

NEW MEXICO ELEVATION DATA PLANNING AND ACQUISITION

New Mexico Statewide Lidar Acquisition Plan

NM GAC and NM Elevation Data Planning/Acquisition Subcommittee

NM Geospatial Advisory Committee: Mission

- Coordinate geospatial technology in state government
- Develop policy recommendations and guidelines in state and local government
- Share geospatial technology among all government agencies and the public

NM GAC, NM RGIS, and NMGIC: The state's 3 core geospatial elements

Subcommittee: Reasons and Roles

- Formed January 2014 in response to NM needs for enhanced elevation data
- Develop partner/stakeholder relationships to identify lidar needs and priorities
- Develop the geospatial/map-based NM Statewide Lidar Acquisition Plan

NM Elevation Needs

Increasingly, New Mexico's key geospatial data needs must be met with high-quality, high-resolution, and current elevation data. Enhanced elevation data are essential to a broad and cross-cutting range of applications, analyses and evaluations, and established programs. These include emergency preparedness, resource management, natural hazard response and mitigation, homeland security, and many others.

The state's more than 10,000 feet in relief and rich diversity of landforms, geologies, ecosystems, climates, populations, and cultures alter our surface and features through large wildfires, ensuing floods, subsidence (from extractive industries, among other causes), erosion, sedimentation, irrigation, drought, seismic activity, and more. Our concerns and issues will benefit from, and some be mitigated with, better elevation mapping. Statewide lidar data will result in better elevation mapping.

To address our lidar data needs, the NM Elevation Data Planning and Acquisition Subcommittee is responding to the national 3DEP initiative (see sidebar) with a plan for the statewide acquisition of high-quality lidar data.

What is lidar?

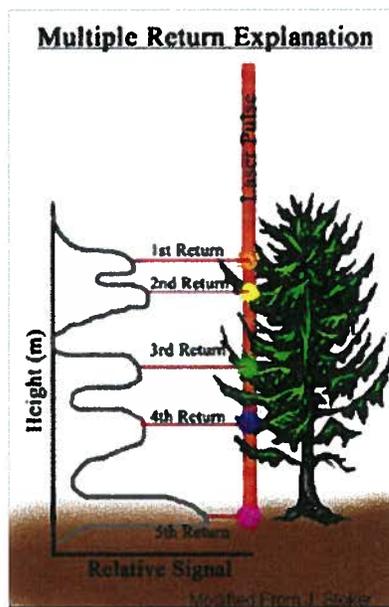
lidar: light detection and ranging

Lidar measures distances to the Earth using laser pulses from aircraft.

Processed pulses give precise 3D information about surface shape and features.

Result: A dense, detail-rich cloud of elevation points—a lidar point cloud.

Point clouds yield many geospatial products: Bare Earth DEMs, Digital Surface Models (e.g., canopy, building and urban canyon), Contours, Elevation Profiles



National 3D Elevation Program

The 3D Elevation Program (3DEP) initiative responds to a growing need for high-quality topographic data and other three-dimensional representations of natural and constructed features. 3DEP's primary goal is the systematic collection over 8 years of lidar data for the 50 states (ifsar data for Alaska) and US territories. Based on National Enhanced Elevation Assessment (NEEA) results, the initiative documents more than 600 needs across federal agencies, states, and local, tribal, and industry sectors. The 3DEP initiative is recommended by the National Digital Elevation Program and endorsed by the National States Geographic Information Council and National Geospatial Advisory Committee.

The National Map: nationalmap.gov/3DEP/

NM Subcommittee Members

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Caeri Thomas

Santa Fe County

Erle Wright

UNM Earth Data Analysis Center and

NM Geospatial Data Clearinghouse

Paul Neville

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New Mexico's Elevation Data

What we have: Existing Elevation Data Sets

Out of Date: Most > 40 yrs old Data range from 15 yrs old to > 70 yrs old
Spatial Resolution: 30 m, 10 m (10-m data are products of 30-m autocorrelation)
Vertical RMSEz: 1–2 m to 11–40 m to Unknown

What we need: Quality Level 2 (QL2) Lidar Data Sets

3DEP Acquisition Dates: 2015–2022
Spatial Resolution: 1 m (nominal pulse spacing: 0.7 m)
Vertical RMSEz: 10 cm (3.94 in)

View interactive image comparisons at <https://edac.unm.edu/projects/lacueva/>.

NM Lidar Needs and Priorities

Lidar elevation data will address or improve on many concerns and issues crucial to New Mexico, including:

Natural hazard response and mitigation, especially for wildfire (in the last decade we have seen several fires with burn area greater than 100 sq mi).

Flood risks.

Emergency preparedness.

Forest resources management.

Energy development (in the US, New Mexico ranks 6th in oil and gas production, 11th in wind potential, and 3rd in solar potential).

Agricultural needs (irrigated, dryland, grazing).

Water resources protection and delivery (including interstate and international water compacts).

Transportation and utility corridors (with major cross-continental power lines and gas pipelines).

Endangered, native, and game species habitat management.

Urban growth and the wildland-urban interface.

Extensive tribal lands.

Security concerns—military installations (including the largest and part of the second-largest installations in the US), two national laboratories, a nuclear-waste repository, and a 200-mile border with Mexico.

Subcommittee Proposal for Statewide Lidar

Responding to the nationwide 3DEP opportunity, New Mexico proposed leveraging USGS and multi-agency federal dollars in the acquisition, processing, and delivery of statewide, high-resolution (QL2) lidar data over a five-year period. Final data products will be delivered and made publicly available, at no cost, on NM RGIS, the state digital geospatial data clearinghouse.

Statewide QL2 Lidar Acquisition

Provides baseline high-quality elevation data

Leverages economies of scale—efficient, cost effective

Positions decision makers and analysts to identify, evaluate, mitigate, and respond to natural and human-caused changes in New Mexico

Users: state, local government, federal, tribal, nonprofit, industry, business, private, the public

This collaborative program will result in the best available data for the greatest number of users.

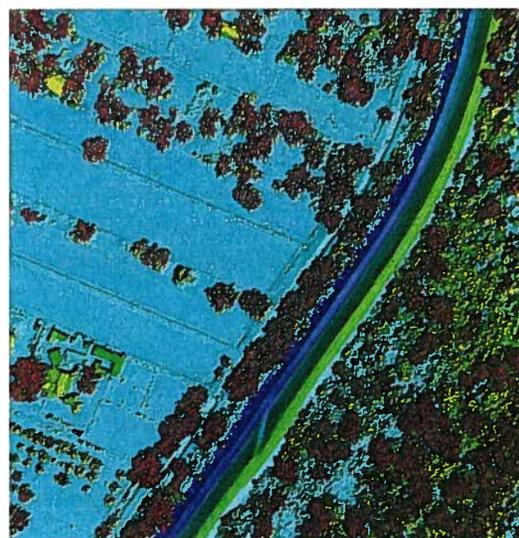
Hillshade: La Cueva and Surroundings



What we have statewide 10-m DEM (NED)



What we need statewide Lidar Last Return



Corrales (QL2 Lidar)

Classified by Elevation

New Mexico Partners by Land Status

FEDERAL	33.8%
TRIBAL	10.5%
STATE	11.8%
PRIVATE	43.9%