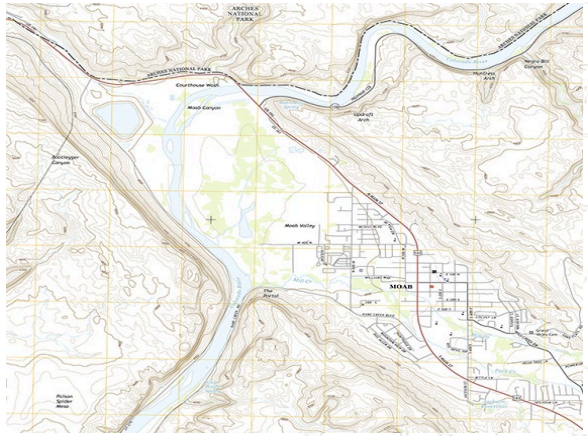
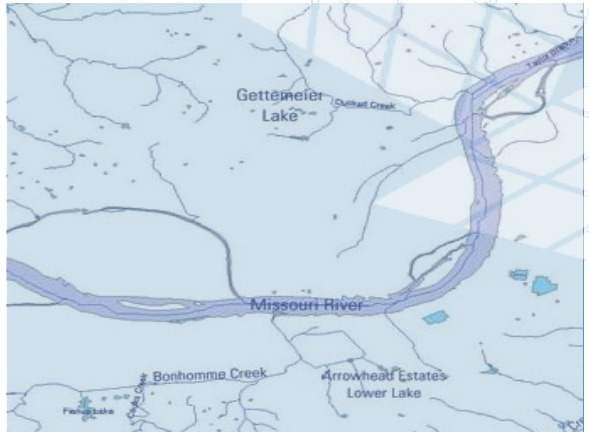
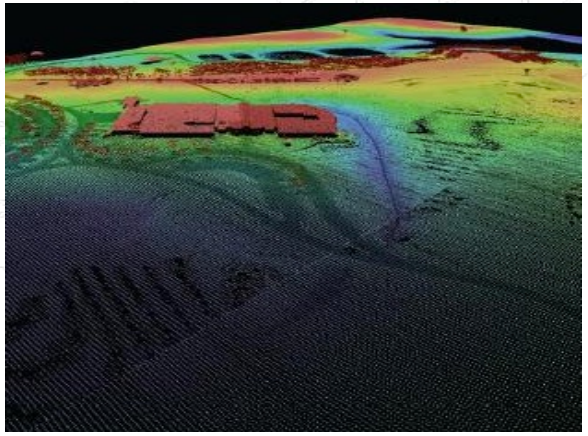
USGS highlights







USGS science for a changing world

The National Map
Your Source for Topographic Information

April 9, 2024

Agenda

- Logistics
- Introduction of USGS staff
- Brief background of USGS and partner roles
- Status of lidar in Nevada
- Data Access and Services
- USGS Tools lidar visualization
- Future of 3DEP and 3DHP
- topoBuilder Application, if time allows

USGS Introductions

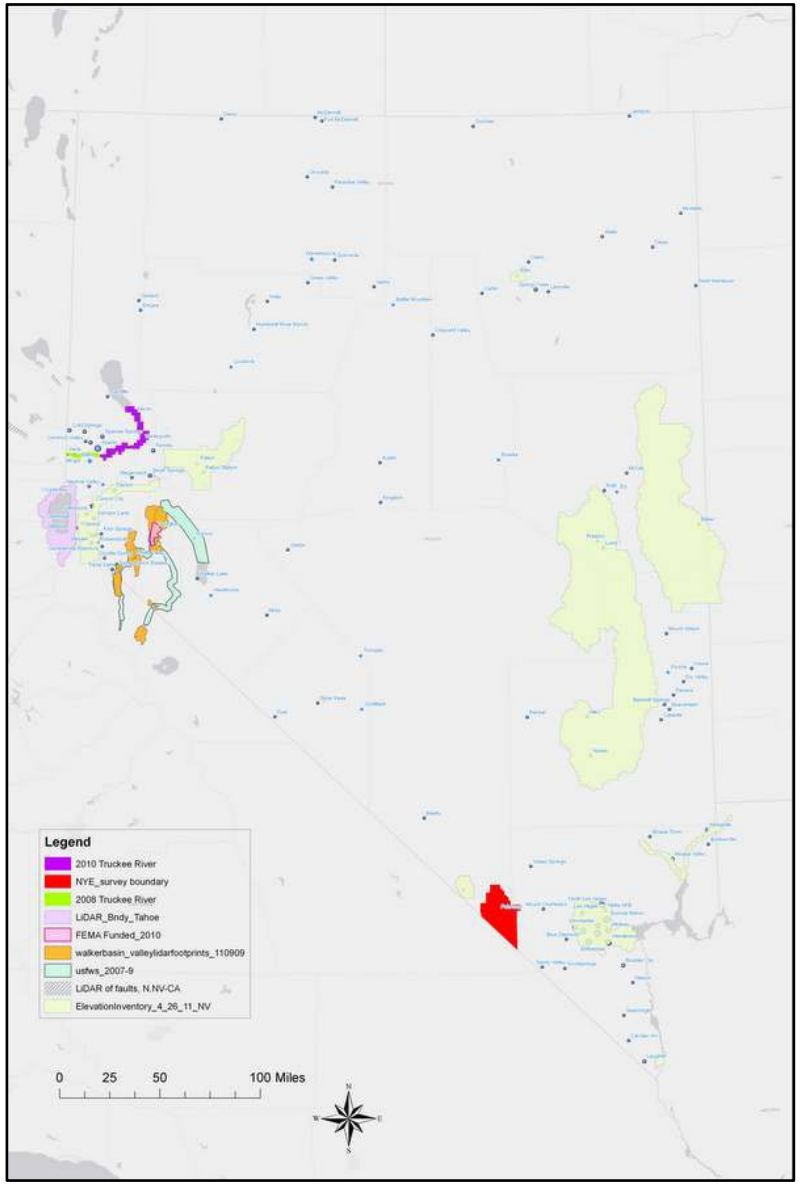
Carol Ostergren, retired

Cynthia Ritmiller
critmiller@usgs.gov
303- 202- 4550

Drew Decker
ddecker@usgs.gov
619-202-6430

A Brief History of NV Strategic Planning for elevation

- 2012-13: Federal Geographic Data Committee grant for strategic planning, led by NGIS and Eric Ingbar on behalf of the Nevada Geographic Information Society
- Collected GIS community needs for lidar and parcels
- Report available at [139-12-4-NV-FinalReport.pdf (fgdc.gov)]



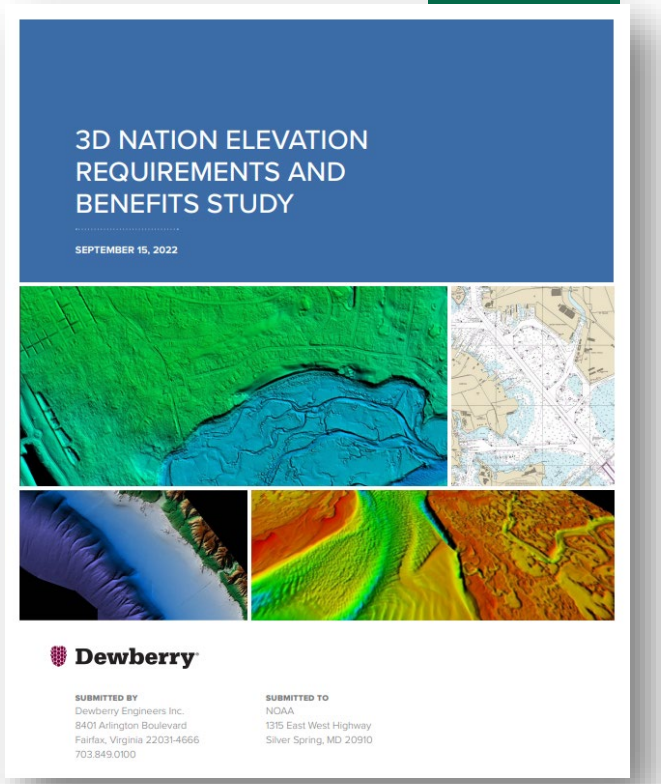
USGS science for a changing world

The National Map
Your Source for Topographic Information

3D Nation Elevation Requirements and Benefits Study

Next Generation of 3DEP

- The first generation of 3DEP provides an essential national baseline of consistent, high-quality data that will continue to grow in value as it is used for comparison with new data collected over time
- 3D Nation Study was commissioned by NOAA and USGS to understand inland, nearshore, and offshore elevation data requirements and benefits
  - $13.5 billion annual benefits documented
  - 1,352 mission critical requirements
  - 45 Federal agencies; 56 state, 99 local, 8 Tribal governments; 34 private companies; 24 others
- USGS used the results of the 3D Nation Study to design the next generation program to provide increased quality levels (QLs) and refresh rates with more flexibility to meet changing user needs



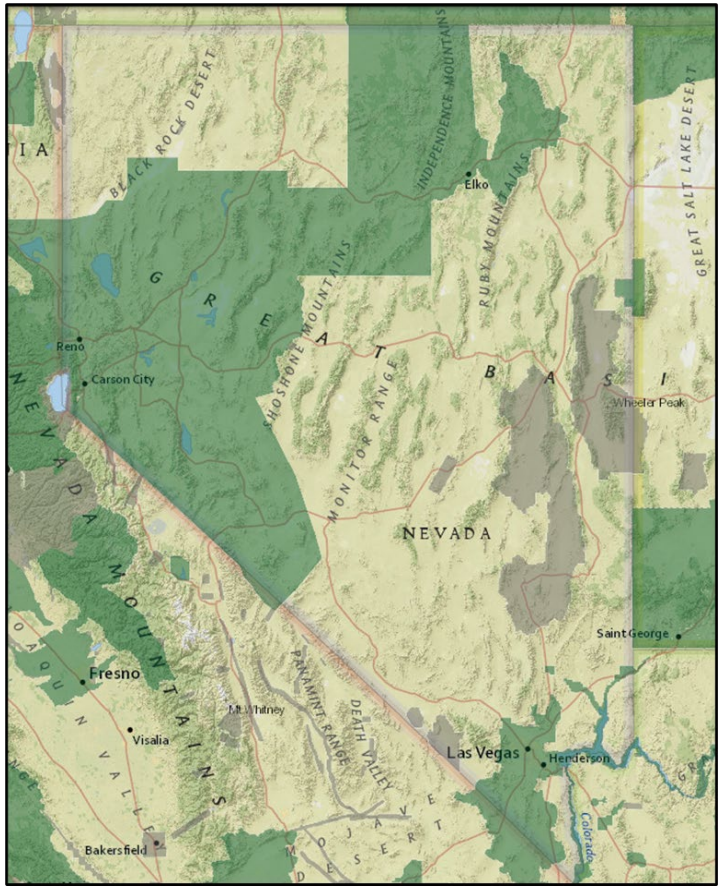
	3DEP Baseline		Next gen 3DEP	
Target Quality Level	QL2 / QL5 in AK	★★☆	★★★	QL1 or QL2 as proposed by partners
Update frequency	8 years	⧗	⧗	5 years CONUS 8 years AK, HI, Territories

USGS science for a changing world

The National Map
Your Source for Topographic Information

3D Nation Study for Nevada

- Effort championed by Nevada Bureau of Mines and Geology, supported by NGIS annual conference and the NV GIS community
- 2018-2022—Major buckets of drivers:
  - Economic Development (strategic minerals, geothermal, industrial)
  - Public Safety (flooding, active seismicity and faulting, landslides, abandoned mines, wildfire)
  - Urban Planning and Infrastructure (rooftop solar, water conservation, canopy, highway design)
  - Education, Archaeology, Cultural Protections
- Report available at: [3D Nation Elevation Requirements and Benefits Study | U.S. Geological Survey (usgs.gov)]



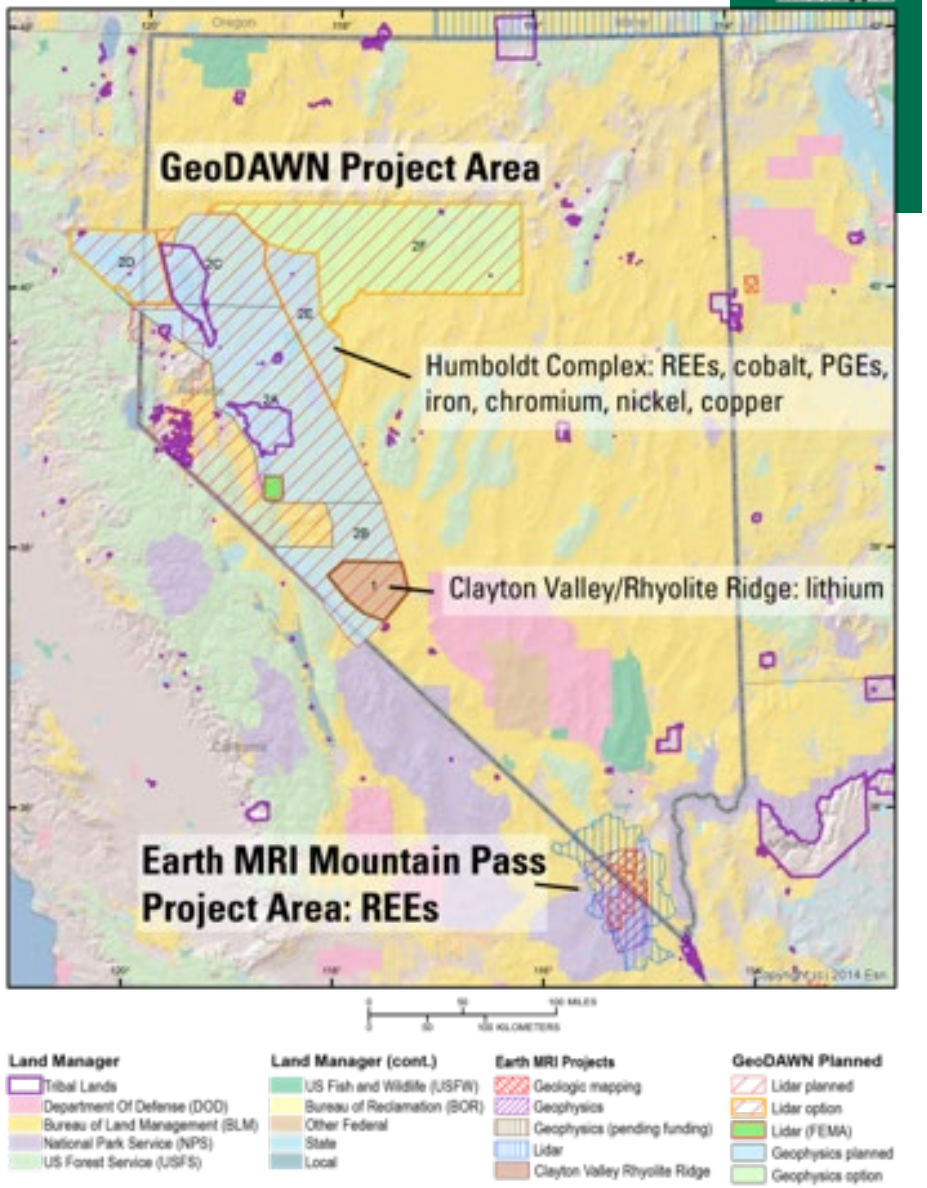
Status: 2020, contracted

USGS science for a changing world

The National Map
Your Source for Topographic Information

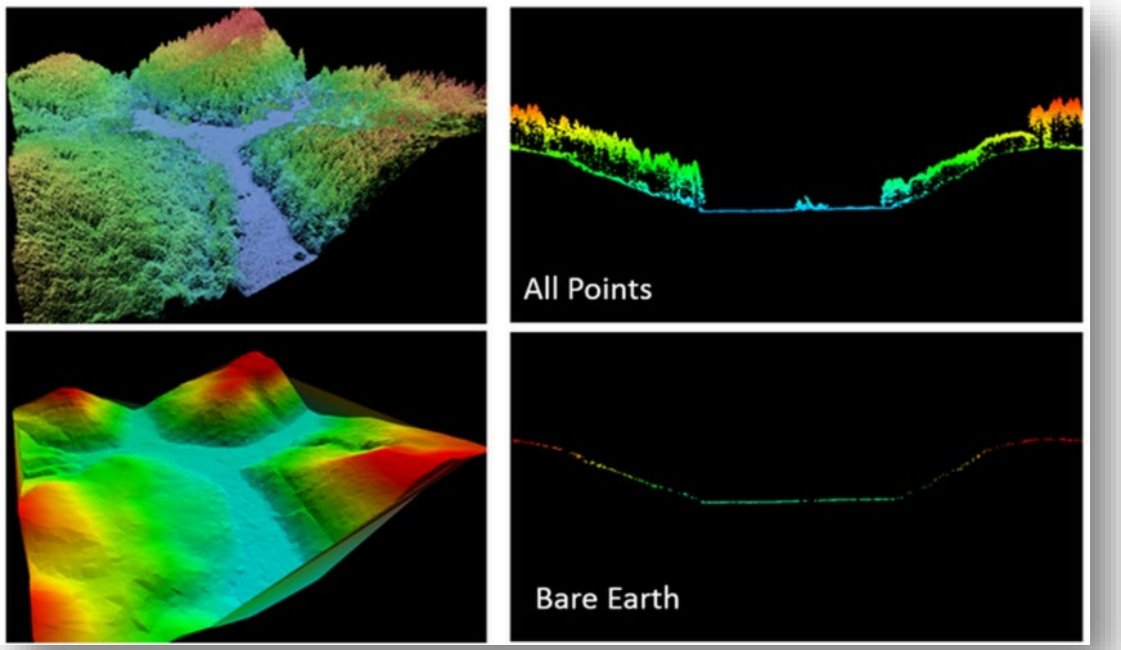
3DEP Partner Recognition

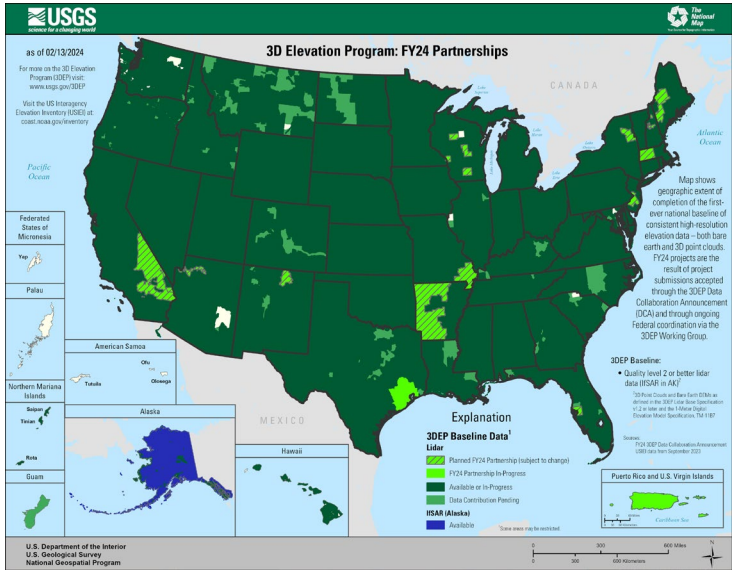
- Pre3DEP to present: **Southern NV Water Authority**
- Early in the 3DEP program: **NV Bureau of Mines and Geology**, with contributions from **Washoe, Lyon and Storey** Counties, **USFS**
- 2020 GeoDawn project: **Department of Energy** Geothermal Technology Office, **NRCS, FEMA, USGS** Earth Mapping Resources Initiative
- 2021-2023: **NRCS, BLM, FEMA, USFS, USBR, USGS**
- Special thank you to Federally recognized Tribes in Nevada for continued support

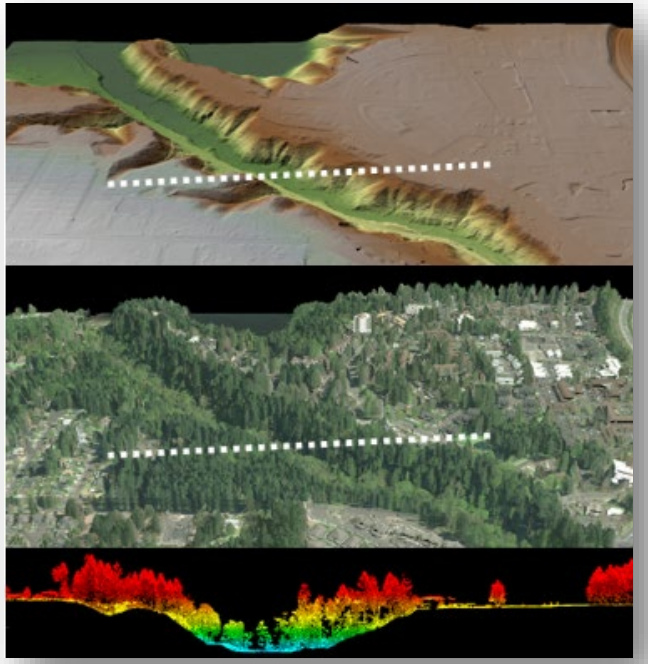


3D Elevation Program (3DEP)

- Complete acquisition of nationwide lidar (IfSAR in AK) to provide the **first-ever national baseline of consistent high-resolution elevation data – both bare earth and 3D point clouds**
- Address Federal, state and, other mission-critical requirements







Bare earth DEM

Lidar point cloud (colorized by aerial photo)

Lidar profile

USGS science for a changing world

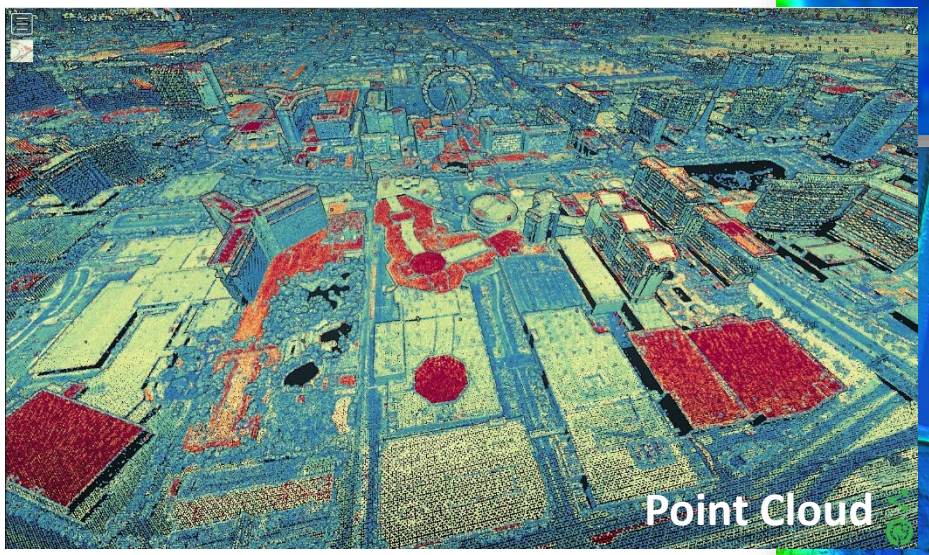
The National Map
Your Source for Topographic Information

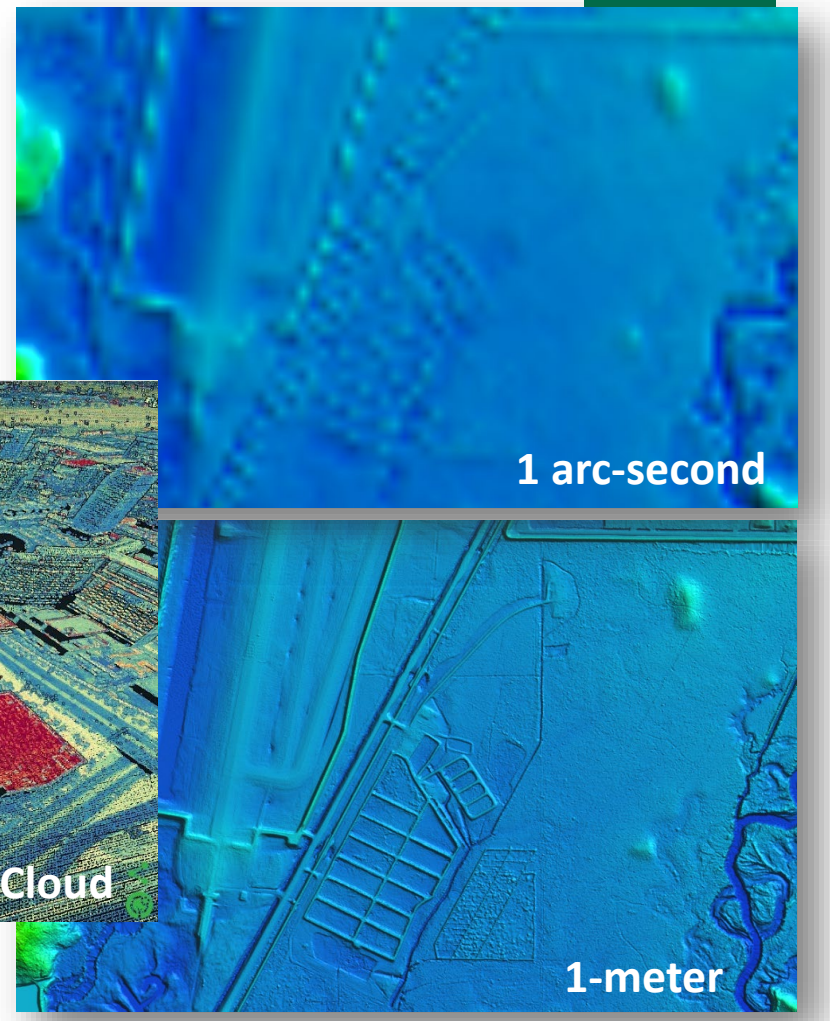
3DEP Products

- Standard DEMs
  - Nationally Seamless
    - 2 Arc Second
    - 1 Arc Second
    - 1/3 Arc Second

  Previously referred to as the National Elevation Dataset (NED)

  - Project-based (seamless within projects)
    - 1/9 Arc Second (legacy)
    - 1-meter
    - 5-meter (IfSAR - Alaska)
- Source Data
  - Lidar Point Clouds
  - Source DEMs (original product resolution)
  - Digital Surface Model (Alaska and Western US)
  - Orthorectified Radar Intensity Imagery (IfSAR - Alaska)



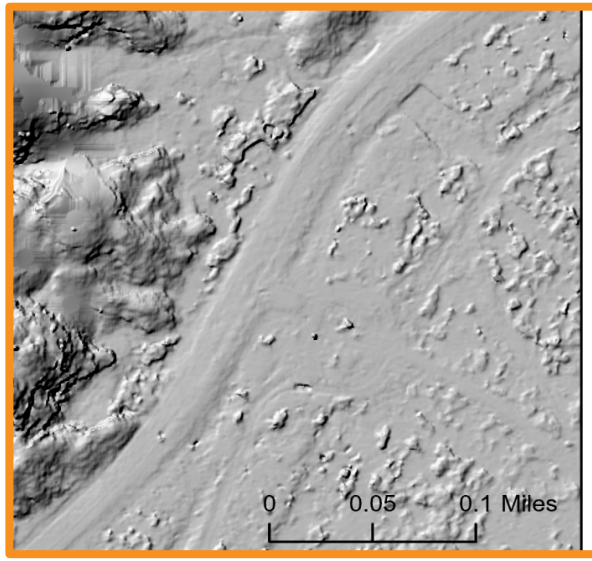


USGS science for a changing world

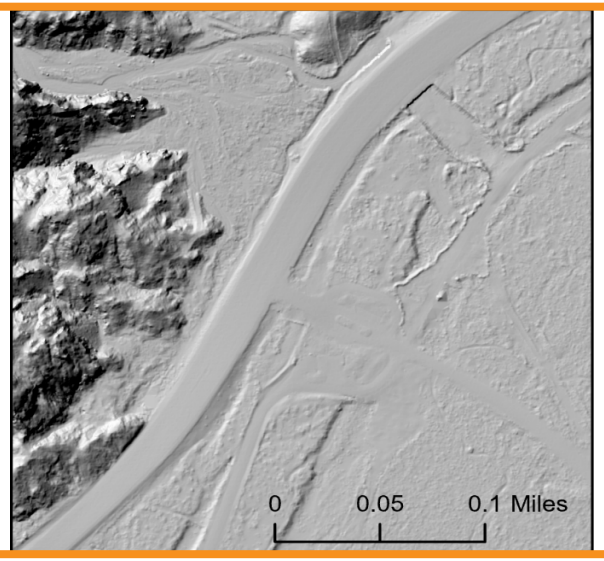
The National Map
Your Source for Topographic Information

Operationalize processing and delivery

Elevation Examples

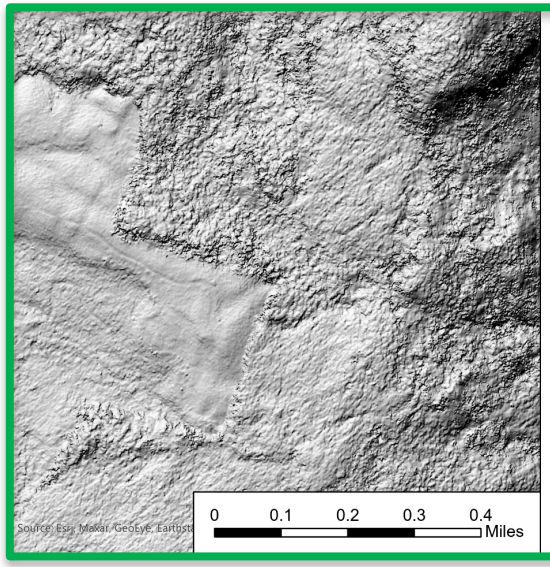


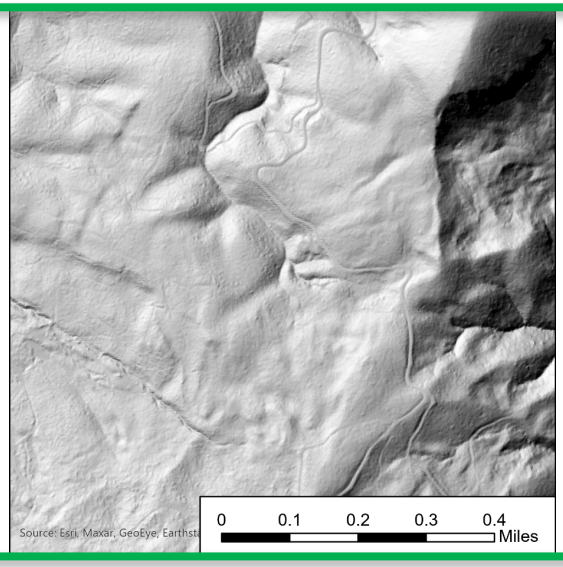
1m Digital Surface Model(DSM)



1m Digital Elevation Model(DEM)

Aerial photo





Building National 3DEP Coverage One Year at a Time

$13B

Potential annual benefit with ROI of 5:1

> 300

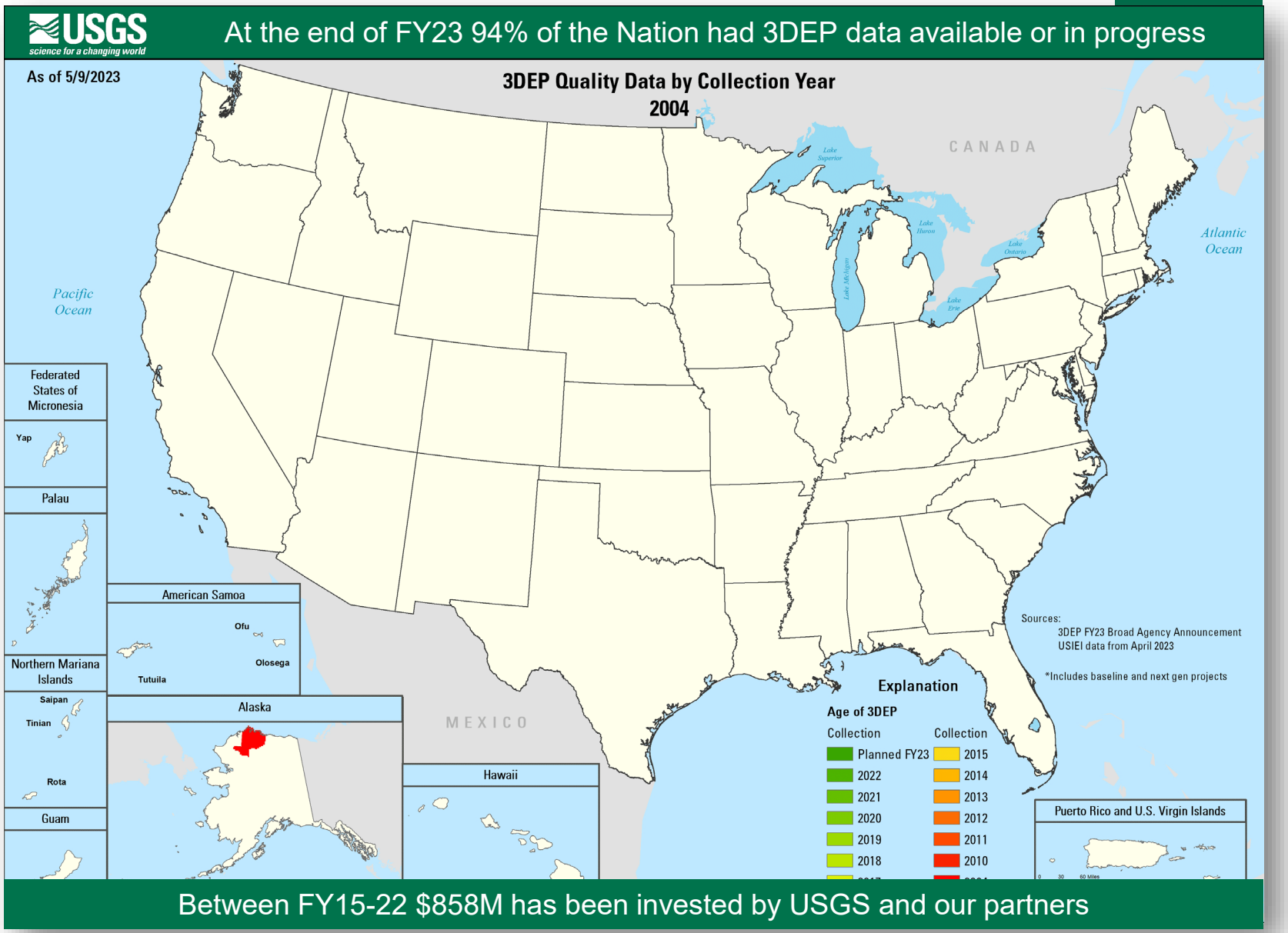
Partner Organizations

65

Percent of total 3DEP cost contributed by partners

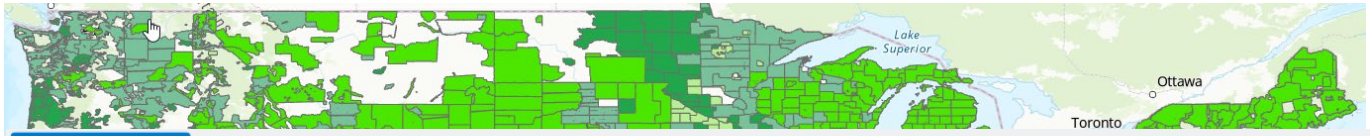
52 Trillion

Lidar data points being distributed



3DEP Spatial Metadata - GeoPackage & Service

https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/metadata/WESM.gpkg or
https://index.nationalmap.gov/arcgis/rest/services/3DEPElevationIndex/MapServer



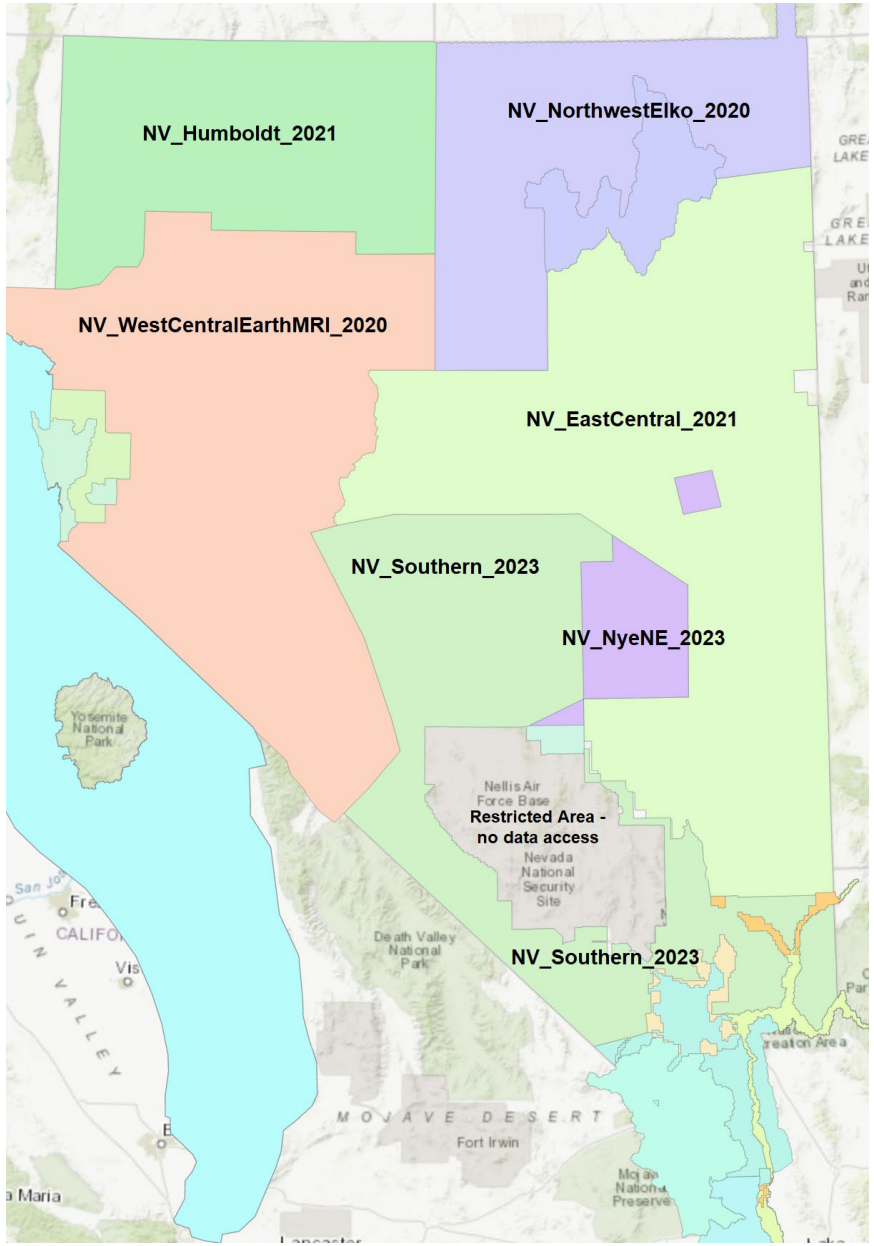
Spatial Indexes &

main.WESM

Field: Add Calculate Selection: Select By Attributes Zoom To Switch Clear Delete Copy

	fid *	geometry *	workunit	workunit_id	project	project_id	collect_start	collect_end	ql	spec	lpc_pub_date	lpc_link	metadata_link	p_method	dem_gs
2075	2871	Polygon	NV_ClarkCo_1_B22	300192	NV_ClarkCounty_B22	228428	7/8/2022	8/1/2022	QL 2	USGS Lidar Base Specifi...	6/20/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2076	2872	Polygon	NV_ClarkCo_2_B22	300193	NV_ClarkCounty_B22	228428	7/8/2022	8/1/2022	QL 1	USGS Lidar Base Specifi...	6/17/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2077	1990	Polygon	NV_ClarkCounty_B1_20...	179230	NV_ClarkCounty_2018_...	179233	4/14/2018	4/17/2018	QL 2	USGS Lidar Base Specifi...	5/21/2021	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2078	2812	Polygon	NV_EastCentral_1_D21	223581	NV_EastCentral_2021_...	223584	11/3/2021	9/9/2022	QL 2	USGS Lidar Base Specifi...	4/5/2024	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2079	2804	Polygon	NV_Humboldt_1_2021	223209	NV_Humboldt_2021_D21	223212	9/23/2021	10/11/2021	QL 1	USGS Lidar Base Specifi...	5/5/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2080	2802	Polygon	NV_Humboldt_2_2021	300240	NV_Humboldt_2021_D21	223212	9/13/2021	10/15/2021	QL 2	USGS Lidar Base Specifi...	2/15/2024	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2081	1462	Polygon	NV_LasVegas_QL1_2016	63530	NV_Las_Vegas_Region_...	63308	4/21/2016	5/16/2016	QL 1	USGS Lidar Base Specifi...	4/5/2018	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2082	1461	Polygon	NV_LasVegas_QL2_2016	63305	NV_Las_Vegas_Region_...	63308	4/21/2016	5/16/2016	QL 2	USGS Lidar Base Specifi...	4/8/2018	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2083	476	Polygon	NV_LASVEGASVALLEY_...	-1498	Not_Applicable_19_Arc_...	-1937	6/8/2010	6/9/2010	Other	Other	9/12/2012	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2084	2697	Polygon	NV_NWElko_1_D20	198530	NV_NorthWestElko_202...	198533	10/3/2020	11/8/2021	QL 2	USGS Lidar Base Specifi...	12/27/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2085	2702	Polygon	NV_NWElko_2_D20	300145	NV_NorthWestElko_202...	198533	10/9/2020	11/8/2021	QL 2	USGS Lidar Base Specifi...	4/21/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2086	1820	Polygon	NV_Reno_Carson_QL1_...	74268	NV_Reno_Carson_Urba...	74266	10/12/2017	10/27/2017	QL 1	USGS Lidar Base Specifi...	11/13/2018	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2087	1821	Polygon	NV_Reno_Carson_QL2_...	74263	NV_Reno_Carson_Urba...	74266	10/12/2017	10/27/2017	QL 2	USGS Lidar Base Specifi...	11/8/2018	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2088	1470	Polygon	NV_UpperHumboldt_2...	71008	NV_UpperHumboldt_2...	71011	5/2/2016	6/2/2016	QL 2	USGS Lidar Base Specifi...	2/8/2018	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2089	2706	Polygon	NV_WestCentralEarthM...	198159	NV_WestCentral_Earth...	198162	10/15/2020	11/4/2020	QL 2	USGS Lidar Base Specifi...	1/11/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2090	2708	Polygon	NV_WestCentralEarthM...	231490	NV_WestCentral_Earth...	198162	10/18/2020	11/20/2020	QL 2	USGS Lidar Base Specifi...	1/1/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2091	2705	Polygon	NV_WestCentralEarthM...	300013	NV_WestCentral_Earth...	198162	10/15/2020	11/3/2020	QL 2	USGS Lidar Base Specifi...	2/25/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2092	2707	Polygon	NV_WestCentralEarthM...	300014	NV_WestCentral_Earth...	198162	10/18/2020	11/6/2020	QL 2	USGS Lidar Base Specifi...	1/4/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2093	2709	Polygon	NV_WestCentralEarthM...	300015	NV_WestCentral_Earth...	198162	10/22/2020	11/20/2020	QL 2	USGS Lidar Base Specifi...	1/12/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	
2094	2704	Polygon	NV_WestCentralEarthM...	300016	NV_WestCentral_Earth...	198162	10/13/2020	10/27/2020	QL 1	USGS Lidar Base Specifi...	1/28/2023	https://rockyweb.usgs.gov	http://prd-tnm.s3.amazor	linear-mode lidar	

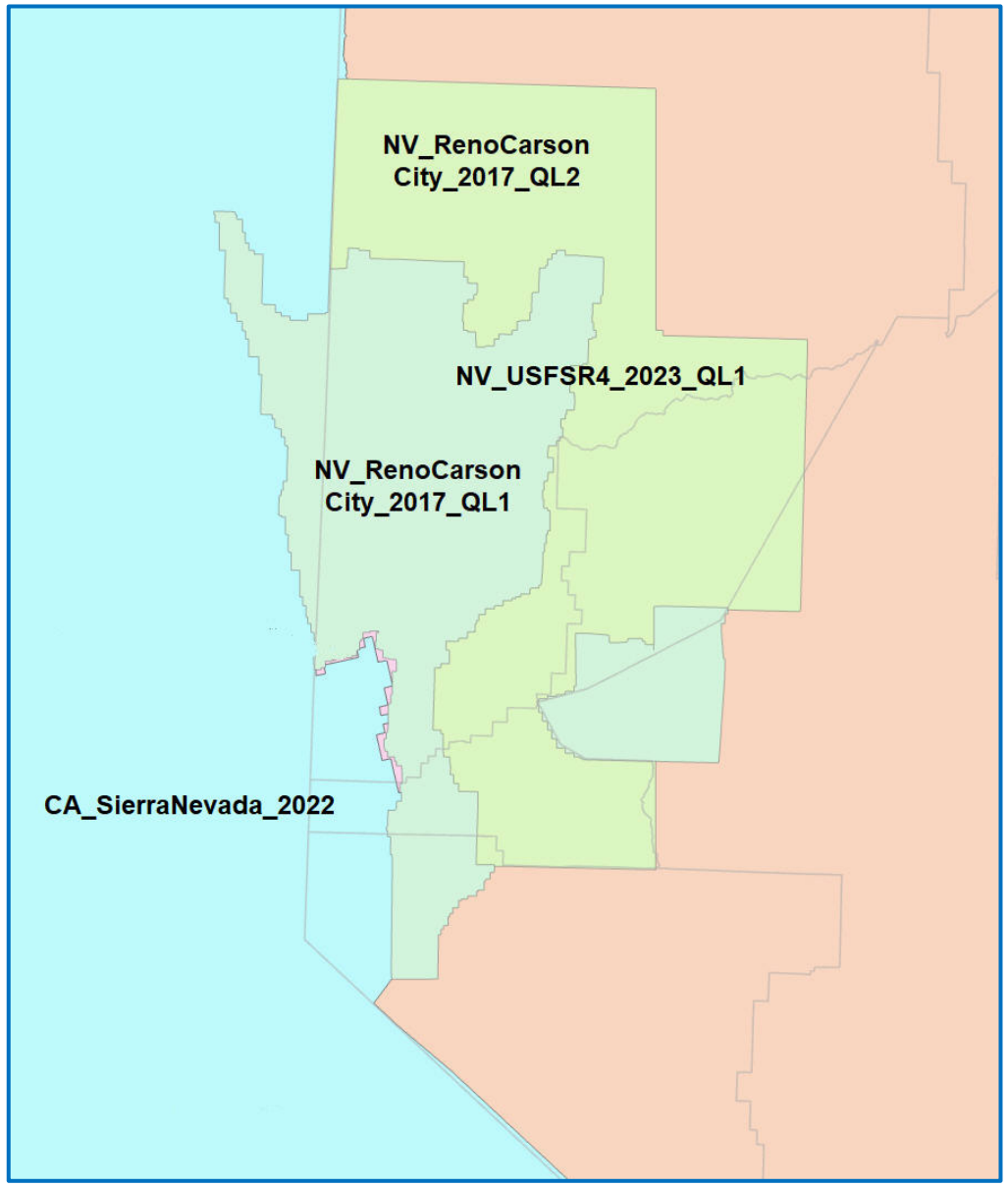
Nevada Status

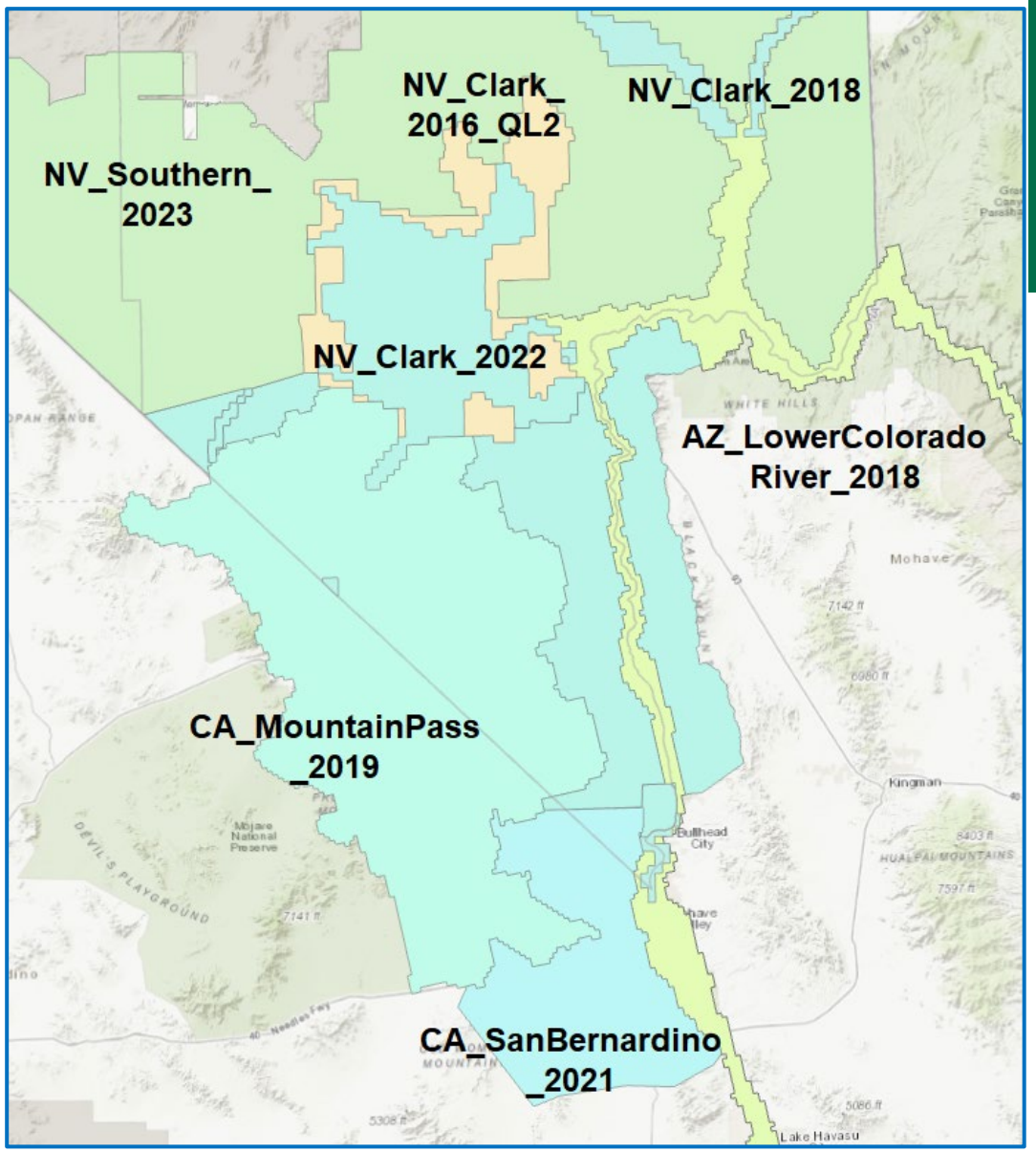


USGS science for a changing world

The National Map
Your Source for Topographic Information

US Interagency Elevation Inventory: https://coast.noaa.gov/inventory/





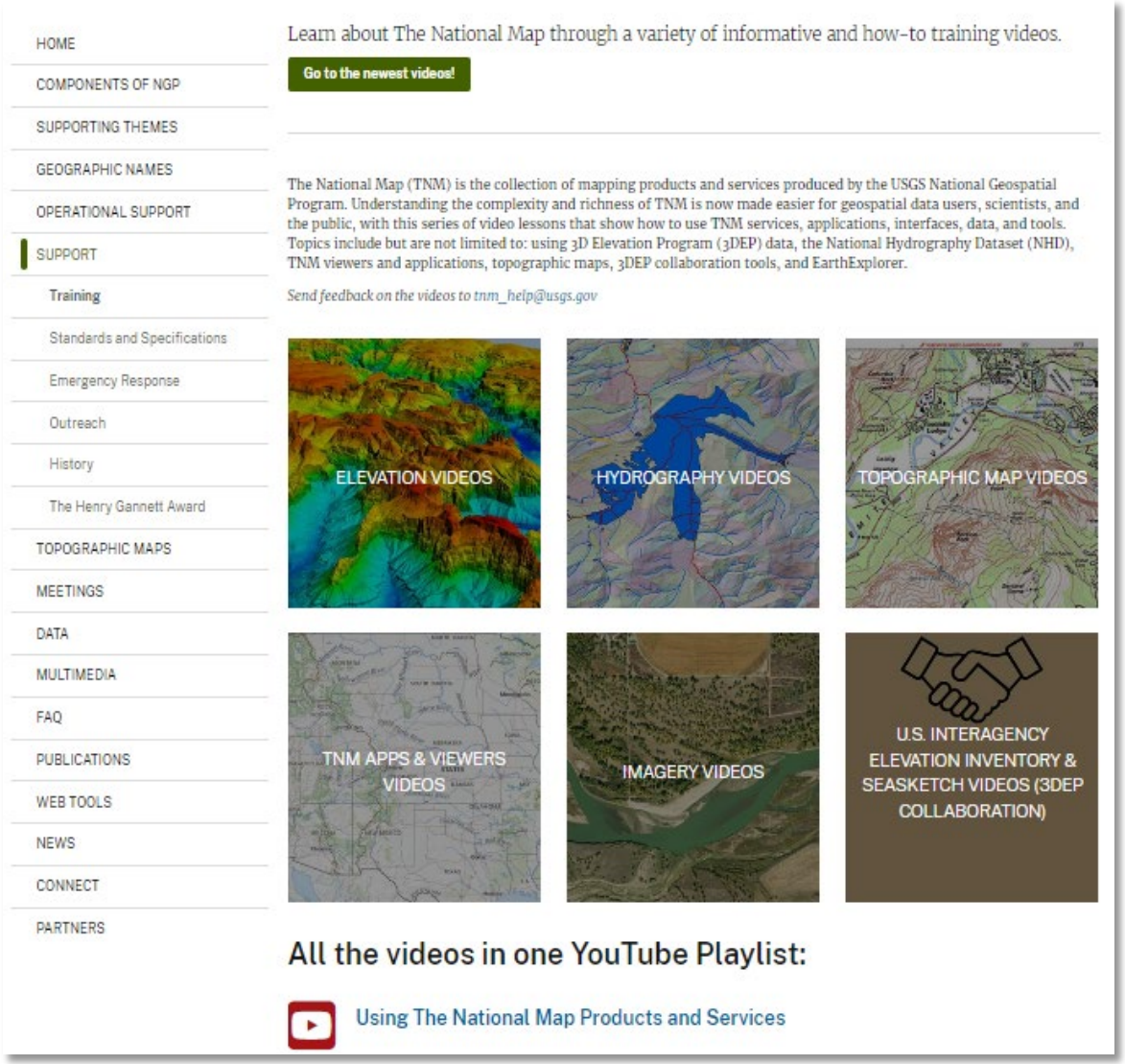
USGS science for a changing world

The National Map
Your Source for Topographic Information

NV Current Status

Project	Year	QL	Status	
NV_Southern	2023	1	In progress	Target Q3 2025
NV_USFSR4	2023	1	In progress	Target Q3 2025
NV_NyeNE	2023	1	In progress	Target Q3 2024
NV_ClarkCounty	2022	1	Complete	
NV_Humboldt	2021	1,2	Complete	
NV_EastCentral	2021	1,2	Partially Available	Q2/Q3 2024
NV_NWElko	2020	1,2	Complete	
NV_WCEarthMRI	2020	2	Complete	

The National Map Training Videos



- TNM Downloader: Lessons 4a - 4d
- TNM Services: Lessons 5a-b
- TNM Viewer: Lessons 3a - 3c

https://www.usgs.gov/programs/national-geospatial-program/national-map-training

Access 3DEP Data

The 3DEP products and services available through The National Map consist of lidar point clouds and digital elevation models (DEMs) at various horizontal resolutions. All 3DEP products are available, free of charge and without use restrictions.

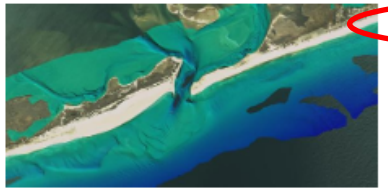
GIS Data Download

3DEP Spatial Metadata

Spatial metadata for the 3D Elevation Program (3DEP) is now published and available by work unit in the Work Unit Extent Spatial Metadata (WESM) geopackage.

Learn more

3DEP Product Metadata



Two classes of metadata are provided for each product: textual metadata (XML files) and spatial metadata (Geopackage file).

Learn more

Quick Links

- 3DEP Lidar Explorer
- 3DEP Dynamic Elevation Viewer
- Lidar Availability Status Application
- 1-meter DEM Availability Status Application
- The National Map Services
- The National Map - Data Delivery

Source Data Products

Source data products include lidar point clouds, source (original) resolution DEMs from which the 3DEP standard DEM datasets were produced, and additional data types produced from IfSAR collections.

Facts Block

NOAA staff wrote two helpful blog posts:

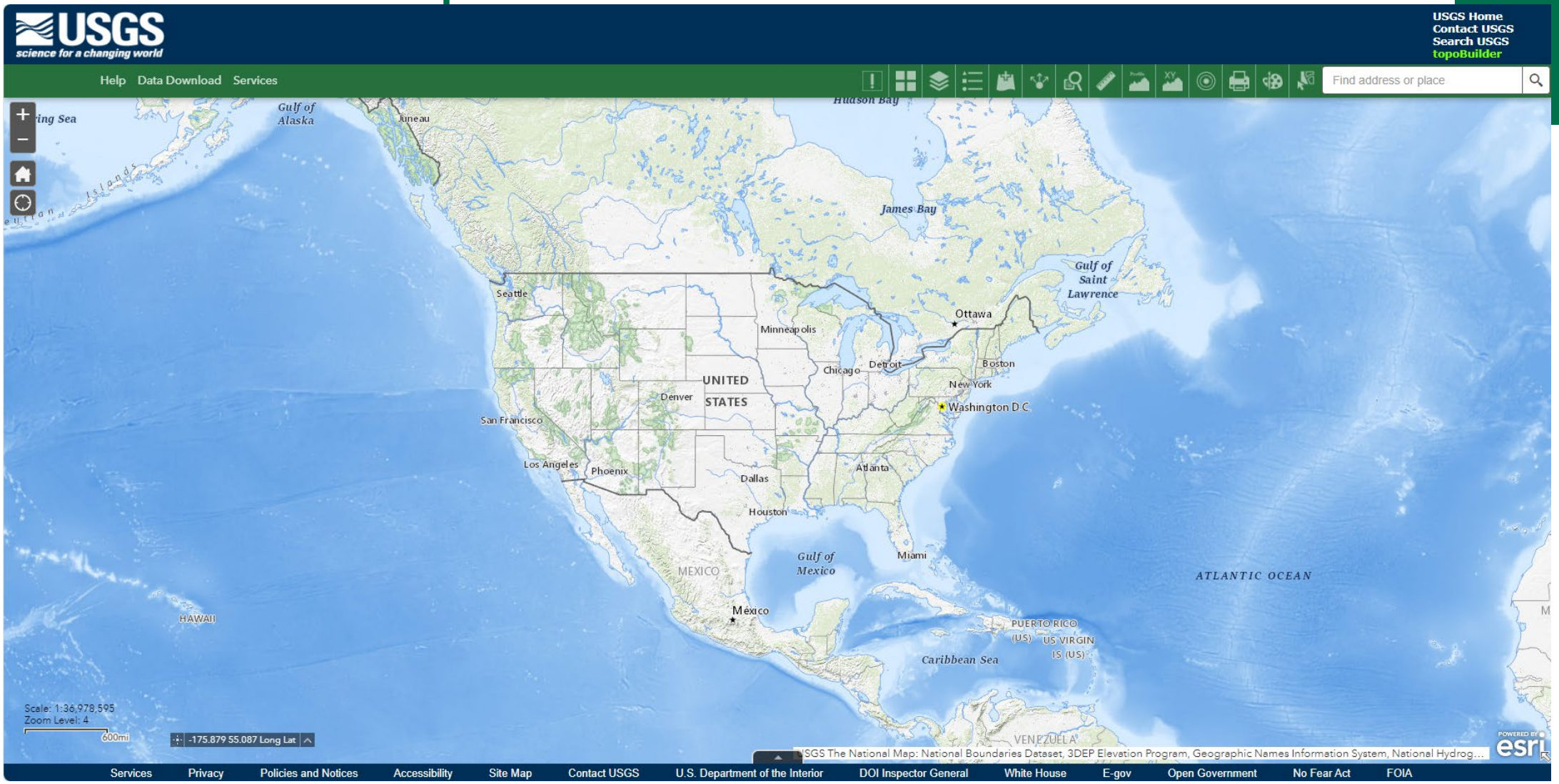
- Good ol' Rockyweb

https://www.usgs.gov/3d-elevation-program/about-3dep-products-services

Accessing Data

1. The National Map Viewer https://apps.nationalmap.gov/viewer/
   i. TNM Video Series: Lessons 3a - 3c
2. The National Map Services https://apps.nationalmap.gov/services/
   i. TNM Video Series: Lessons 5a-b
3. The National Map Downloader https://apps.nationalmap.gov/downloader/
   i. TNM Video Series: Lessons 4a - 4d
4. Rockyweb (Cloud Storage) https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/
5. LidarExplorer https://apps.nationalmap.gov/lidar-explorer/

The National Map Viewer

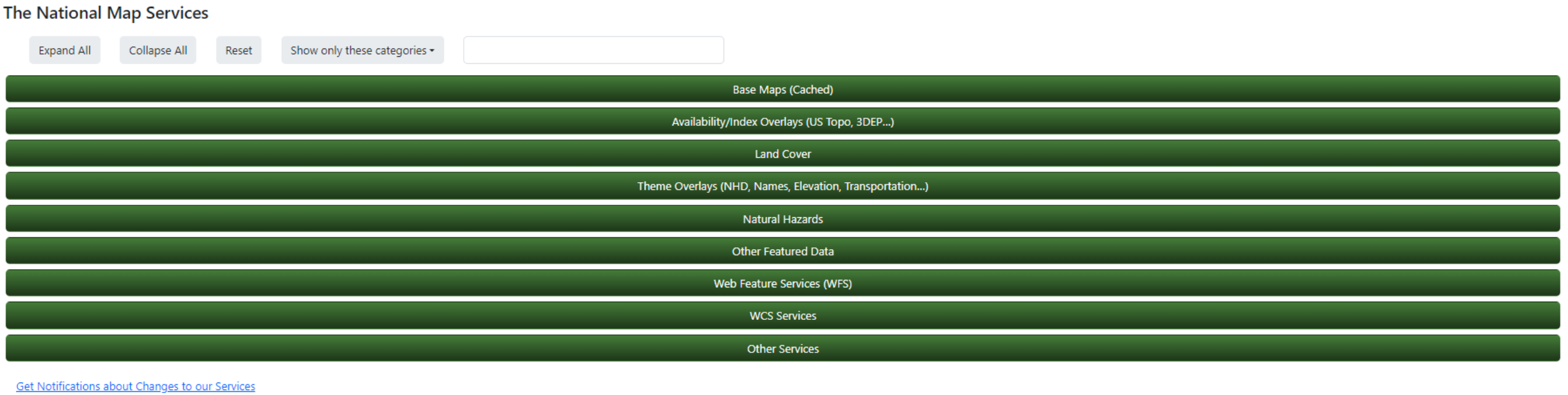


USGS science for a changing world

The National Map
Your Source for Topographic Information

Viewer: https://apps.nationalmap.gov/viewer/

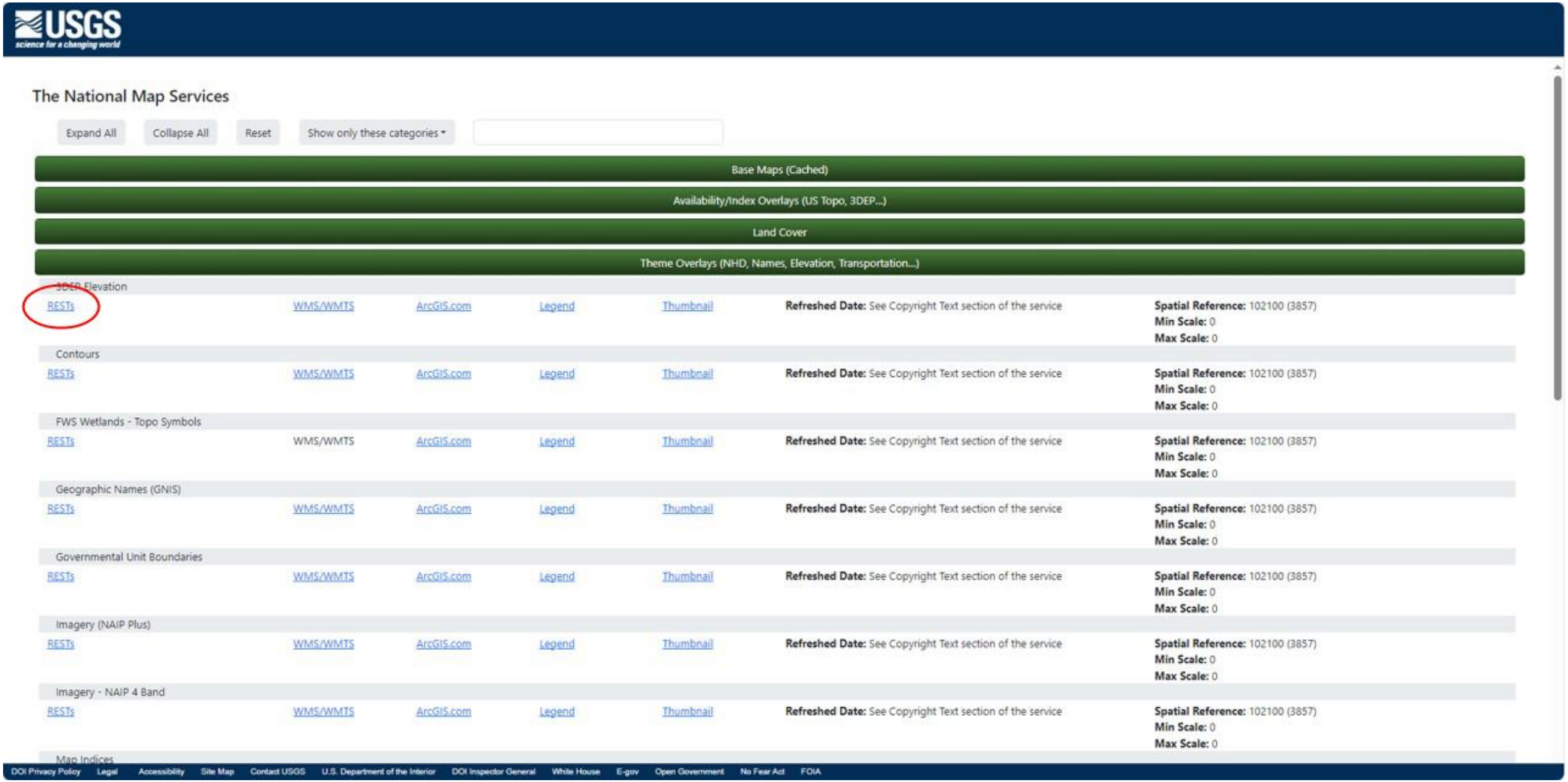
National Map Services



USGS science for a changing world

The National Map
Your Source for Topographic Information

https://apps.nationalmap.gov/services/



USGS science for a changing world

The National Map
Your Source for Topographic Information

https://apps.nationalmap.gov/services/

ArcGIS REST Services Directory

3DEPElevation (ImageServer)

View In: ArcGIS JavaScript ArcGIS Online Map Viewer ArcGIS Earth ArcMap

View Footprint In: ArcGIS Online Map Viewer

Service Description: The USGS 3D Elevation Program (3DEP) Bare Earth DEM Dynamic service is based on multi-resolution USGS DEM sources and provides dynamic functions for visualization. These functions include: Hillshade, Aspect Map, Hillshade Stretched, Multi-directional Hillshade, Slope Map, Elevation Tinted Hillshade, Contour. In addition the OGC Web Map Service (WMS) and Web Coverage Service (WCS) interfaces are enabled. Data available in this map service reflects all 3DEP DEM data published as of February 26, 2024.

Name: 3DEPElevation

Description: The USGS 3D Elevation Program (3DEP) Bare Earth DEM Dynamic service is based on multi-resolution USGS DEM sources and provides dynamic functions for visualization. These functions include: Hillshade, Aspect Map, Hillshade Stretched, Multi-directional Hillshade, Slope Map, Elevation Tinted Hillshade, Contour. In addition the OGC Web Map Service (WMS) and Web Coverage Service (WCS) interfaces are enabled. Data available in this map service reflects all 3DEP DEM data published as of February 26, 2024.

Single Fused Map Cache: false

Extent:
XMin: -2.00375070672E7
YMin: -1689391.823360186
XMax: 2.0037507532527123E7
YMax: 1.88090019719E7
Spatial Reference: 102100 (3857)

Initial Extent:
XMin: -2.00375070672E7
YMin: -1689391.823360186
XMax: 2.0037507532527123E7
YMax: 1.88090019719E7
Spatial Reference: 102100 (3857)

Full Extent:
XMin: -2.00375070672E7
YMin: -1689391.823360186
XMax: 2.0037507532527123E7
YMax: 1.88090019719E7
Spatial Reference: 102100 (3857)

Pixel Size X: 0.9999999900119095

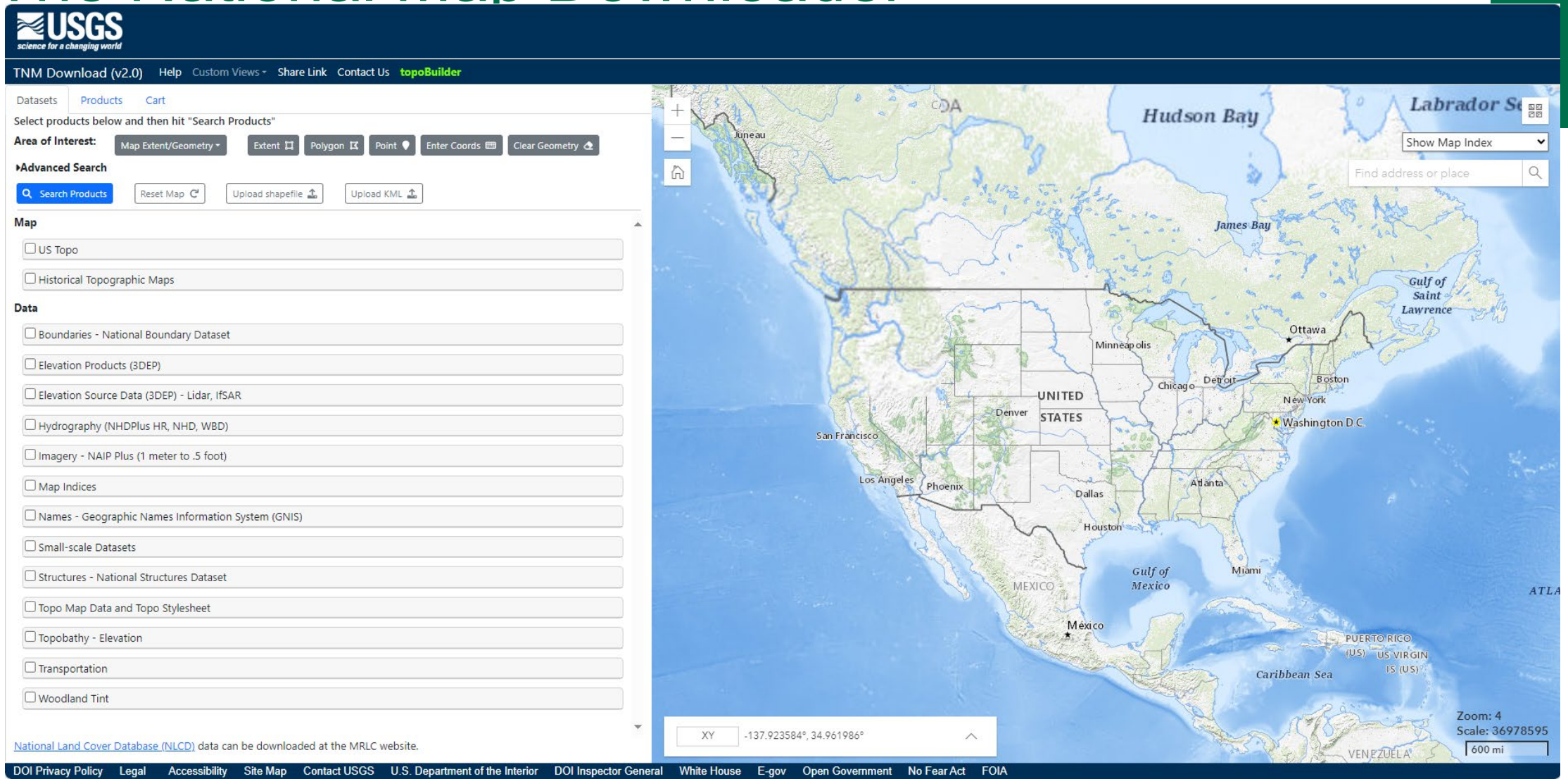
Pixel Size Y: 0.9999999900119095

Band Count: 1

Pixel Type: F32

RasterFunction Infos: {"rasterFunctionInfos": [{ "name": "Hillshade Gray", "description": "Provides a hillshaded surface generated dynamically using the hillshade server-side function on the elevation layer with a solar azimuth of 315 degrees and solar altitude of 45 degrees.", "help": "" }, { "name": "Aspect Degrees", "description": "This server-side function will apply an on-the-fly process to the input elevation data to generate an aspect layer.", "help": "Raster Function Templates may be activated in ArcMap by loading the service into the map, right clicking on the service in the Table of Contents to select Properties, and selecting the desired function from the Server Functions tab. For help with invoking raster functions via REST calls, see http://resources.arcgis.com/en/help/rest/apiref/. " }, { "name": "Aspect Map", "description": "This server-side function will apply an on-the-fly process to the input

The National Map Downloader



USGS science for a changing world

The National Map
Your Source for Topographic Information

https://apps.nationalmap.gov/downloader/

USGS science for a changing world

TNM Download (v2.0) Help Custom Views Share Link Contact Us topoBuilder

Datasets Products Cart

3

Select products below and then hit "Search Products"

Area of Interest: Map Extent/Geometry | Extent | Polygon | Point | Enter Coords | Clear Geometry

Advanced Search 4

Search Products | Reset Map | Upload shapefile | Upload KML

Map

- [ ] US Topo
- [ ] Historical Topographic Maps

Data 1

- [ ] Boundaries - National Boundary Dataset
- [ ] Elevation Products (3DEP)
- [x] Elevation Source Data (3DEP) - Lidar, IfSAR

Subcategories

- [ ] Select All
- [x] DEM Source (OPR) — Show
- [ ] Ifsar Digital Surface Model (DSM) — Show
- [ ] Ifsar Orthorectified Radar Image (ORI) — Show
- [ ] Lidar Point Cloud (LPC) — Show

Data Extent

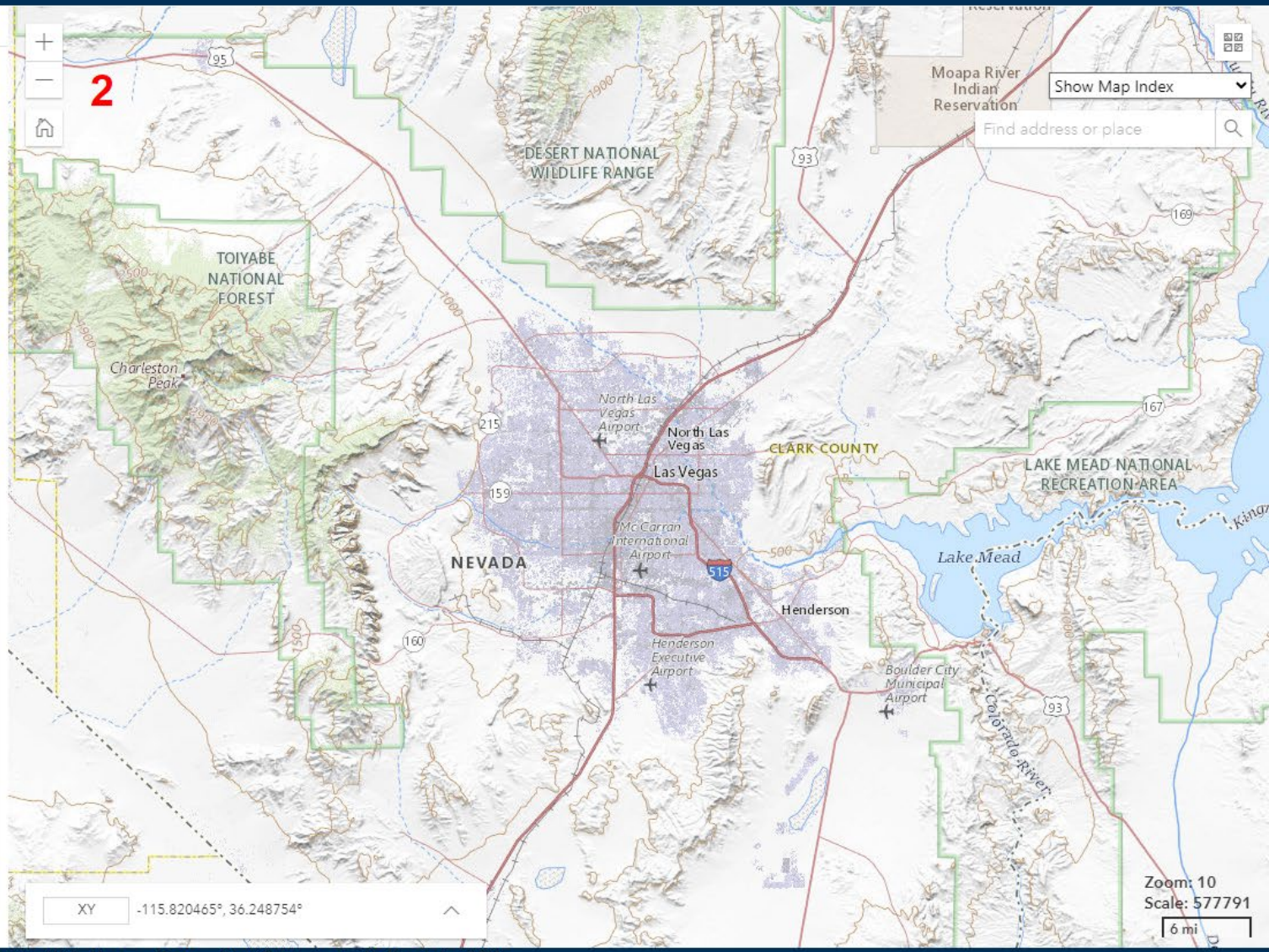
- (•) Varies

File Formats

- ( ) LAS,LAZ
- ( ) TIFF
- (•) All

National Land Cover Database (NLCD) data can be downloaded at the MRLC website.

2



DOI Privacy Policy | Legal | Accessibility | Site Map | Contact USGS | U.S. Department of the Interior | DOI Inspector General | White House | E-gov | Open Government | No Fear Act | FOIA

USGS science for a changing world

TNM Download (v2.0) Help Custom Views Share Link Contact Us topoBuilder

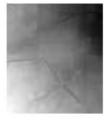
Datasets | Products | Cart

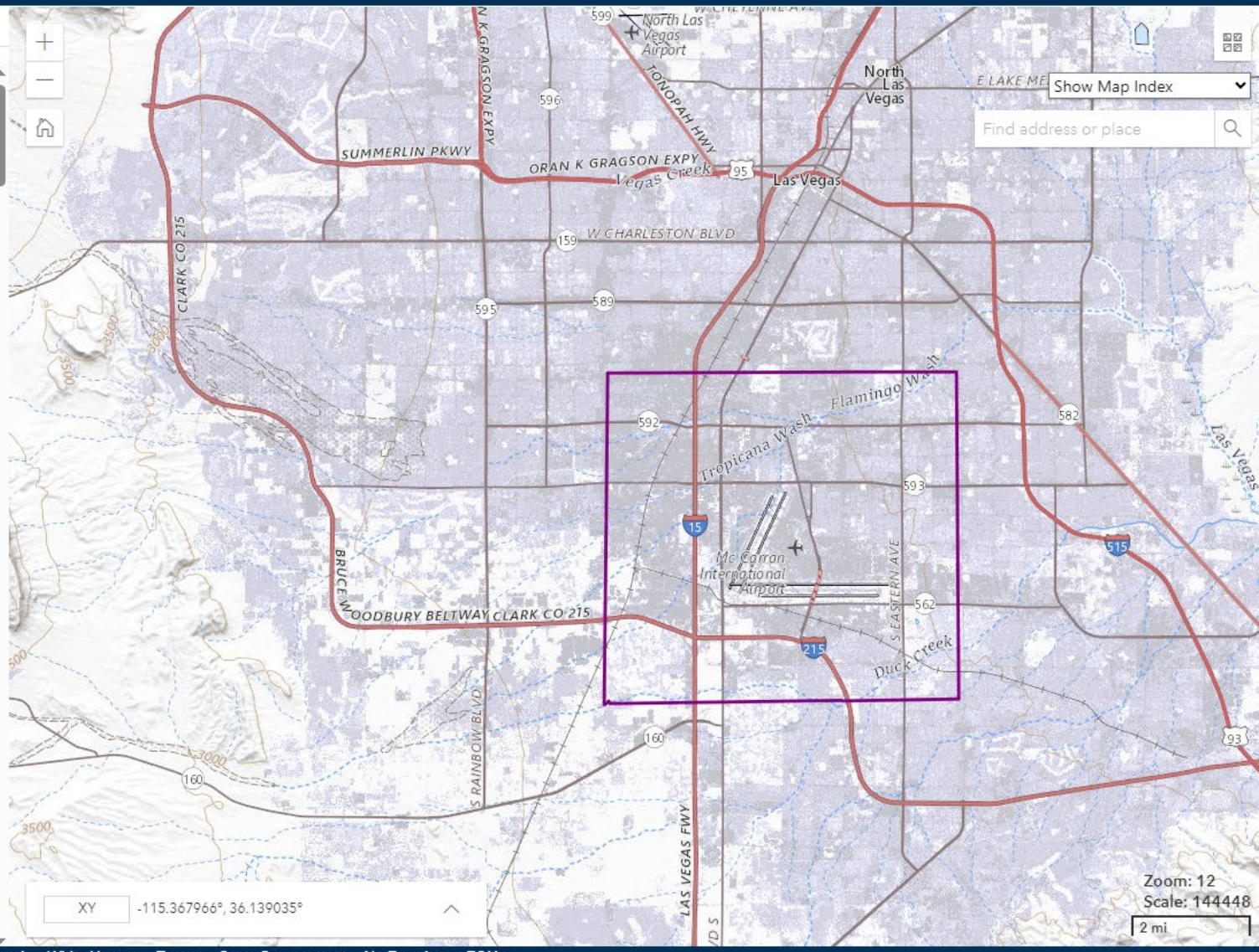
Clear Results

Collapse View National Elevation Dataset (NED) (50 results) Show All Footprints Show All Thumbnails

1 through 50 of 50 results

<< Previous 1 Next >>

	USGS Original Product Resolution NV_ClarkCounty_B22 dem_762800_26715920 **Published Date:** 2023-06-14 **Metadata Updated:** 2023-06-18 **Format:** GeoTIFF **Extent:** Varies	Footprint Thumbnail Zoom To Info/Metadata Vendor Metadata Download Link (TIF)
	USGS Original Product Resolution NV_ClarkCounty_B22 dem_762800_26721200 **Published Date:** 2023-06-14 **Metadata Updated:** 2023-06-18 **Format:** GeoTIFF **Extent:** Varies	Footprint Thumbnail Zoom To Info/Metadata Vendor Metadata Download Link (TIF)
	USGS Original Product Resolution NV_ClarkCounty_B22 dem_762800_26726480 **Published Date:** 2023-06-14 **Metadata Updated:** 2023-06-18 **Format:** GeoTIFF **Extent:** Varies	Footprint Thumbnail Zoom To Info/Metadata Vendor Metadata Download Link (TIF)
	USGS Original Product Resolution NV_ClarkCounty_B22 dem_762800_26731760 **Published Date:** 2023-06-14 **Metadata Updated:** 2023-06-18 **Format:** GeoTIFF **Extent:** Varies	Footprint Thumbnail Zoom To Info/Metadata Vendor Metadata Download Link (TIF)
	USGS Original Product Resolution NV_ClarkCounty_B22 dem_762800_26737040 **Published Date:** 2023-06-14 **Metadata Updated:** 2023-06-18 **Format:** GeoTIFF **Extent:** Varies	Footprint Thumbnail Zoom To Info/Metadata Vendor Metadata Download Link (TIF)



The National Map

Downloader Manager/uGET

uGet is an open source download manager application which supports many platforms. It is portable and can be downloaded for usage without installation. The instructions below describe how to use uGet to download files using URLs saved in a text or CSV file from TNM Download. Video tutorial available here: https://www.youtube.com/watch?v=QhN0Zuy1yKc

USGS does not assume responsibility for usage or functionality of uGet software for downloading data. More information about uGet can be found on Home, Features, and Help pages on the uGet website.

Download and Setup - Windows

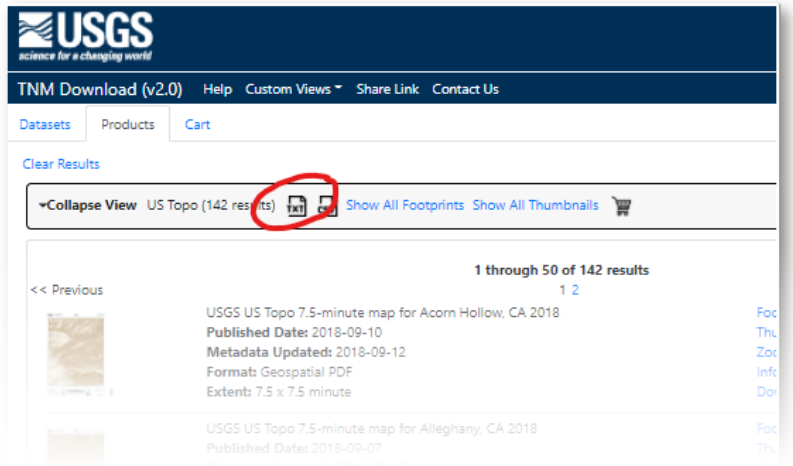
- 7-zip is required to unzip the .7z file you will download in the third bullet below. Installation Instructions.
- Go to https://ugetdm.com/downloads/windows/ or https://sourceforge.net/projects/urlget/.
- Download the package zip (.7z) file. Select "without translation files" unless multi-language support is necessary.
- Unzip the downloaded .7z package file in a folder using 7-zip which you installed in the first bullet above.
- Run the application by double-clicking \bin\uget.exe in the installation folder.
- Once the uGet program is installed, you can run it as many times as you need to in the future. You do not need to install it again.

Instructions - using Text file as input

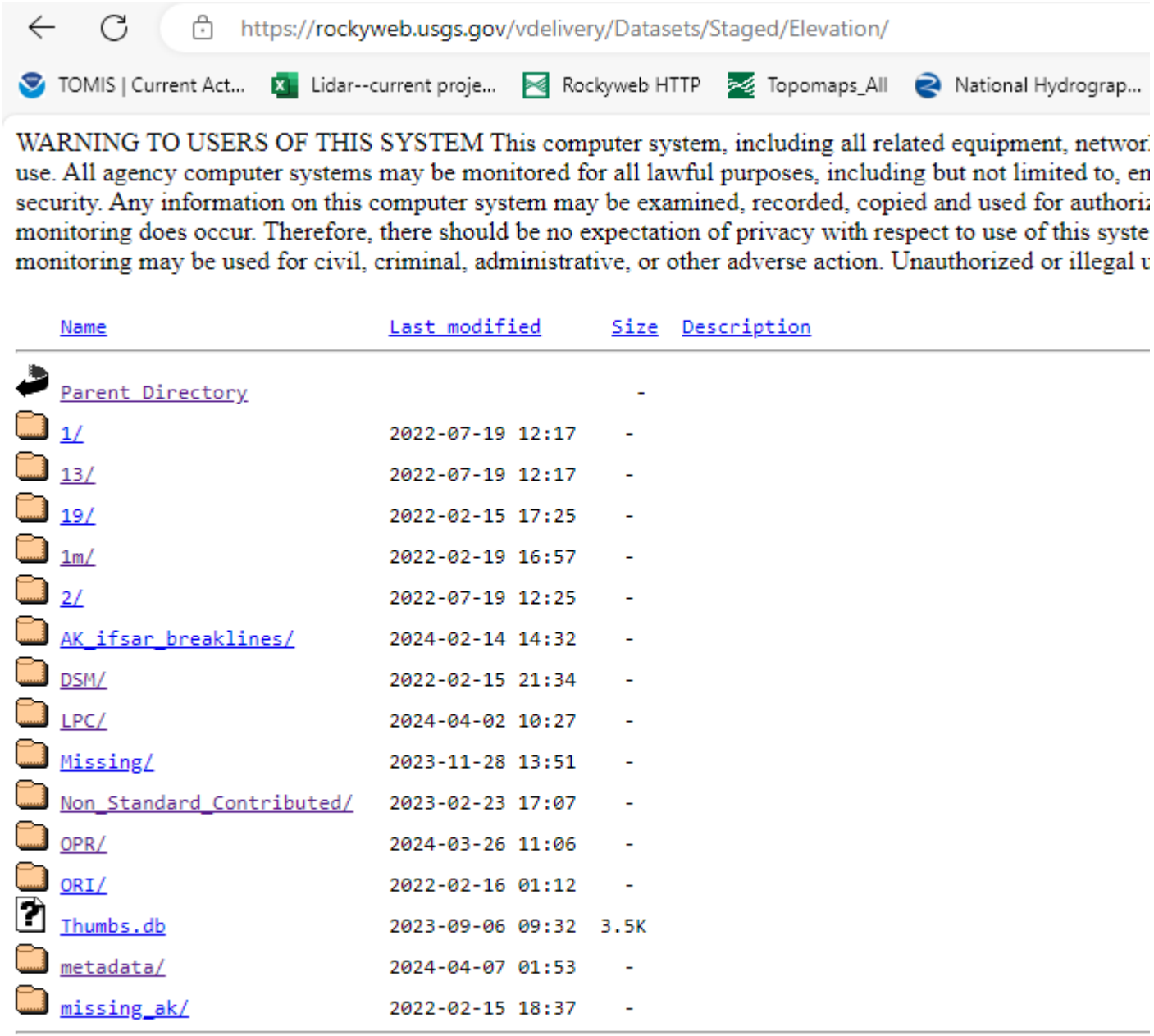
Preparing Input Text File

In the TNM Download application, download URLs can be saved in a text file using one of the two methods described below:

Option #1
After product search is completed, click “Save as Text” in the Product view.



Rockyweb

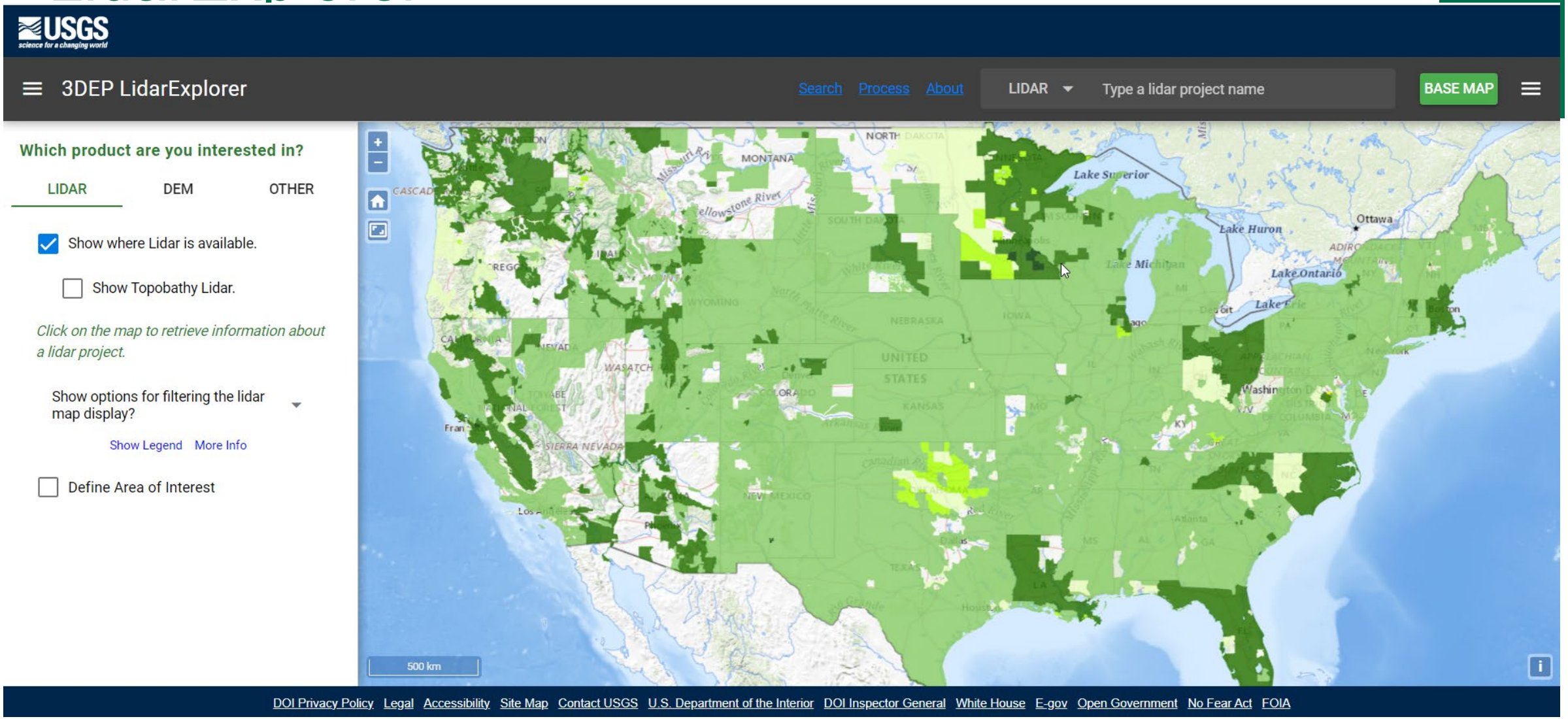


USGS science for a changing world

The National M
Your Source for Topographic Infor

https://rockyweb.usgs.gov/vdelivery/Datasets/Staged/Elevation/

LidarExplorer



USGS science for a changing world

The National Map
Your Source for Topographic Information

https://apps.nationalmap.gov/lidar-explorer/

USGS science for a changing world

3DEP LidarExplorer

Search Process About

LIDAR | Type a lidar project name | BASE MAP

Which product are you interested in?

LIDAR DEM OTHER

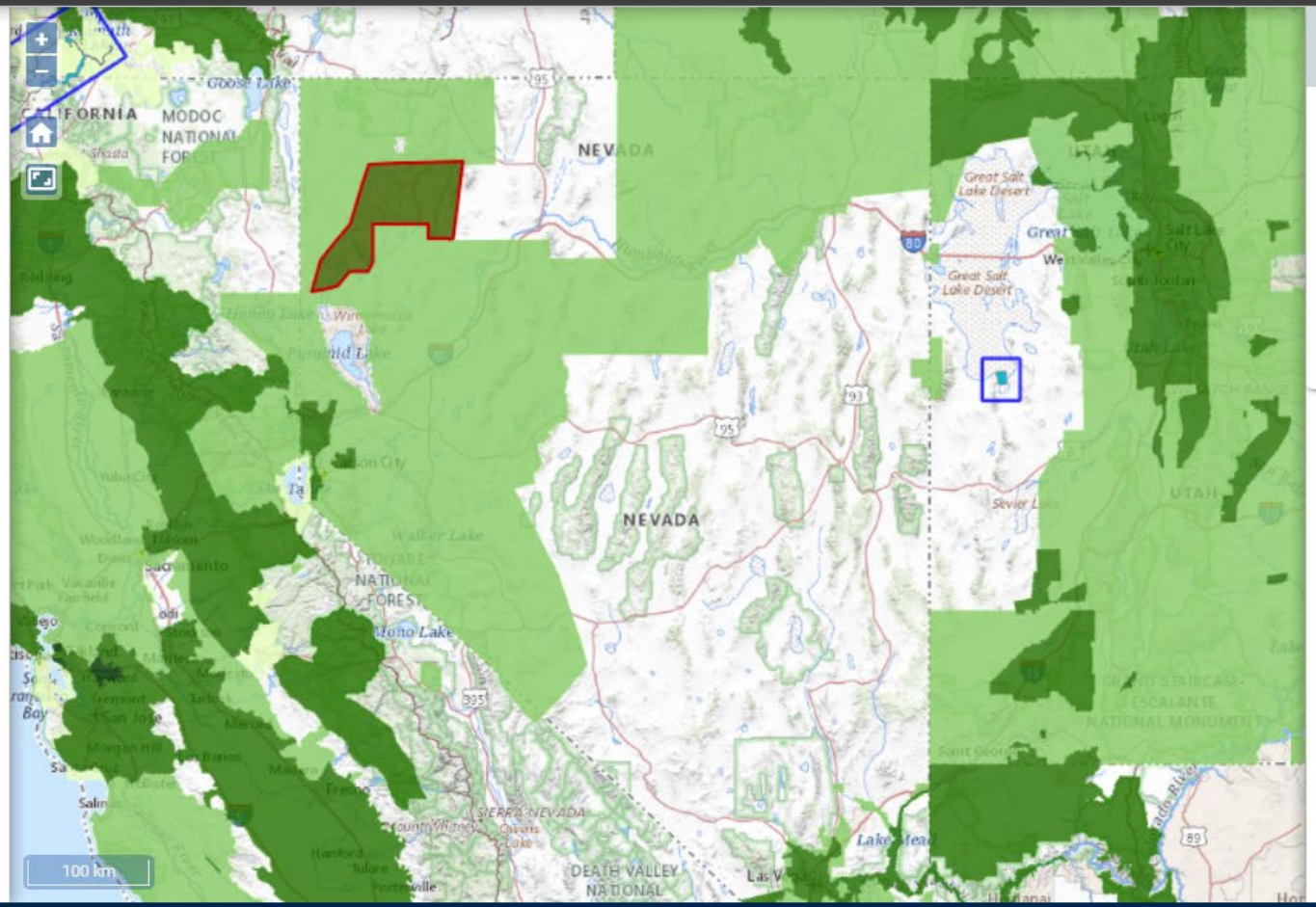
- [x] Show where Lidar is available.
- [x] Show Topobathy Lidar.

Click on the map to retrieve information about a lidar project.

Show options for filtering the lidar map display?

Show Legend More Info

- [ ] Define Area of Interest



Results

Selected Lidar Project(s)

- NV Humboldt 1 2021
- NV Humboldt 2 2021
- NV WestCentralEarthMRI 4 2020

To obtain a list of downloadable products, draw an Area of Interest (AOI) on the map by holding the Ctrl key down while dragging a box within the map or use the AOI widget.

LidarExplorer – Lidar Visualization

entwine

USGS science for a changing world

3DEP LidarExplorer

Search Process About LIDAR Type a lidar project name BASE MAP

Which product are you interested in?

LIDAR DEM OTHER

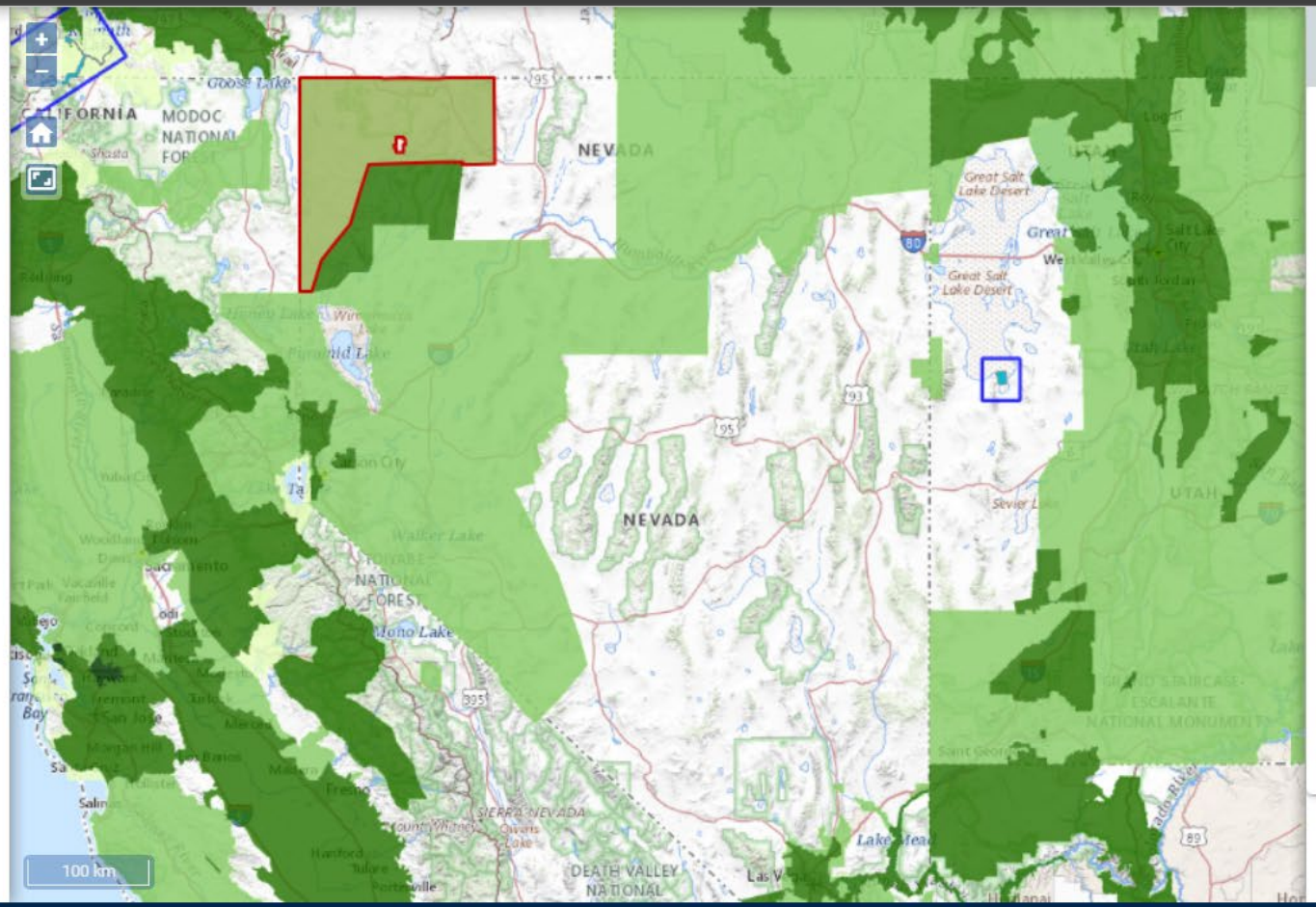
- [x] Show where Lidar is available.
- [x] Show Topobathy Lidar.

Click on the map to retrieve information about a lidar project.

Show options for filtering the lidar map display?

Show Legend More Info

- [ ] Define Area of Interest



Results

Selected Lidar Project(s)

NV Humboldt 2 2021

Quality:	QL 2
Published:	2024/02/14
Collected:	2021/09/12 - 2021/10/14
Source DEM:	1 meter
Links:	LPC | Source DEMs | Metadata
PMethod:	linear-mode lidar
Spec:	USGS Lidar Base Specification 2021 Revision A

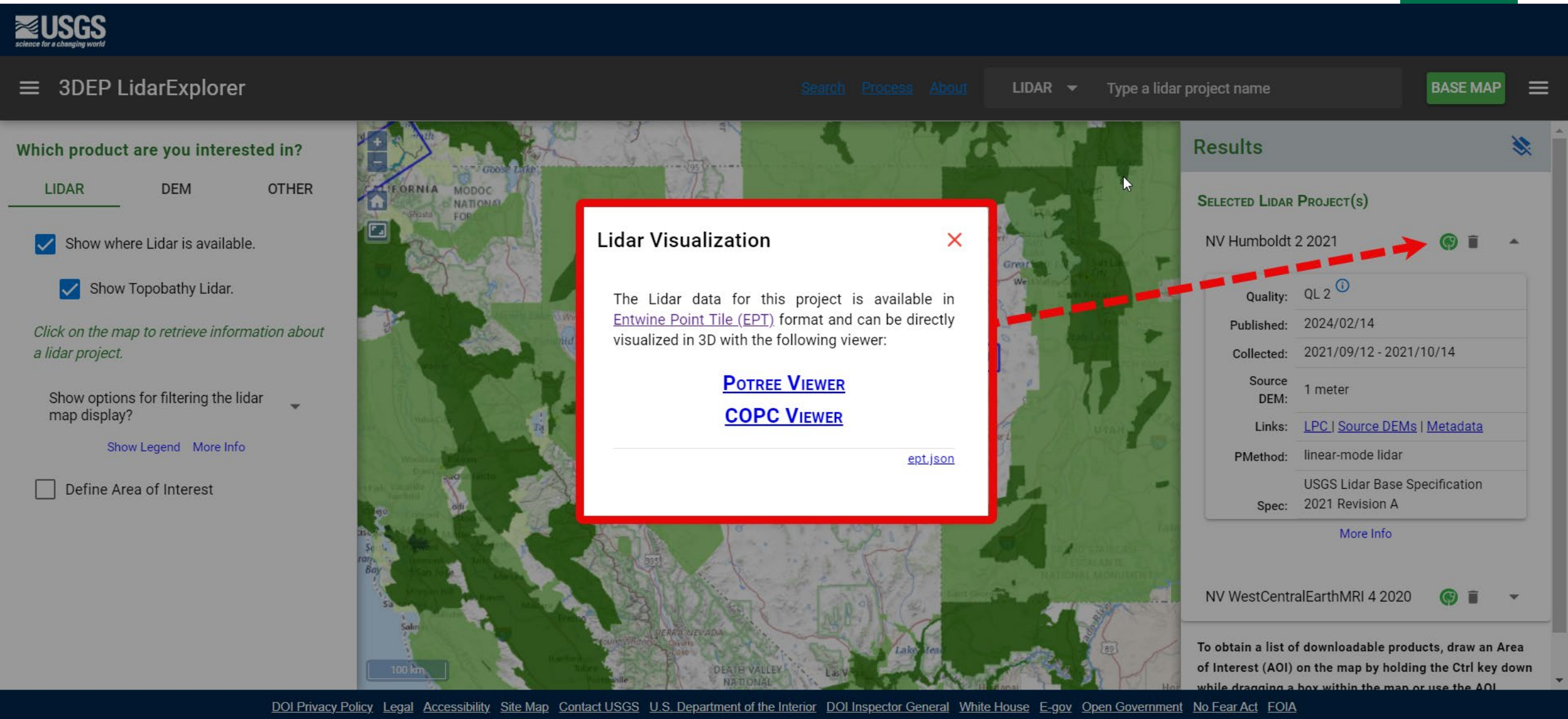
More Info

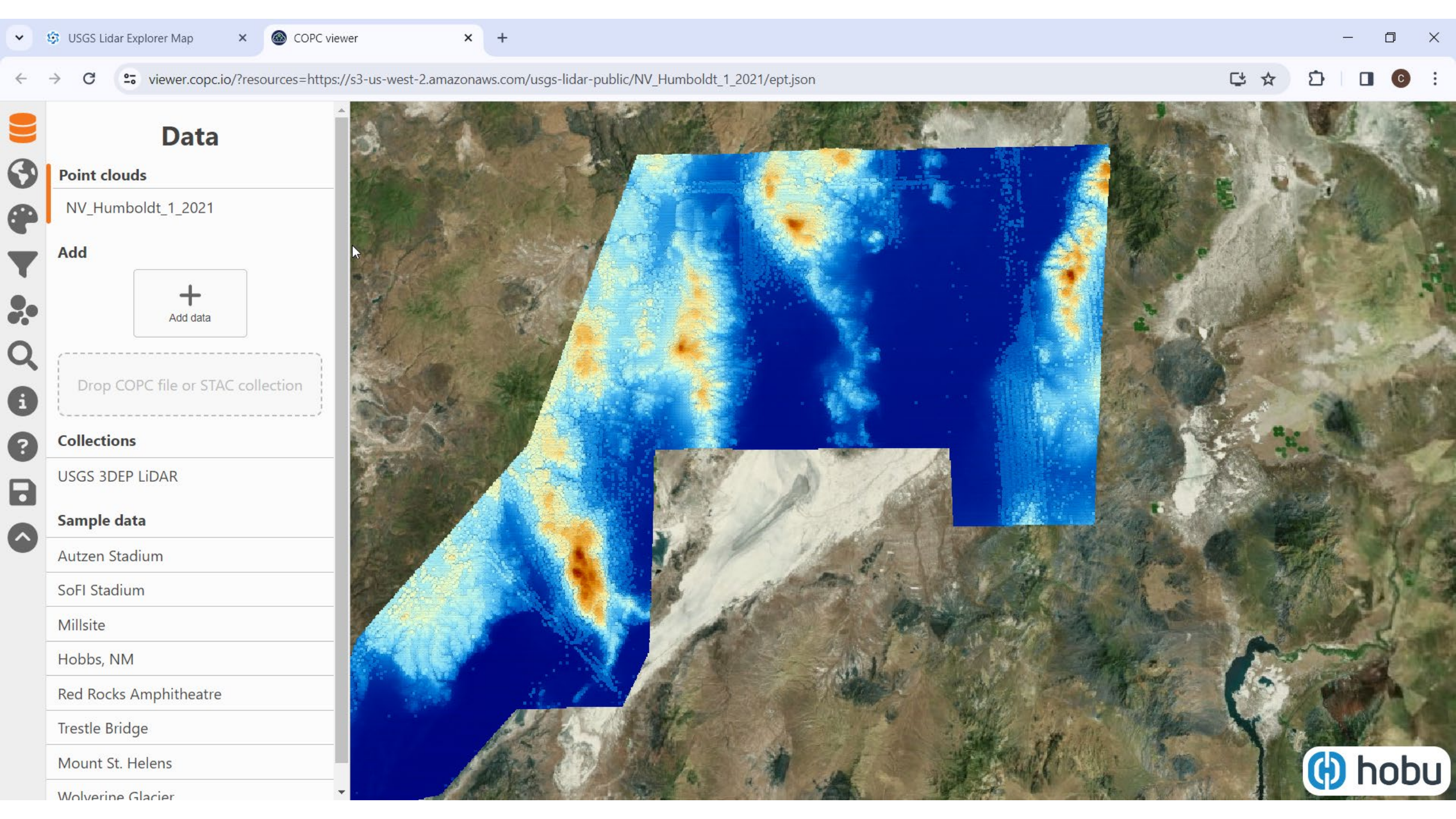
NV WestCentralEarthMRI 4 2020

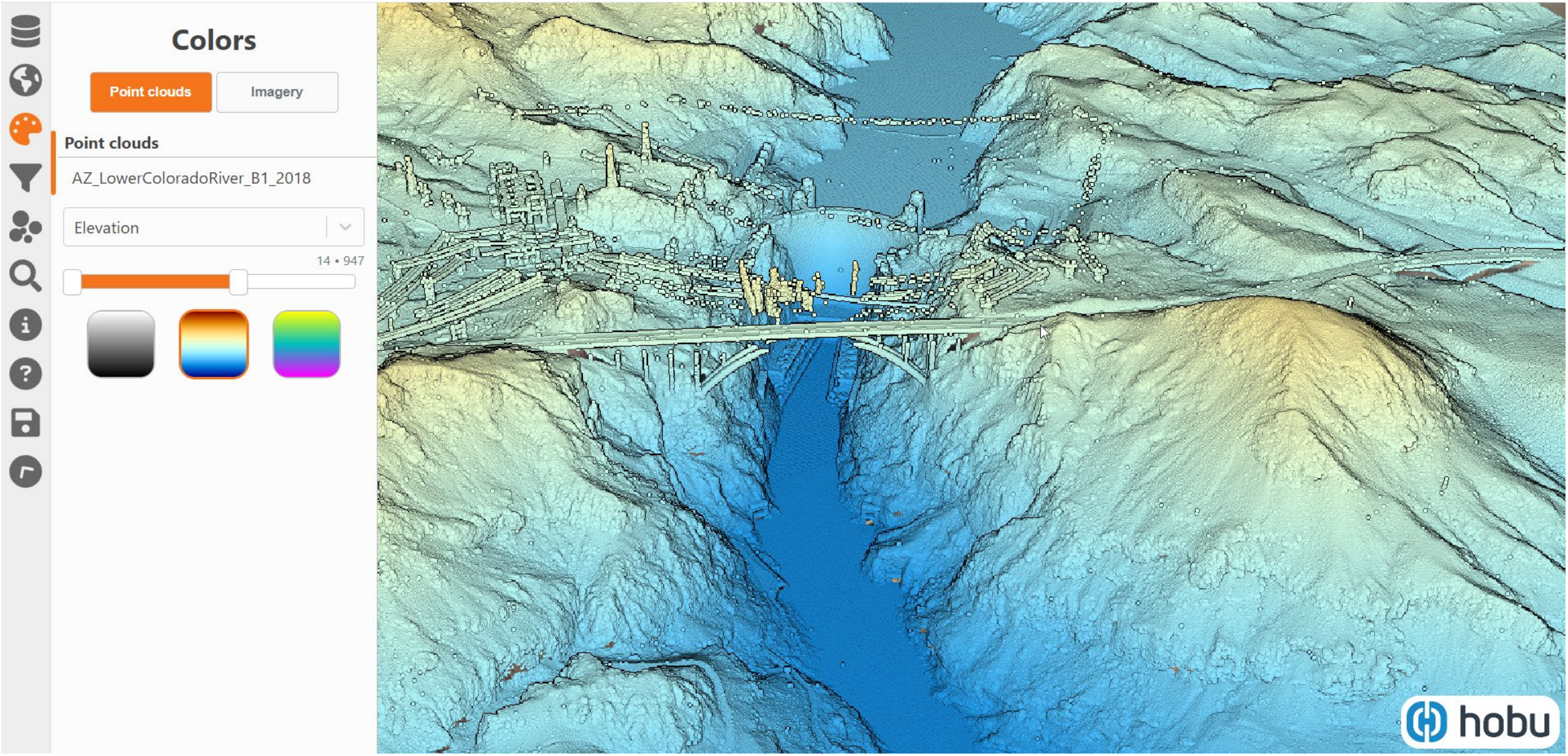
To obtain a list of downloadable products, draw an Area of Interest (AOI) on the map by holding the Ctrl key down while dragging a box within the map or use the AOI

DOI Privacy Policy Legal Accessibility Site Map Contact USGS U.S. Department of the Interior DOI Inspector General White House E-gov Open Government No Fear Act FOIA

Lidar Visualization




USGS Lidar Explorer Map
COPC viewer
viewer.copc.io/?resources=https://s3-us-west-2.amazonaws.com/usgs-lidar-public/NV_Humboldt_1_2021/ept.json
Data
Point clouds
NV_Humboldt_1_2021
Add
Add data
Drop COPC file or STAC collection
Collections
USGS 3DEP LiDAR
Sample data
Autzen Stadium
SoFI Stadium
Millsite
Hobbs, NM
Red Rocks Amphitheatre
Trestle Bridge
Mount St. Helens
Wolverine Glacier
hobu

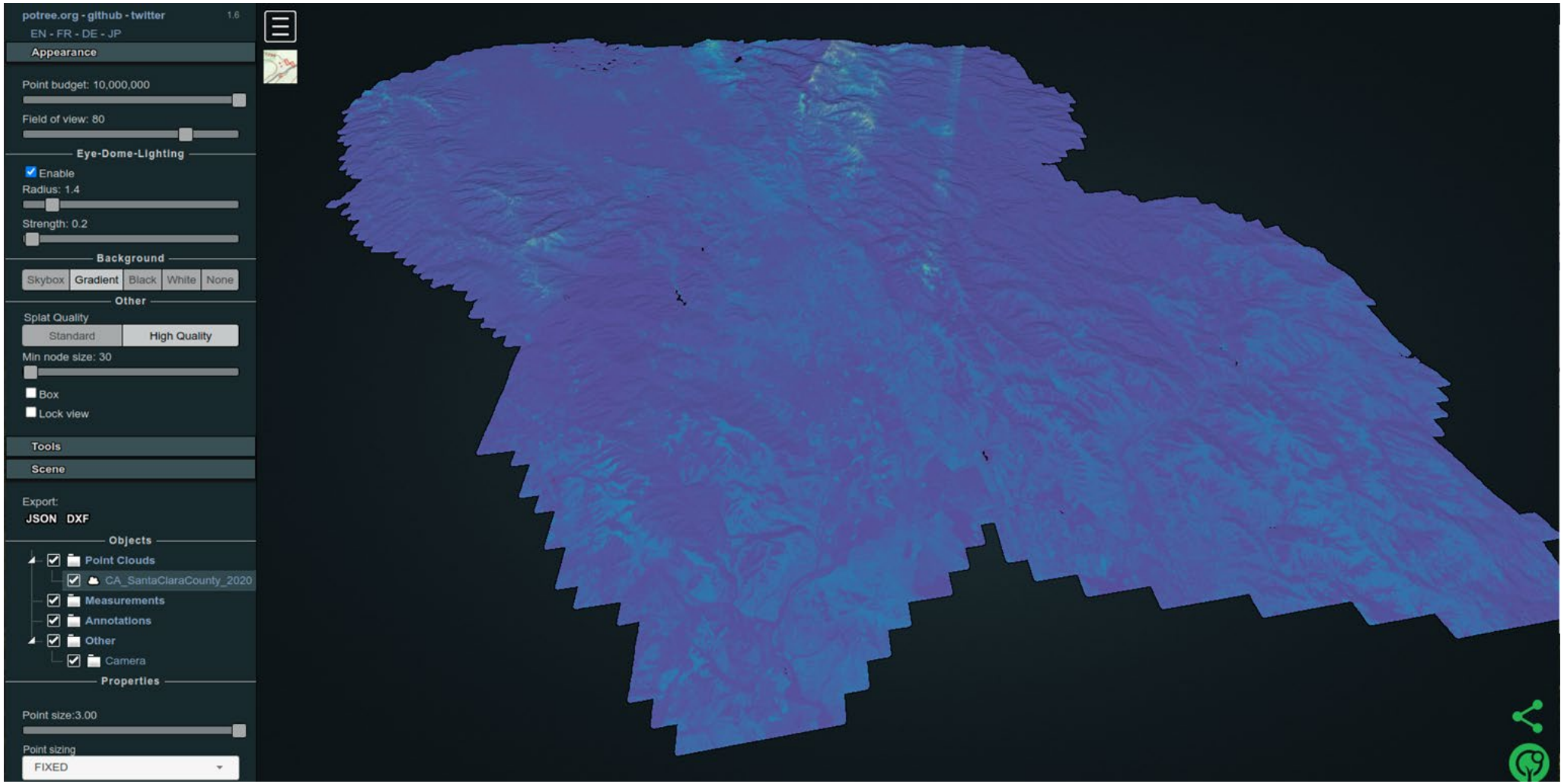


USGS science for a changing world

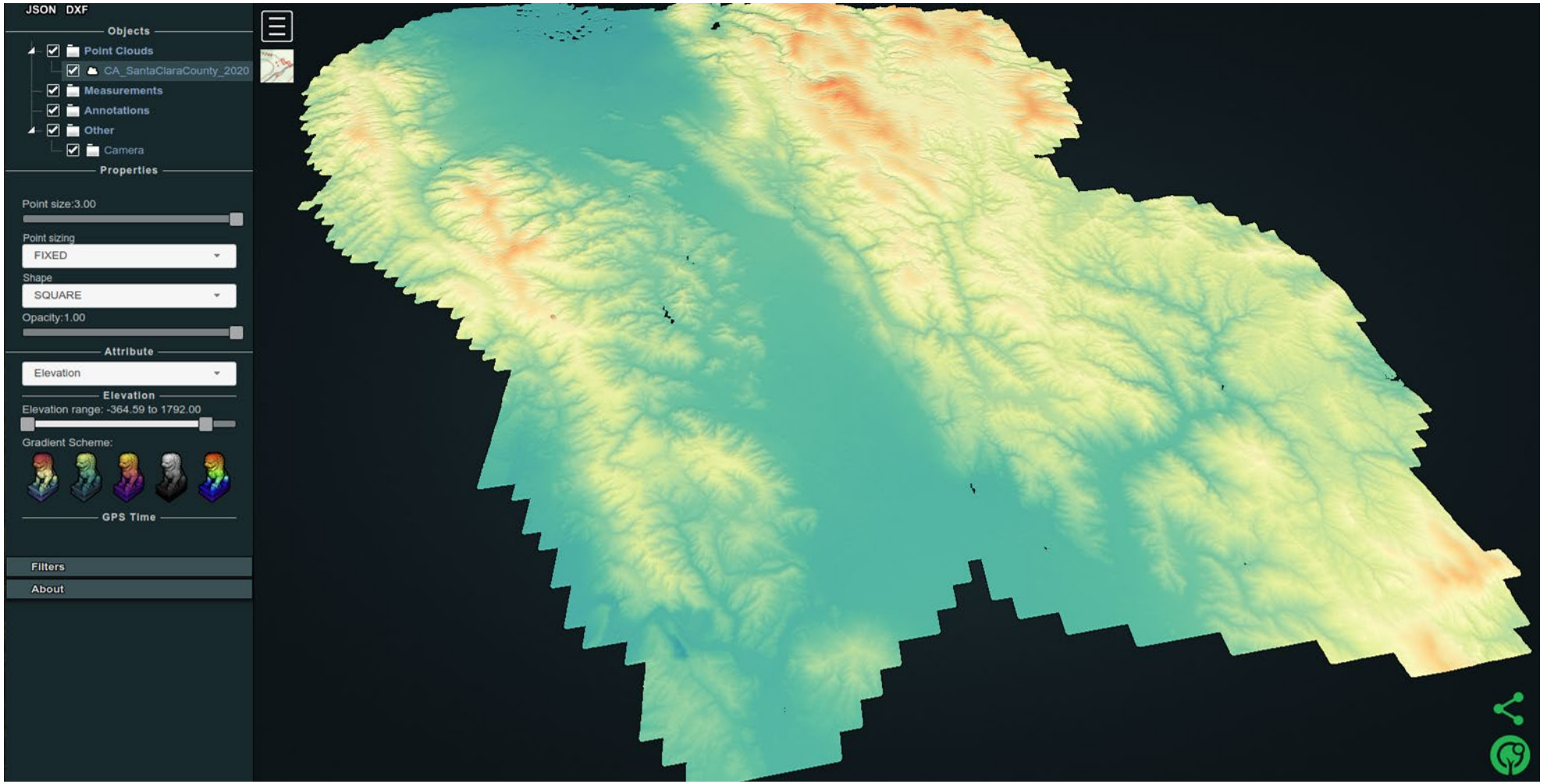
The National Map
Your Source for Topographic Information

[Hoover dam link example]

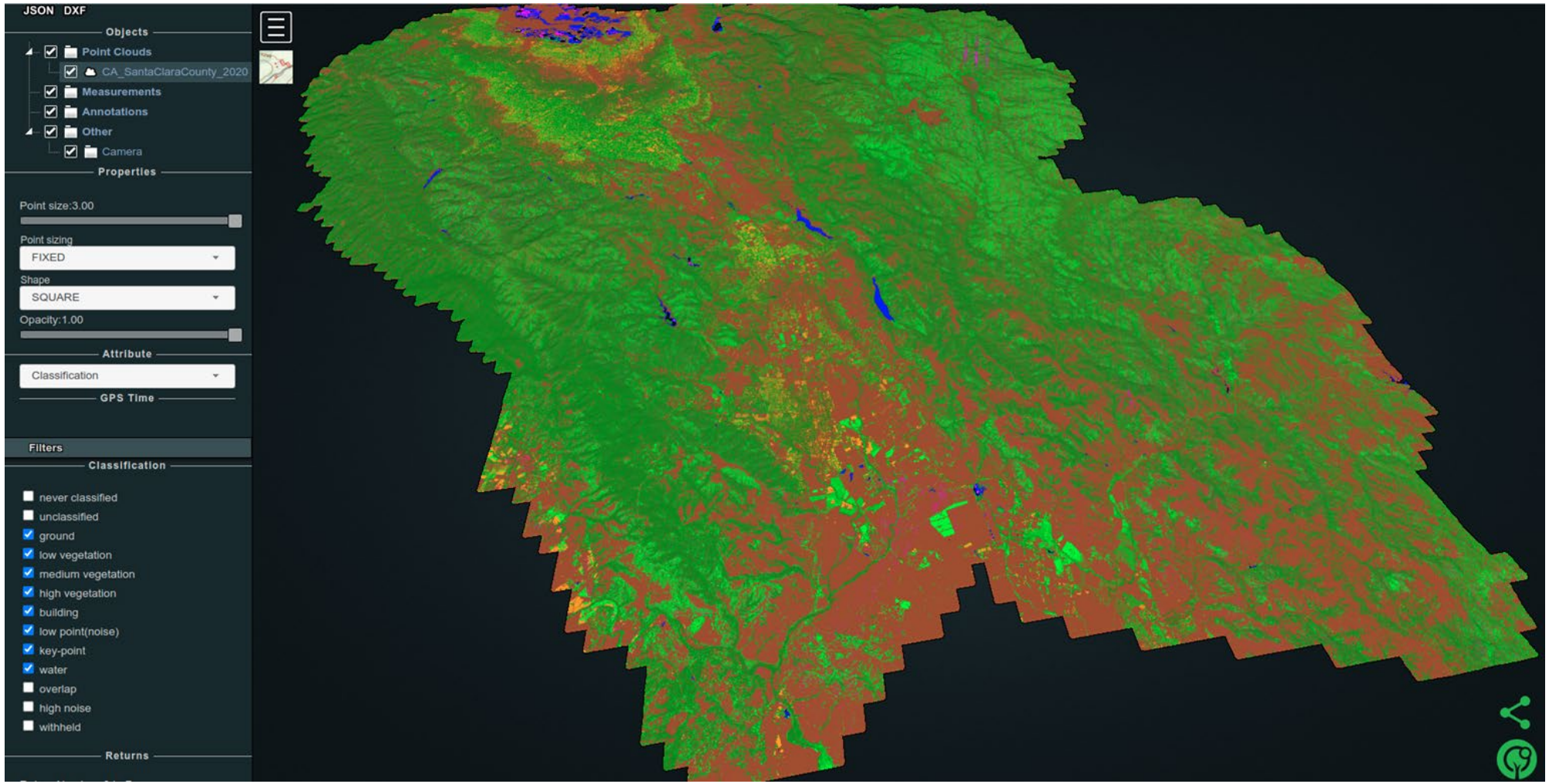
Potree - Intensity Gradient



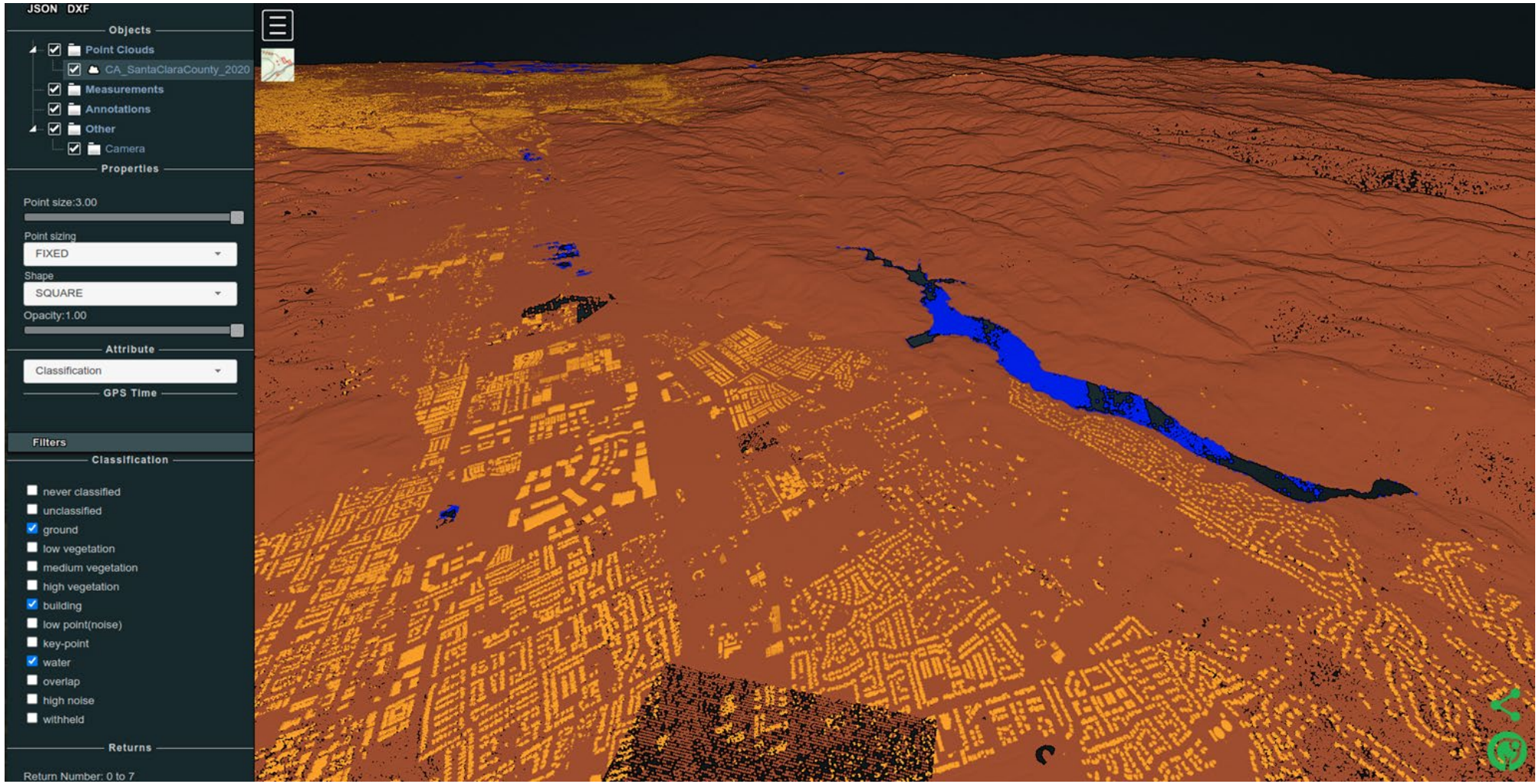
Potree - Elevation



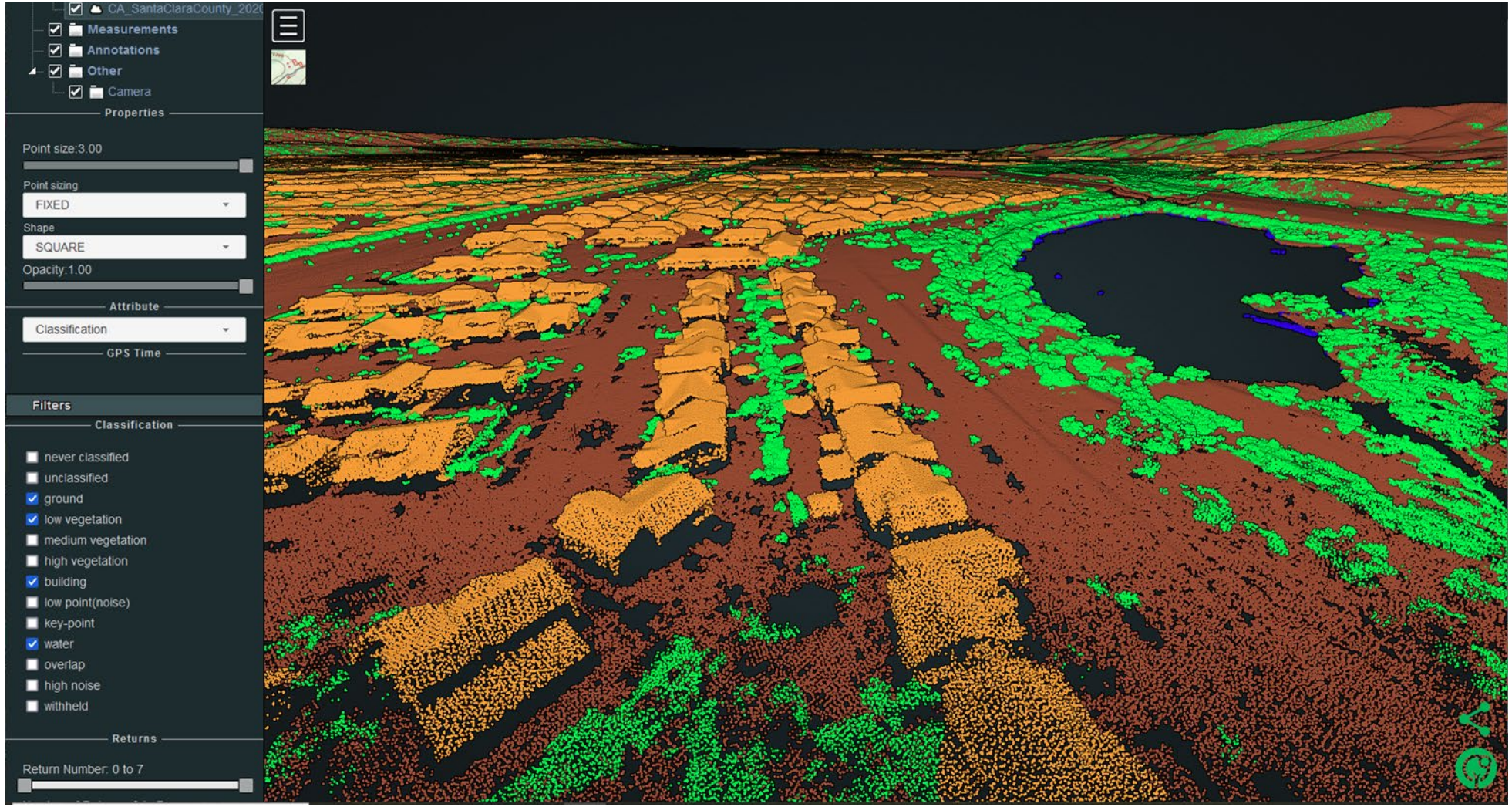
Potree - Classification



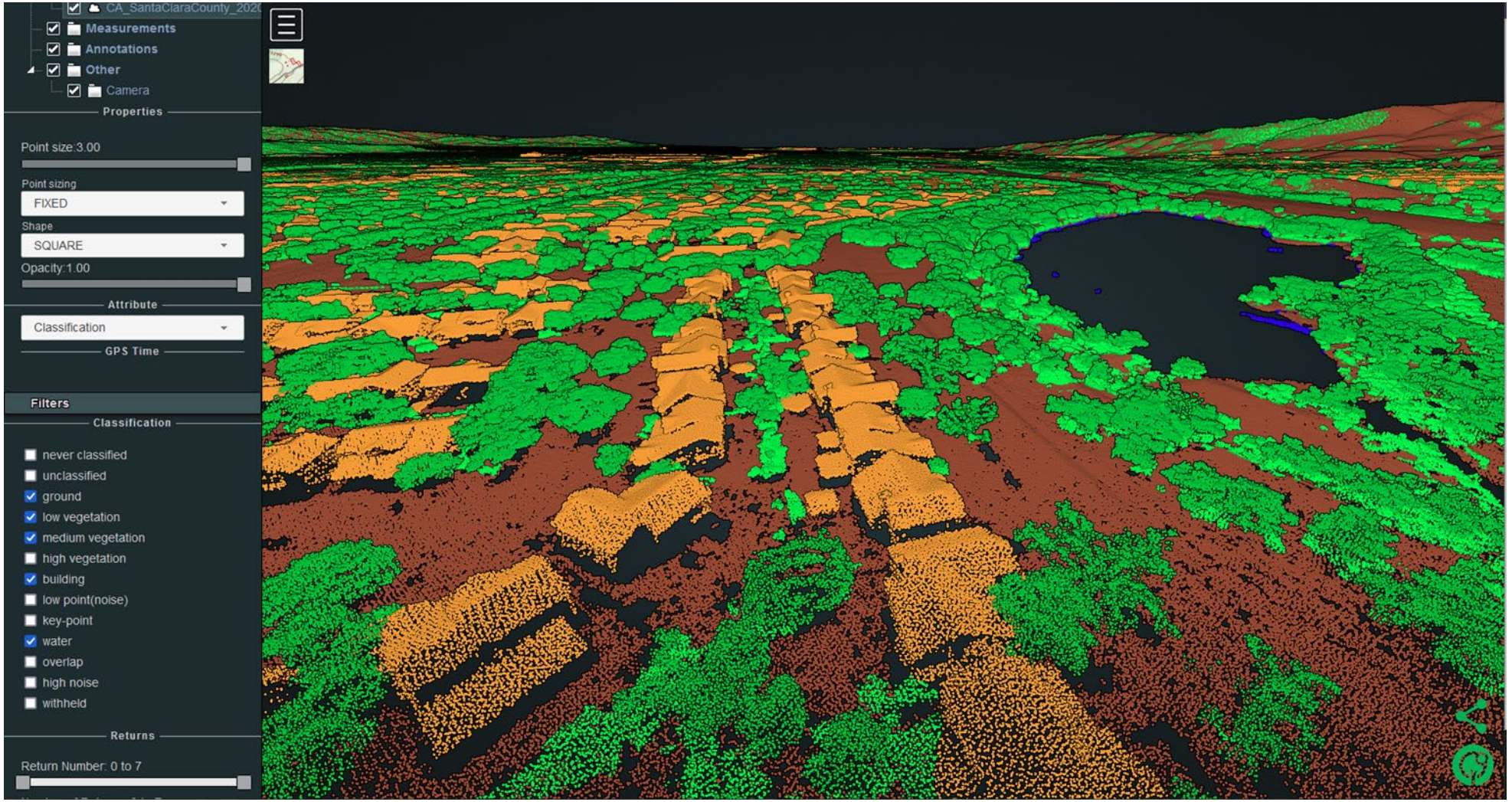
Potree - Filter by Classification



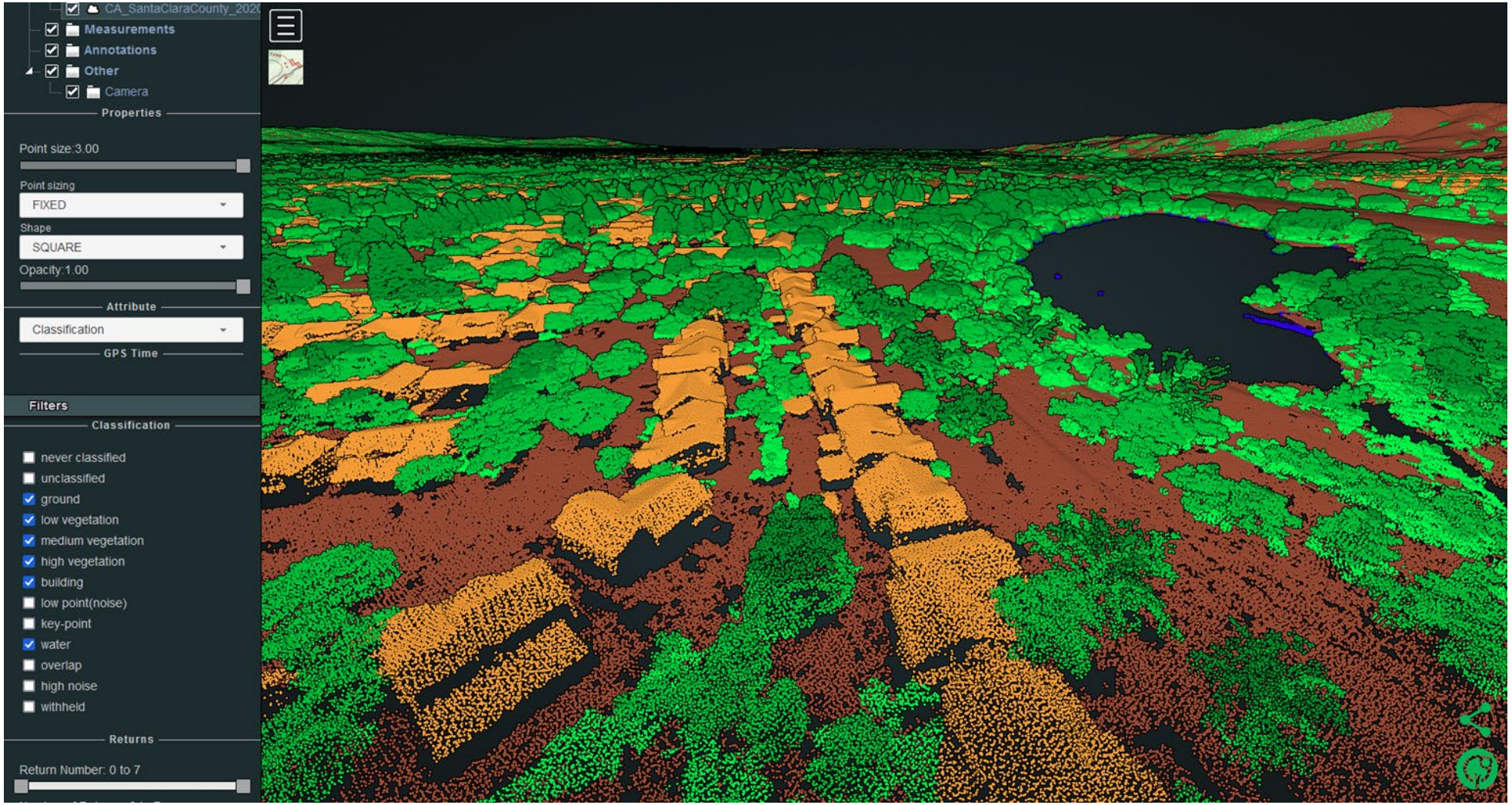
Potree - Filter by Classification



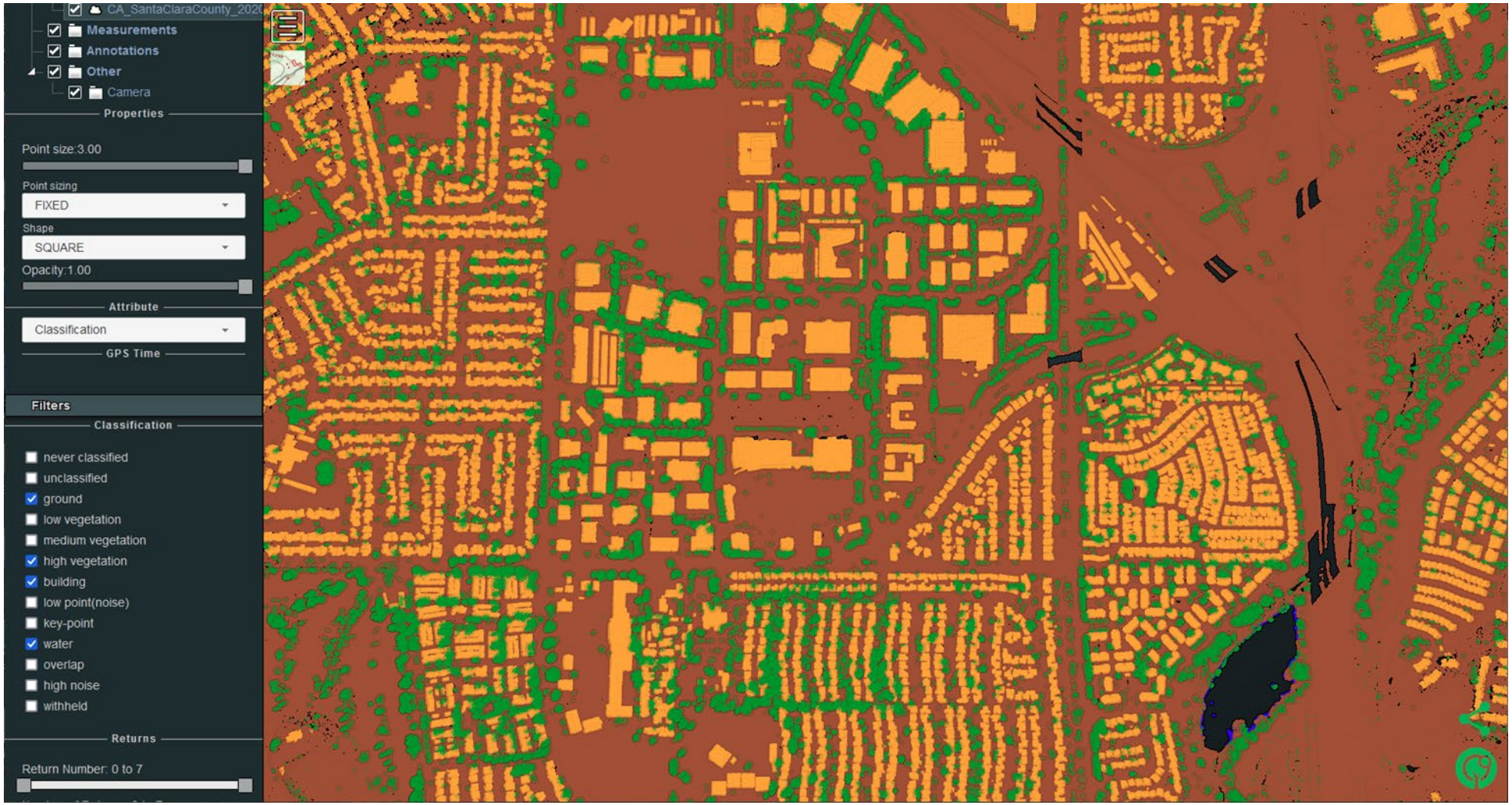
Potree - Filter by Classification



Potree - Filter by Classification



Potree - Filter by Classification



Combining Projects in Potree

USGS science for a changing world

The National Map
Your Source for Topographic Information

Nevada Combined Potree View

Other Nevada Examples with Entwine:

Lake Meade - Symbolized by Ground & Water Classifications

Lake Meade - Symbolized by Ground, Water, Low, Medium & High vegetation Classifications

Lake Meade - Symbolized by Elevation

Hoover Dam - Symbolized by Ground & Water Classifications

Hoover Dam - Symbolized by Ground, Water, & Unclassified Classifications

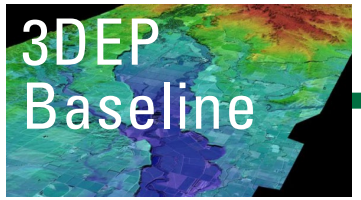
Hover Dam - Symbolized by Return Count 1

Hover Dam - Symbolized by Return Count 1 & 2

Hover Dam - Symbolized by Scan Angle

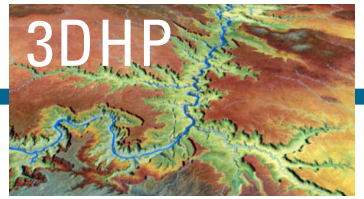
3D National Topography Model

Progression required to produce a fully integrated and continuous topographic model to meet the Nation's critical applications



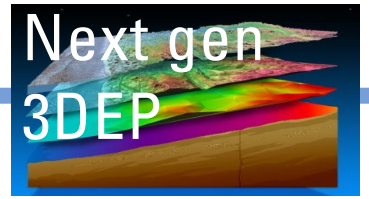
Complete the nationwide 3D Elevation Program (3DEP) baseline

94% of the Nation has 3DEP baseline data available or in progress



Use the 3DEP baseline to derive the 3D Hydrography Program (3DHP)

First full year of implementation in FY24



Implement the next generation of 3DEP to multiply value and improve applications

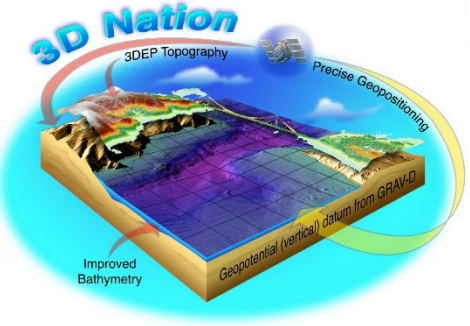
First full year of implementation in FY27 depending on funding

Research and develop a 3D data model to fully integrate 3DEP, 3DHP, and other data

Early development stage

3D National Topography Model (3DNTM)

The terrestrial component of the 3D Nation vision of a continuous data surface from the depths of the oceans to the peaks of the mountains



Underpins a broad range of applications including flood risk management, drought management, hazards response and mitigation, infrastructure management, climate change science, and more

Provides universal sharing of water information as the geospatial foundation for the Internet of Water

Provides a federated system of shared elevation resources

Enables new and emerging applications

- Multiple vintages enable change detection
- Water-related applications move from the neighborhood to the street-level in accuracy

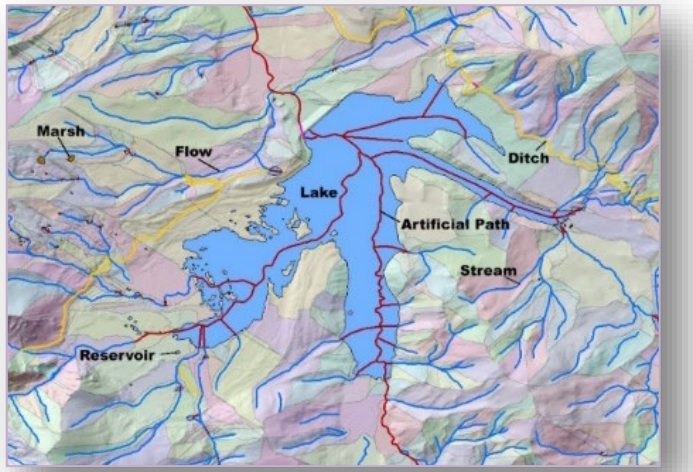
Provides foundational data to critical initiatives

- Future of Flood Risk Data and Risk Rating 2.0
- The National Water Model
- The Clean Water Act
- The Earth Mapping Resources Initiative and critical minerals
- National Landslides Preparedness Act

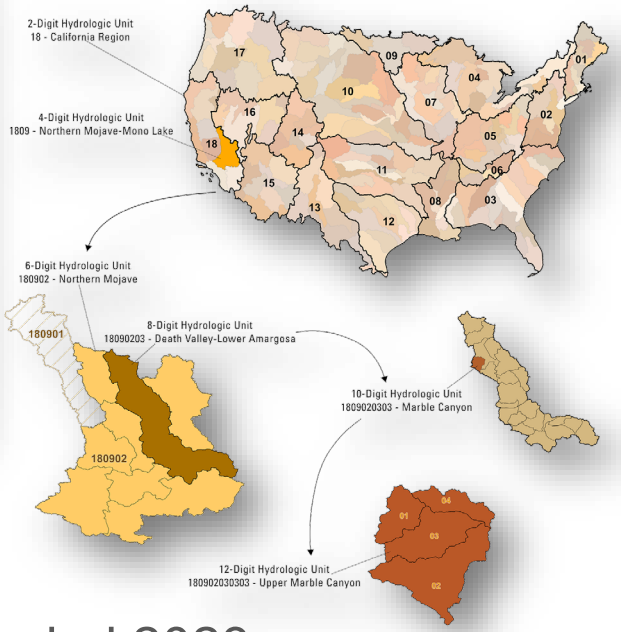
usgs.gov/3DNTM

Moving toward 3DHP

National Hydrography Dataset (NHD)

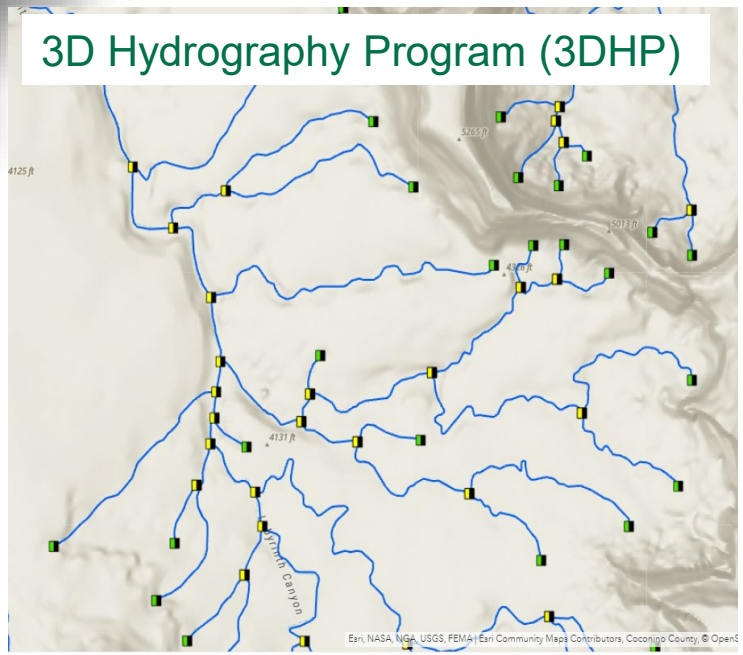


Watershed Boundary Dataset (WBD)



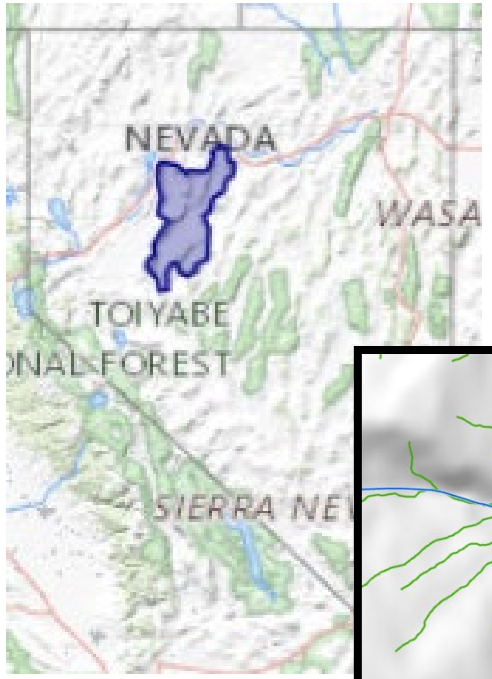
NHDPlus High Resolution (NHDPlus HR)

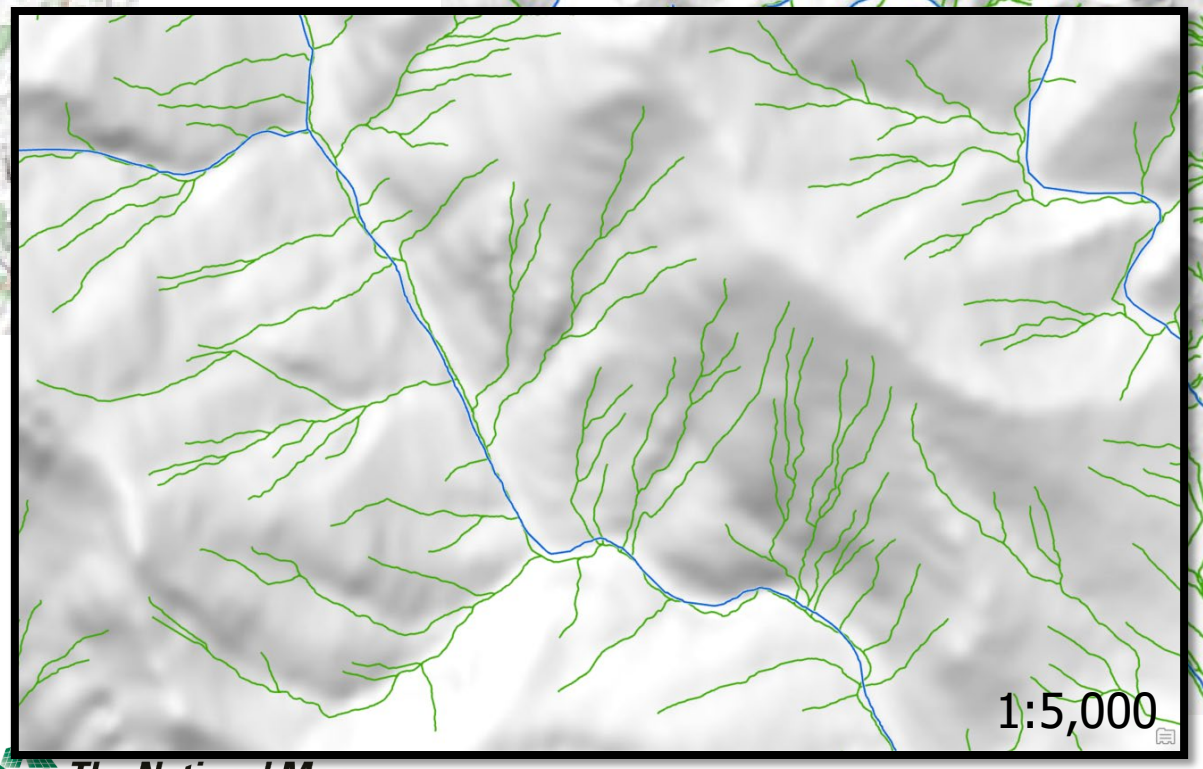
3D Hydrography Program (3DHP)



- Editing on NHD and WBD ended 2023
- Final version of WBD in work
- Static versions of NHD and NHDPlus are available and can be found https://apps.nationalmap.gov/downloader/NHD/DataAccess or viewer.nationalmap.gov/services

NV pilot EDH project

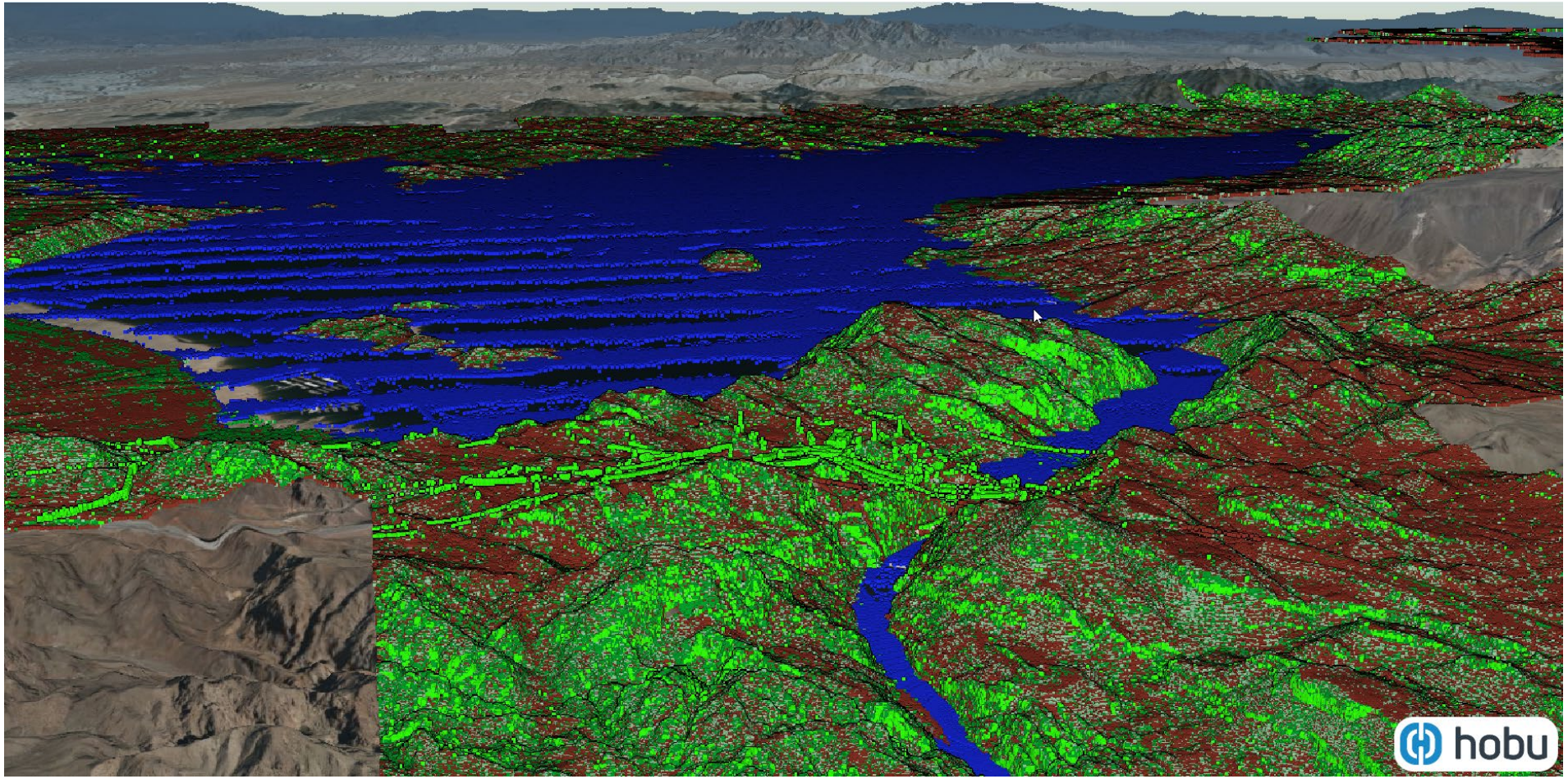




Reference Links

- General National Map questions: TNM_help@usgs.gov
- The National Map Video page usgs.gov/NGPvideos
- Download page usgs.gov/NationalMap/data-download
- Service List usgs.gov/NationalMap/services
- National Map Liaison Contact Info: https://www.usgs.gov/NGPConnect
- Kirk Waters with NOAA wrote a great blog post about Entwine Point Tiles https://geozoneblog.wordpress.com/2021/09/29/new-ways-to-access-lidar/

Thank You!



Cynthia Ritmiller
critmiller@usgs.gov
303– 202- 4550

Drew Decker
ddecker@usgs.gov
619-202-6430

USGS science for a changing world

The National Map
Your Source for Topographic Information