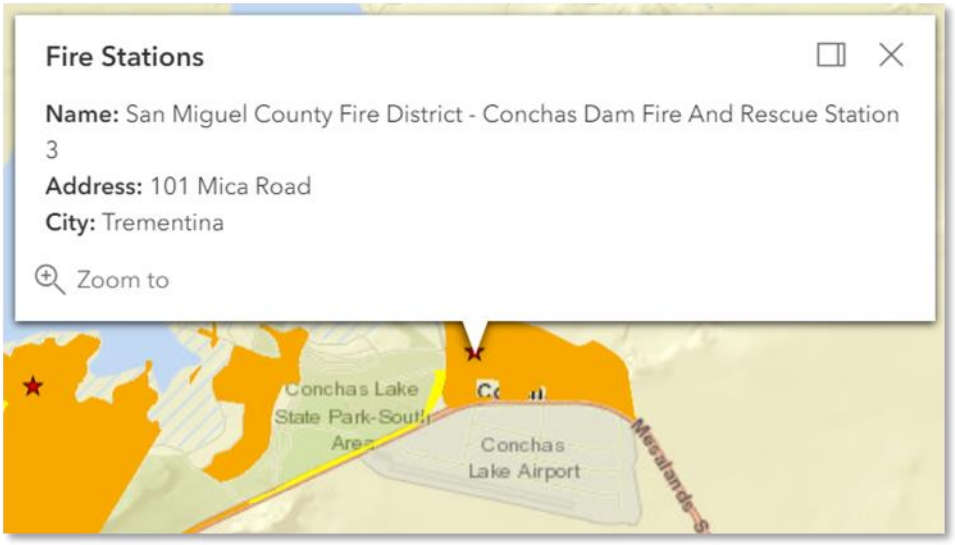


Figure 9. Info Tool Popup Window

Measure Tool 

The Measure tool measures distance in meters, feet, kilometers, miles, and yards.

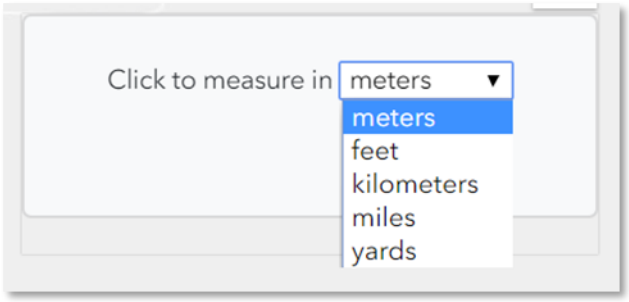


Figure 10. Measure Tool

To use the tool, click on the measure tool to activate and select the desired unit of measurement. Click on the map at the first location and then double click to end the measurement. The length appears in the measurement window.

Figure 11. Measure Tool Example

Once finished with the measurements click the measure tool icon to close the measuring dialog.

Print

The Print Button allows the user to create a PDF map of the current data layer and view including title, legend, and date. Click the print button to create a map of the current viewing extent. The User has the option to print the map to different file types and at various sizes. The default print setting is to print a PDF file at letter sized paper (ANSI A) in portrait orientation. The User can add a custom title to the map and if desired under Advanced Options and Author and copyright information can be added. Once the desired parameters are selected click the Export Button to create the pdf file, once the file is generated the name of the map appears at the bottom of the print window. Click on the file name to download the map to your computer. Once the pdf file is generated it can be emailed or printed. Alternatively, a map can be generated with only the data and no title, legend, or date. Click on the Map Only tab of the print window, type a name for the map, select file format, dimensions of the map, and click Export

Maps may also be generated in graphical formats such as JPG, GIF, or PNG as shown in the following figure.

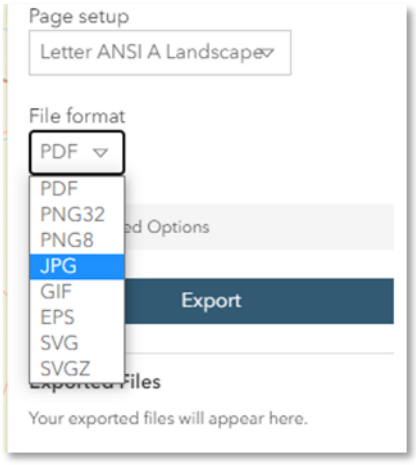


Figure 12 . Print Dialog Export File Types

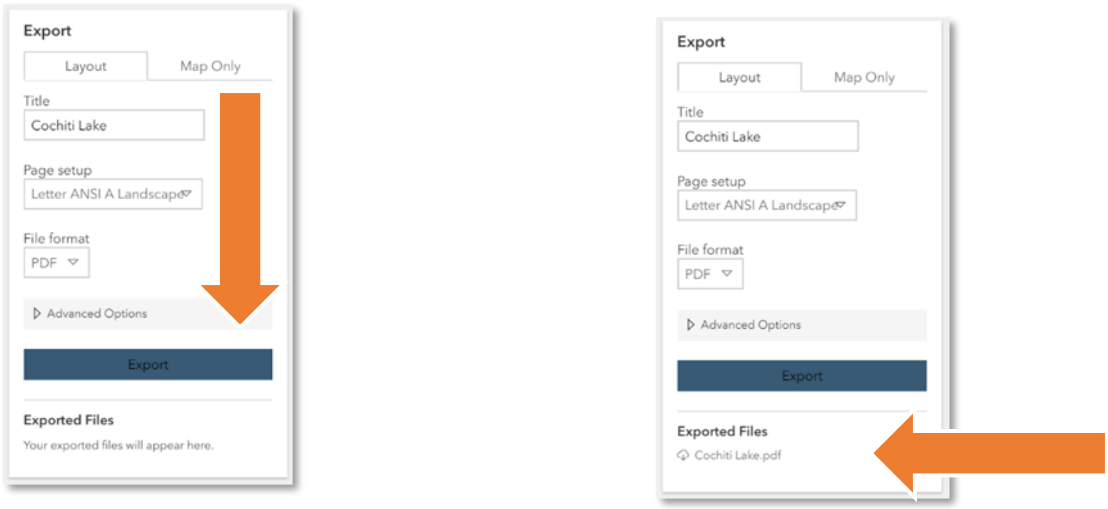


Figure 13 . Print Dialog and Export Pdf File

After saving the map, close the Print Dialog by clicking the Print Icon. 

If multiple maps are printed during a single session a list of those map is saved at the bottom of the print window and the files can be downloaded or printed a second time. These are only saved for the current session. If a user refreshes the web browser the list will reset.

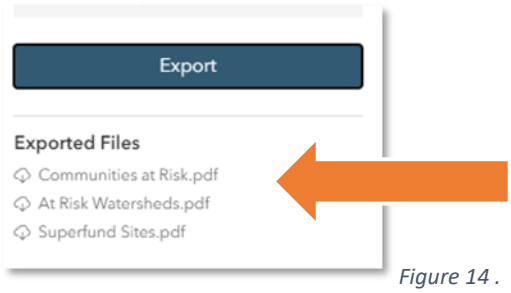


Figure 14 . Print History

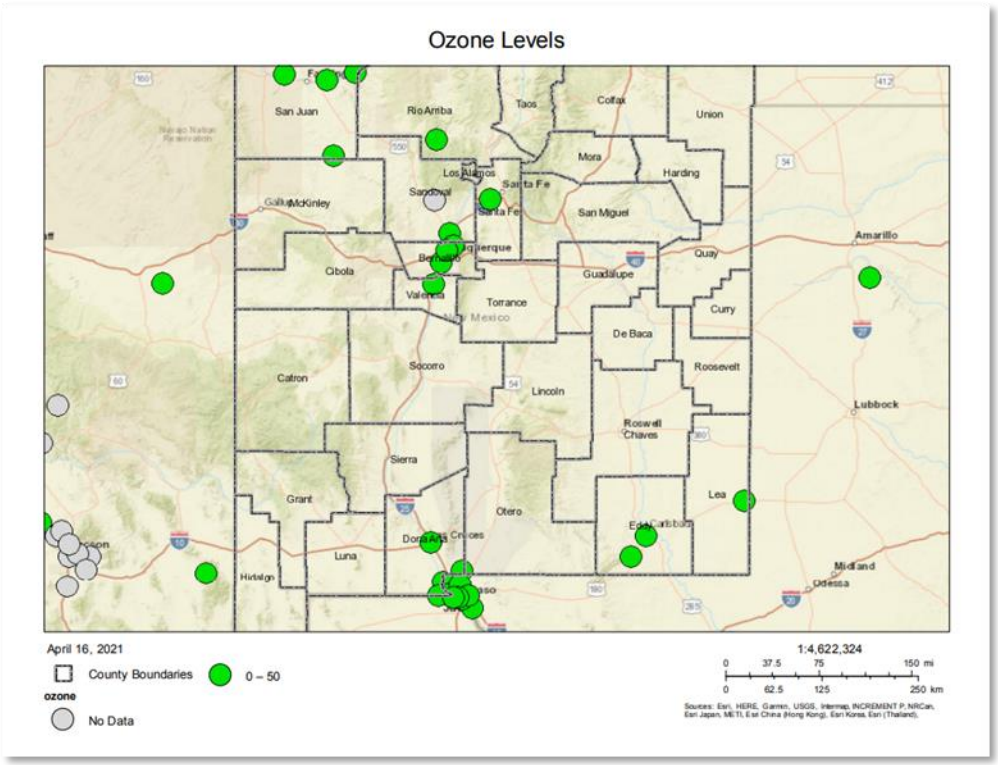


Figure 15 . Example of Printed Map

Generate Local Data Summary Report

The New Mexico Climate Risk Map will generate a downloadable report of a user's area of interest that summarizes the climate hazard, sensitivity and adaptive factors information.

A User can choose a County, Tribal, or City boundary for the report. To keep the report size manageable, users can only select a a single geography per report. Once the report is generated it can be downloaded as a PDF file.

Begin by zooming into the area of interest and then click on the reporting tool button as shown below.

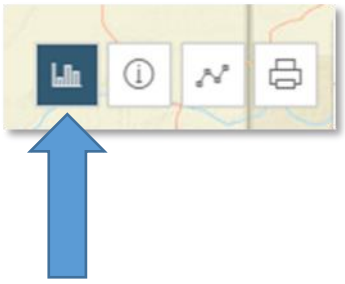


Figure 16 . Report Tool

The Tool properties box will pop up on the screen. Click the radio button next to “Choose” and then select the geography (County, City, or Tribal). Click on the down arrow to change geographic options. Once the geography is selected that layer will become active and appear on the map (Note: as directed above, the User must zoom into the area of interest before clicking on the reporting button.)

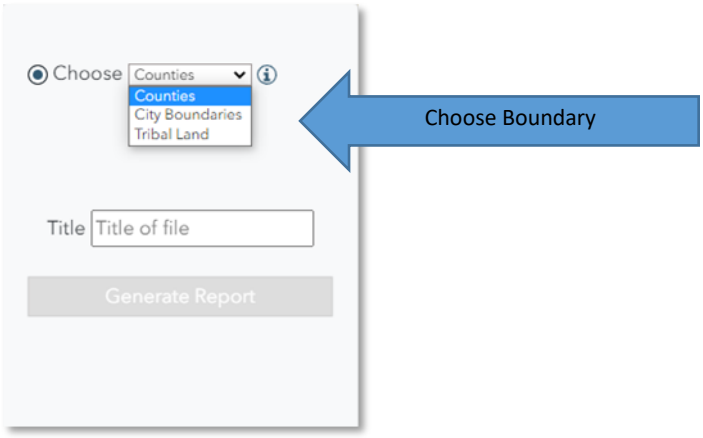


Figure 17. Report Generation Tool

Once the User has chosen their geography, for example Tribal Land, the  cursor will change

and the User will be able to click on the area of interest, once it is selected it will turn gray. Enter a title in the Title window and click Generate Report. The Report may take a few minutes to generate.

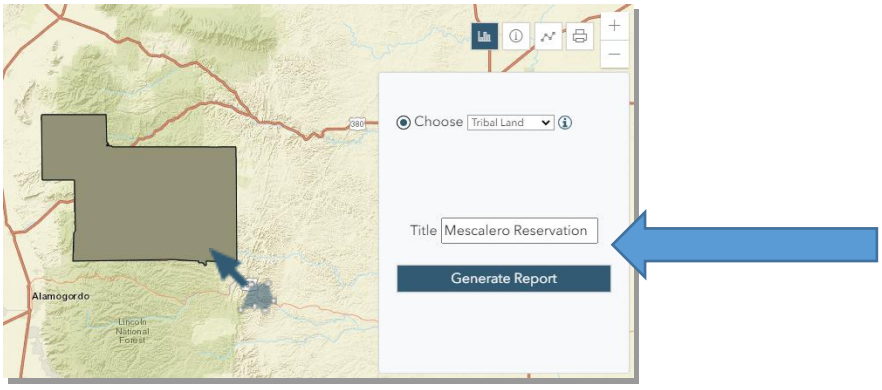


Figure 18. Report Geography Selection

Once the report is complete, the title will appear at the bottom of the Report window. The report is generated in a PDF format. Click on the name of the report, in this example Mescalero.pdf and the pdf document will open in the browser or PDF viewer.

If multiple reports are generated during a single session a list of those reports is saved at the bottom of the report window and the files can be downloaded or printed a second time. These are only saved for the current session, if a user refreshes the web browser the list will reset.

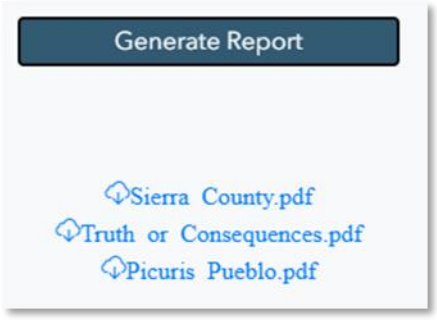


Figure 19. Multiple Reports Generated

REST Services

The GIS data utilized in this Map is available for use via ESRI ArcServer REST services. These services can be utilized with any GIS software. These services are available at the following locations:

- The New Mexico Climate Risk Map REST Service Directory: https://edacarc20.unm.edu/arcgis/rest/services/NMEMNRD
- The New Mexico Climate Risk Map REST Image Services Directory: https://edacarc20.unm.edu/arcgis/rest/services/NMEMNRD_Images

Primary Data Sources

1. Asian, Black, Hispanic, Native American, and White Ethnicity - Race; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B02001.
2. Poverty - Ratio of Income to Poverty Level in the Past 12 Months; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C17002.
3. Linguistic Isolation - Household Language by Household Limited English-Speaking Status; Universe: Population 16 years and over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C16002.
4. Population Children under 10 years of age Percentile - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table B01001 SEX BY AGE.
5. Population Elderly Over 65 years of Age Percentile - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table B01001 SEX BY AGE.
6. Elderly Household Living Alone Percentile - Households and Families; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: S1101.
7. Educational Attainment Percentile - Educational Attainment and Employment Status By Language Spoken at Home for The Population 25 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B16010.
8. Unemployment Percentile - Employment Status for The Population 16 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B23025.
9. Agricultural and Outdoor Workers Percentile - Industry by Occupation for the Civilian Employed Population 16 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C24050_001E; C24050 Agriculture, forestry, fishing and hunting, and mining; C24050_003E Construction.
10. Access to Vehicle Percentile - Tenure by Vehicles Available; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25044.
11. Access to Telephone Percentile - Tenure by Telephone Service Available by Age of Householder; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25043.
12. Energy Access Tenure by House Heating Fuel - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25117.
13. Housing Quality is a combination of factors including median age of homes, lack of complete plumbing facilities, and number of mobile homes (whether rented or owned). U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25016, B25035, B25033.
14. Rates of Asthma - NMIBIS - Asthma ED Visits, 2008-2018 - Age-adjusted Rates, Asthma

Emergency Department Visits Per 10,000 Population.

15. Rates of Cardiovascular Disease - NMIBIS -Myocardial Infarction (MI) ED Visits, 2008-2016 - Age-adjusted Rates, Acute Myocardial Infarction Emergency Department Visits Per 10,000 Population.
16. Diabetes Prevalence - NMIBIS -Diagnosed Diabetes Age-Adjusted Prevalence by County, New Mexico, 2015-2017.
17. Percentage with Disability - NMIBIS -New Mexico's Behavioral Risk Factor Surveillance System (BRFSS) Disability, Age-adjusted-2016, 2017, 2018.
18. Percentage in Food Insecure Households - NM_IBIS Food Insecurity Rate by Year, All Persons, New Mexico, and U.S. 2009-2017.
19. Percentage of Children in Food Insecure Households - NM_IBIS Food Insecurity Rate by County, Children Age 0 to 17 Years, New Mexico 2017
20. Obesity Prevalence - NMIBIS -New Mexico's Behavioral Risk Factor Surveillance System (BRFSS) Data - Overweight or Obese, Age-adjusted 2018, 2017, 2016.
21. Impaired Waters - These are assessed springs, streams, and lakes for the 2018 reporting cycle to the EPA under the Clean Water Act Section 305(b). Impaired waters were counted by Census tract and then percentiles created. Data was created by the New Mexico Environment Department, Surface Water Quality Bureau and found here: https://x-23.env.nm.gov/arcgis/rest/services/aqb/aqb_emissions/FeatureServer .
22. Air Monitoring Stations - New Mexico Environment Department Air Quality Bureau serves the stations at https://x-23.env.nm.gov/arcgis/rest/services/aqb/aqb_emissions/FeatureServer .
23. Ozone and PM 2.5 levels - EPA AirNow Air Quality Monitoring Data Air Now Data and served here https://services.arcgis.com/cJ9YHowT8TU7DUyn/arcgis/rest/services/Air_Now_Current_Monitors_Ozone/FeatureServer .
24. CDC 2018 Social Vulnerability Index (SVI) - Created by the Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) / Geospatial Research, Analysis, and Services Program (GRASP). It is served here https://services3.arcgis.com/ZvidGQkLaDJxRSJ2/arcgis/rest/services/CDC_Social_Vulnerability_Index_2018/FeatureServer .
25. Average Energy Burden (percent income) - Low Income Energy Affordability Data Tool, US Department of Energy, Office of Energy Efficiency & Renewable Energy https://lead.openei.org/assets/files/LEAD-Factsheet.pdf
26. Active & Inactive Oil and Gas Wells - The Oil Conservation Division (OCD), NMEMNRD maintains well locations throughout the State of New Mexico. Well data downloaded 11/30/2022 from ftp://164.64.106.6/Public/OCD/OCD GIS Data/Geodatabase/ . Wells summed by tract and Percentiles created.
27. Gas Venting - The Oil Conservation Division (OCD), NMEMNRD serves gas venting data at https://gis.emnrd.state.nm.us/arcgis/rest/services/OCDPUB/Venting_Flaring/MapServer/0 .
28. EPA Brownfields, New Mexico Environment Department, Ground Water Quality Bureau serves the data here: https://x-23.env.nm.gov/arcgis/rest/services/gwqb/brownfields/MapServer/0
29. Ground water Discharge Permits - New Mexico Environment Department issues ground water discharge permits. Data accessed 11/30/2020. The data is served here: https://x-23.env.nm.gov/arcgis/rest/services/gwqb/ground_water_discharge_permits/FeatureServer .
30. Waste Treatment Plants - New Mexico Environment Department, Surface Water Quality Bureau tracks the National Pollution Discharge Elimination System(NPDES) Permits which includes Waste Treatment Plants. The data is served here: https://x-

23.env.nm.gov/arcgis/rest/services/swqb/npdes_permits/MapServer .
31. Wetlands with wetlands action plans (WAPs) - the New Mexico Environment Department Surface Water Quality Bureau and served here: https://x-23.env.nm.gov/arcgis/rest/services/swqb/wap/MapServer.
32. Outstanding National Resource Waters USFS Wilderness Lakes and Wetlands - the New Mexico Environment Department, Surface Water Quality Bureau and served here: https://x-23.env.nm.gov/arcgis/rest/services/swqb/onrw/MapServer .
33. Hazardous Waste Facilities - New Mexico Environment Department Hazardous Waste Bureau https://x-23.env.nm.gov/arcgis/rest/services/hwb/hazardous_waste_facilities/MapServer/0
34. Leaking Petroleum Tank Sites, New Mexico Environment Department Petroleum Storage Tank Bureau data accessed 1/20/2020. https://x-23.env.nm.gov/arcgis/rest/services/pstb/leaking_petroleum_storage_tank_sites/MapServer/0 .
35. Petroleum Underground Storage Tanks Sites - New Mexico Environment Department Petroleum Storage Tank Bureau data accessed 11/20/2020. https://x-23.env.nm.gov/arcgis/rest/services/pstb/petroleum_storage_tank_facilities/MapServer/1 .
36. Petroleum Above Ground Storage Tanks Sites- New Mexico Environment Department Petroleum Storage Tank Bureau data accessed 11/20/2020. https://x-23.env.nm.gov/arcgis/rest/services/pstb/petroleum_storage_tank_facilities/MapServer/0 .
37. Superfund Sites - U.S. Environmental Protection Agency, data served by the New Mexico Environment Department. https://x-23.env.nm.gov/arcgis/rest/services/epa/superfund_sites/MapServer/0 .
38. The wildfire hazard potential (WHP) data are from Wildfire risk data is from the USDA Forest Service, Fire Modeling Institute (FMI), Missoula Fire Sciences Laboratory.
Dillon, Gregory K. 2018. Wildfire Hazard Potential (WHP) for the conterminous United States (270-m GRID), version 2018 classified. 2nd Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2015-0046-2 .
39. Communities at Risk from Wildfire - New Mexico State Forestry, Energy, Minerals and Natural Resources Department Forestry Division. New Mexico Communities at Risk Assessment Plan. https://gis.emnrd.state.nm.us/public/rest/services/SFDPUB/Fire_Management/MapServer/3 .
40. NM State Fire History - fire locations developed and maintained by the New Mexico Energy, Minerals, and Natural Resources, State Forest, data served here: https://gis.emnrd.state.nm.us/public/rest/services/SFDPUB/New_Mexico_Wildfire_History/MapServer/22 .
41. At-Risk Watersheds - most at-risk watersheds as identified by the *Nature Conservancy Rio Grande Water Fund Comprehensive Plan for Wildfire and Water Source Protection*. 2014.
42. Large Historical Wildfire Perimeters, large wildfires on federal lands, data from National Interagency Fire Center.
43. Wildland Urban Interface (WUI) data - http://silvis.forest.wisc.edu/data/wui-change/
Radeloff, Volker C.; Helmers, David P.; Kramer, H. Anu; Mockrin, Miranda H.; Alexandre, Patricia M.; Bar Massada, Avi; Butsic, Van; Hawbaker, Todd J.; Martinuzzi, Sebastián; Syphard, Alexandra D.; Stewart, Susan I. 2017. The 1990-2010 wildland-urban interface of the conterminous United States - geospatial data. 2nd Edition. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2015-0012-2 .
44. Surface Drinking Water Importance Index and Index of Forest Importance to Surface Drinking Water. The USDA Forest Service Forests to Faucets project uses GIS to model and map the continental United States land areas most important to surface drinking water, the role forests

play in protecting these areas, and the extent to which these forests are threatened by development, insects and disease, and wildland fire. https://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml

45. Vegetation Treatments geodatabase - NMFWRI, New Mexico Highlands University, Forest and Watershed Health Coordinating Group. https://www.arcgis.com/home/item.html?id=a6ffb74828b541c0bbc883543fb774bb
46. Tree Canopy, Impervious Surface and descriptions, and Land Cover Change 2001-2016 is derived from the National Land Cover Data (NLCD) from the Multi-Resolution Land Cover Consortium (MRLC) program showing their latest data (2016) for land cover classes. https://www.mrlc.gov/national-land-cover-database-nlcd-2016 .
47. Drought Monitor - U.S. Drought Monitor which is produced through a partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. https://droughtmonitor.unl.edu/ .
48. 30-year precipitation average (1981-2010) and 30-year temperature maximum, mean and minimum are from the PRISM Climate Group at Oregon State University. https://prism.oregonstate.edu/ .
49. The NCICS Climate Change Models are downscaled data for Average projected temperature change (2021-2050, 2051-2070, 2070-2099) and percent change in The precipitation change data are in percent change for each season from 1970-1999 averages to 2071-2099 based on multi-model means (Derived from Figure 2-14). (December-February, March-May, June-August, and September -November 2070-2099) are from Third Annual Climate Assessment https://nca2014.globalchange.gov/report found at the NOAA's North Carolina Institute for Climate Studies. This dataset was created from data for United States and resampled for New Mexico. The original data are in 5x5 degree blocks and the temperature change shows the average projections of change in temperatures for the listed dates from the 1970-1999 means in degrees C (Derived from Figure 22-1). The precipitation change data are in percent change for each season from 1970-1999 averages to 2071-2099 based on multi-model means (Derived from Figure 2-14).
50. FEMA Disaster Declarations - FEMA and served here: https://gis.fema.gov/arcgis/rest/services/FEMA/HistoricalDesignations/MapServer/0 .
51. Flood Hazard is the FEMA Special Flood Hazard Areas (SFHA) for New Mexico, data downloaded from FEMA Map Service Center 3/12/2021.
52. FEMA Flood Insurance – FEMA, data downloaded 8/14/2020 https://nfipservices.floodsmart.gov//reports-flood-insurance-data .
53. Rio Metro transit and Albuquerque transit access data - the Mid-Region Council of Governments, 10/5/2020.
54. Medical Facilities - Community Anchor Site Assessment (CASA) database for New Mexico Broadband (NMBB) Program. Accessed 12/16/2020.
55. Land Grant Boundaries - Resource Geographic Information System (RGIS), http://rgis.unm.edu/rgis6/dataset.html?uuid=bd489bb4-7d12-4f66-975a-217ae24cc952 accessed 10/12/2020.
56. Tribal Land - Resource Geographic Information System (RGIS), http://rgis.unm.edu/rgis6/dataset.html?uuid=b63a52b7-5d14-4f4d-89b4-13cf96609d4f accessed 10/12/2020.
57. Incorporated Places - Resource Geographic Information System (RGIS),

http://rgis.unm.edu/rgis6/dataset.html?uuid=cef43f59-c80f-416e-ab04-a8cdeb192792 accessed 11/15/2020.
58. County Boundaries - Resource Geographic Information System (RGIS), http://rgis.unm.edu/rgis6/dataset.html?uuid=e4924a30-8f40-44ad-87d0-87053a1086ab, accessed 8/20/2020.

Data Processing

Census Data

The Census tables were downloaded from the U.S. Census American Community Survey website and percentiles were calculated. The tabular data was then joined with the Census Tract level GIS data to create percentiles for each of the following Census datasets.

59. Asian, Black, Hispanic, Native American, and White Ethnicity - Race; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B02001.
60. Poverty - Ratio of Income to Poverty Level in the Past 12 Months; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C17002.
61. Linguistic Isolation - Household Language by Household Limited English-Speaking Status; Universe: Population 16 years and over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C16002.
62. Population Children under 10 years of age Percentile - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table B01001 SEX BY AGE.
63. Population Elderly Over 65 years of Age Percentile - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table B01001 SEX BY AGE.
64. Elderly Household Living Alone Percentile - Households and Families; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: S1101.
65. Educational Attainment Percentile - Educational Attainment and Employment Status By Language Spoken at Home for The Population 25 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B16010.
66. Unemployment Percentile - Employment Status for The Population 16 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B23025.
67. Agricultural and Outdoor Workers Percentile - Industry by Occupation for the Civilian Employed Population 16 Years and Over; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: C24050_001E; C24050 Agriculture, forestry, fishing and hunting, and mining; C24050_003E Construction.
68. Access to Vehicle Percentile - Tenure by Vehicles Available; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25044.
69. Access to Telephone Percentile - Tenure by Telephone Service Available by Age of Householder; U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25043.
70. Energy Access Tenure by House Heating Fuel - U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25117.
71. Housing Quality is a combination of factors including median age of homes, lack of complete plumbing facilities, and number of mobile homes (whether rented or owned). U.S. Census Bureau, 2018 American Community Survey 5-Year Estimates; Table ID: B25016, B25035, B25033.

Health Data

The following health datasets were downloaded from the NM-IBIS website (https://ibis.health.state.nm.us/) as tabular data. The downloaded tables were joined to county level GIS data for inclusion in the application.

1. Diabetes Prevalence – NM-IBIS, Diagnosed Diabetes Age-Adjusted Prevalence by County, New Mexico, 2015-2017.
2. Percentage with Disability – NM-IBIS, New Mexico's Behavioral Risk Factor Surveillance System (BRFSS) Disability, Age-adjusted-2016, 2017, 2018.
3. Percentage in Food Insecure Households – NM-IBIS Food Insecurity Rate by Year, All Persons, New Mexico, and U.S. 2009-2017.
4. Percentage of Children in Food Insecure Households – NM-IBIS Food Insecurity Rate by County, Children Age 0 to 17 Years, New Mexico 2017
5. Obesity Prevalence – NM-IBIS, New Mexico's Behavioral Risk Factor Surveillance System (BRFSS) Data - Overweight or Obese, Age-adjusted 2018, 2017, 2016.
6. Rates of Asthma - NMIBIS - Asthma ED Visits, 2008-2018 - Age-adjusted Rates, Asthma Emergency Department Visits Per 10,000 Population.
7. Rates of Cardiovascular Disease - NMIBIS -Myocardial Infarction (MI) ED Visits, 2008-2016 - Age-adjusted Rates, Acute Myocardial Infarction Emergency Department Visits Per 10,000 Population.

Industrial Data

Percentile rankings were created for large point location datasets to standardize the data for comparison to other datasets in percentile format. These datasets include leaking petroleum storage tanks, above ground storage tanks, underground storage tanks oil and gas wells.

NMED Petroleum Above Ground and Underground Storage Tanks

The storage tank data has the location and number of tanks for each entity. Each location was assigned a weight based on the number of locations indicated in the dataset. The locations were weighted from 1-5, with 5 being highest based on Natural Breaks in the data distribution as show in the table below.

Table 1. Natural Breaks in underground storage tank data distribution

Number of Underground Storage Tanks	Rank
10-47	5
9-5	4
4-3	3
2	2
1	1

Next distance to nearest populated census block was calculated using GIS. The site weights were then adjusted by multiplying the weight by 1 for sites less than 250m, 0.5 for sites 250-500m, 0.25 for sites 500-750m, and 0.1 for sites 750-1000m from the nearest populated census blocks within a given tract. Sites outside of a census tract, but less than 1000m from one of that tract's populated blocks were similarly adjusted based on the distance to the nearest block from that tract (See image below).

Table 2. Distances and Weights

Distance (meters)	Weight
250	1
500	0.5
750	0.25
1000	0.1

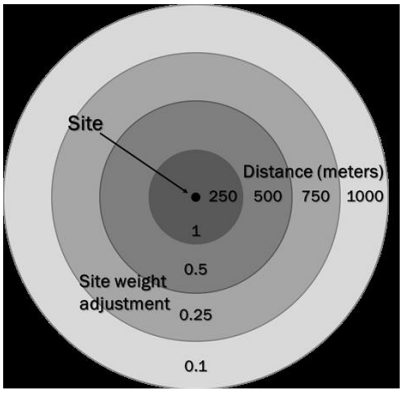


Figure 20. Weight Distances

The data was then aggregated to Census Tract and percentiles were created.

NMED Leaking Petroleum Tank Sites

NMED has created a Priority score for leaking storage tanks this score was utilized along with the weighting by distance to populated census block to create the in the creation of the percentile ranking. The distance weighting was the same as described above. Tanks that had a Current Priority score of zero were given a ranking of 0.5 otherwise they would be excluded from the percentile ranking. Three were 1,449 tanks with a priority score of zero and of those 1,391 were in populated blocks. The data was then aggregated to Census Tract and percentiles created.

NMED Ground water Discharge Permits

Ground water Discharge Permits address a wide variety of discharges including domestic wastewater facilities, large capacity septic tank leach fields, reclaimed wastewater reuse, power generating plants, commercial laundries (when not served by sanitary sewers), commercial land farms for treatment of contaminated soil, industrial discharges, and ground water remediation systems. The data was not weighted by distance to populated census block since all permit locations are within a populated census block. Permits were summed by tract and percentiles were created.

NMED Impaired Waters

The Impaired Waters are assessed springs, streams, and lakes for the 2018 reporting cycle to the EPA under the Clean Water Act Section 305(b) are from New Mexico Environment Department, Surface Water Quality Bureau. The number of current impairments for each water body was summed. The data was not weighted by distance to populated census block since all impaired water bodies are located within a populated census block. The data was aggregated to census tract and percentiles were created.

NMEMNRD Active and Inactive Oil and Gas Wells

Well locations represent a single well. The distance to nearest populated census block was calculated using GIS. Next, each site was weighted. The weights were calculated based on distance to a populated

census block. Sites less than 250m from a populated block were given a weight of 1, sites 250-500m from a populated block 0.5 for, a weight of 0.25 for sites 500-750m away, and a weight of 0.1 for sites 750-1000m. Sites over a 1,000m from a populated block were not weighted. The weights were summed by Census tract and percentiles created.

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