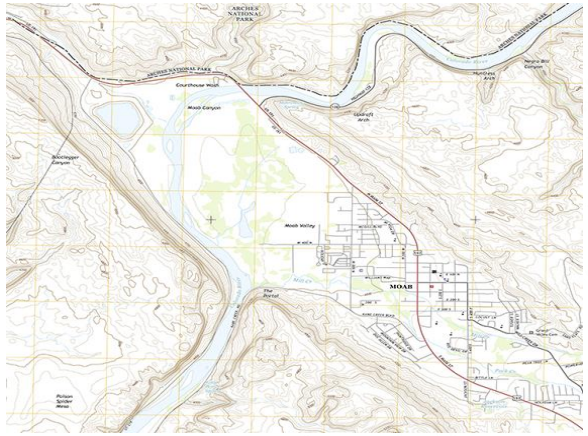
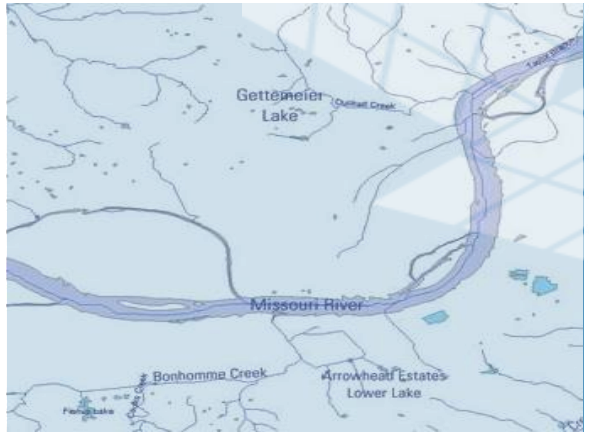
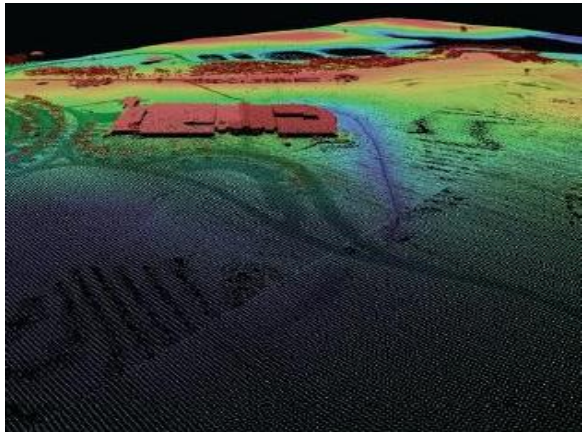
The National Map (TNM) – Your Source for Topographic Information







Fort Bend GIS Consortium Meeting
February 13, 2025
Michelle Fischer – National Map Liaison for AR, LA, OK, and TX

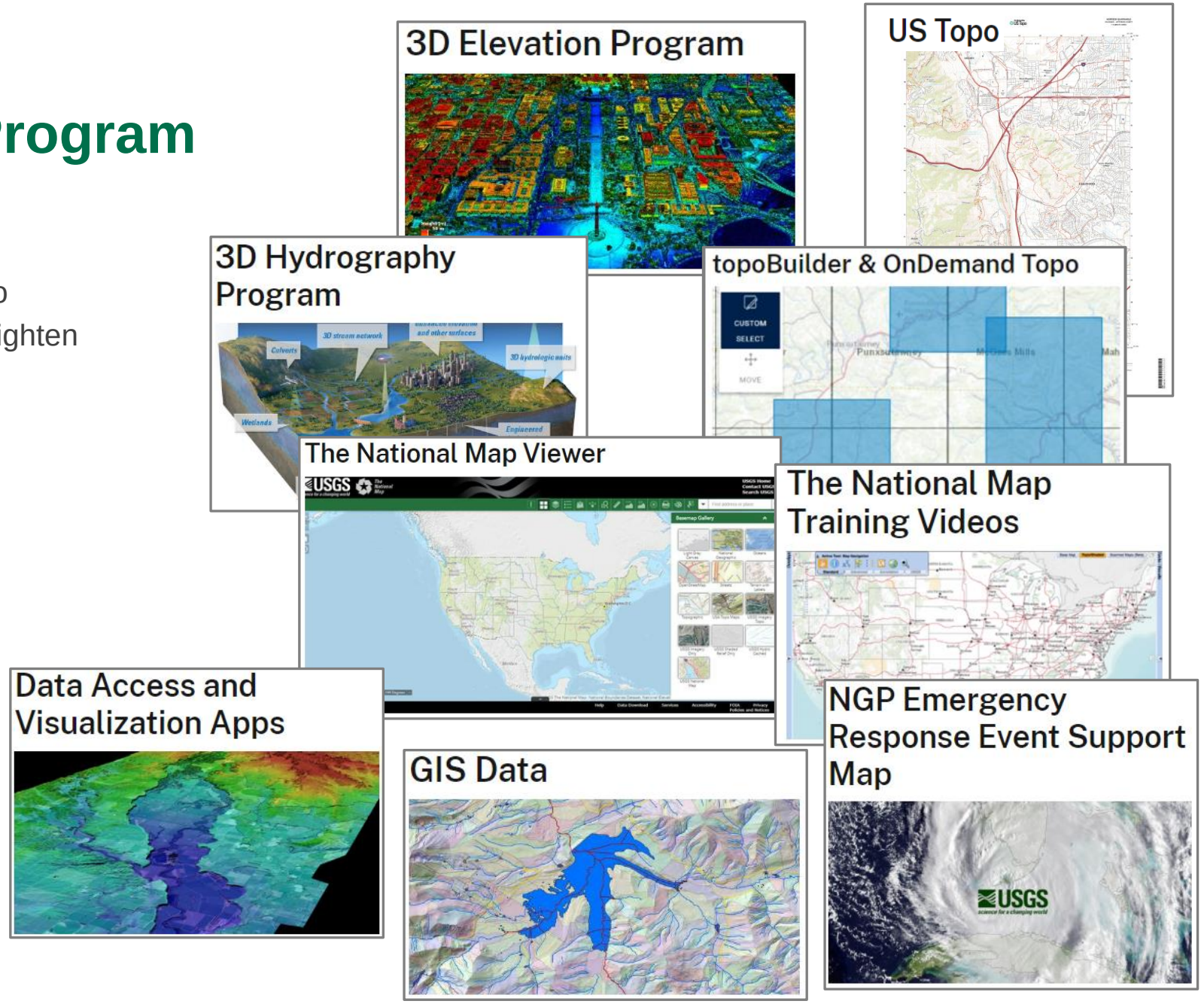
USGS The National Map
Your Source for Topographic Information

USGS
National Geospatial Program

Mission

Provide National topographic information to advance science, support government, enlighten citizens, and enable decision making.

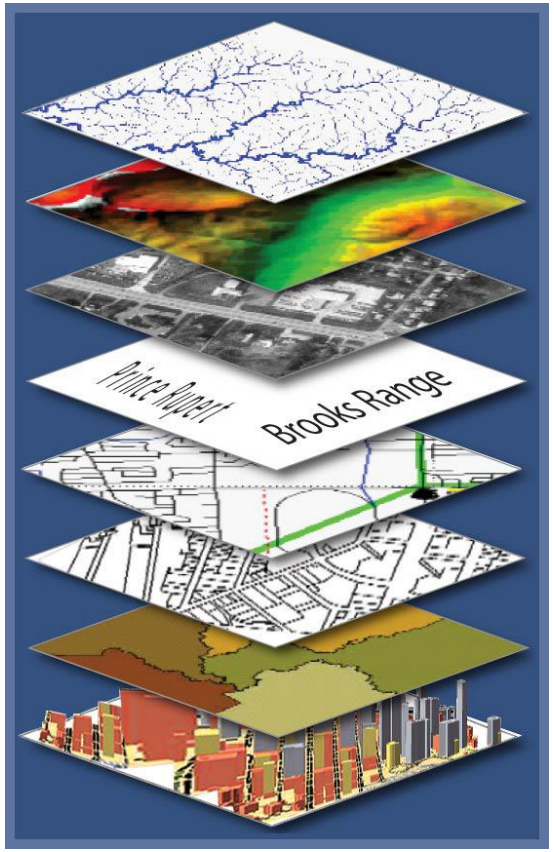
Authoritative
Accessible
Available
Accurate



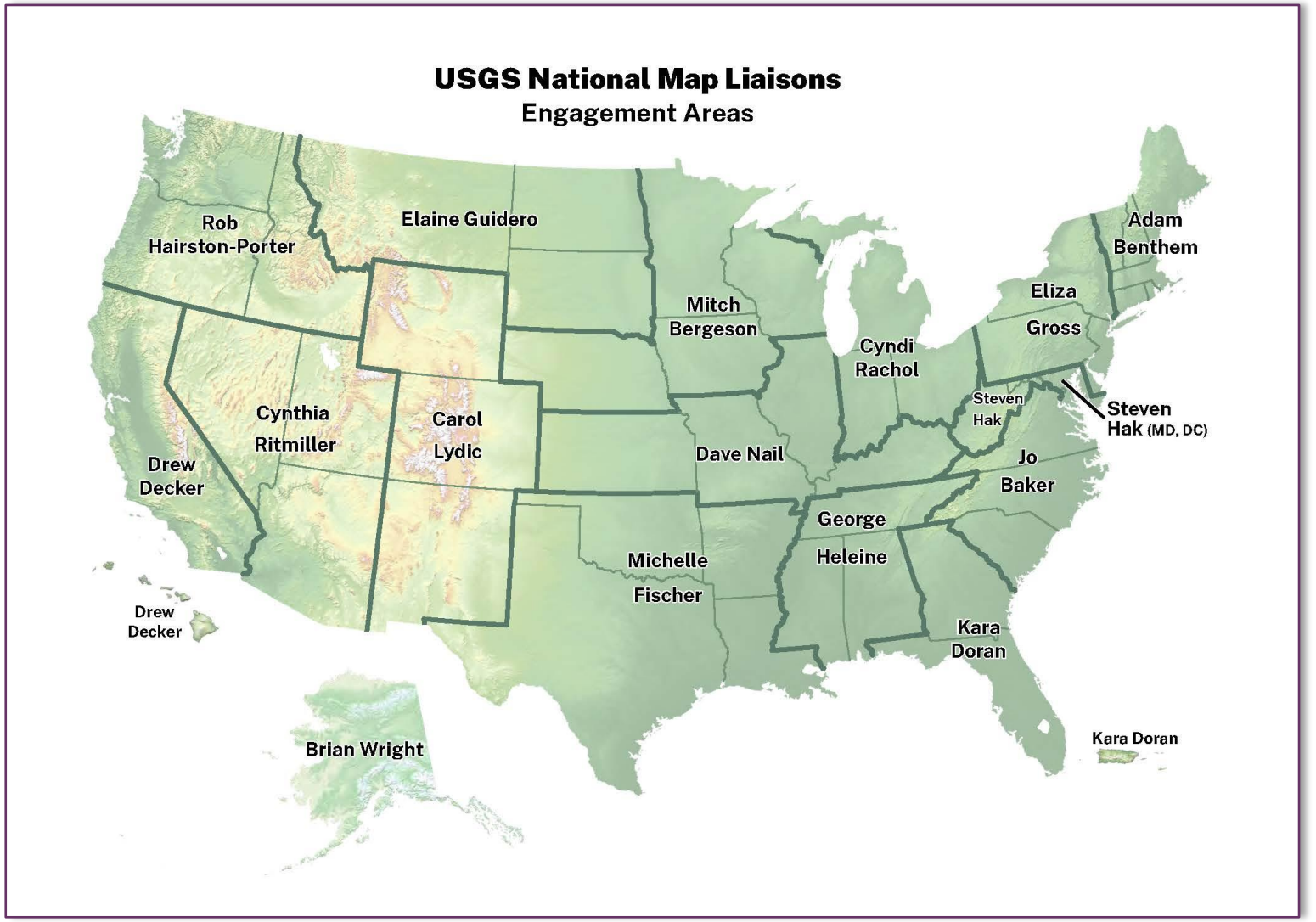
USGS The National Map
Your Source for Topographic Information

The National Map

- *The National Map* includes eight foundational data layers: **hydrography**, **elevation**, orthoimagery, **geographic names**, boundaries, transportation, structures, land cover
  - Public domain data to support
    - USGS topographic maps at 1:24,000-scale
    - Products and services at multiple scales and resolutions
    - Analysis, modeling and other applications at multiple scales and resolutions
  - *The National Map* is built on partnerships and standards
  - Resource focus is on building and maintaining data; automating creation of derived products and services



The National Map Liaisons



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Geospatial Information Response Team

usgs.gov/GIRT

Fires

Floods

Hurricanes

Landslides

Volcanoes

Earthquakes

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GIRT EVENT SUPPORT MAP HUB SITE

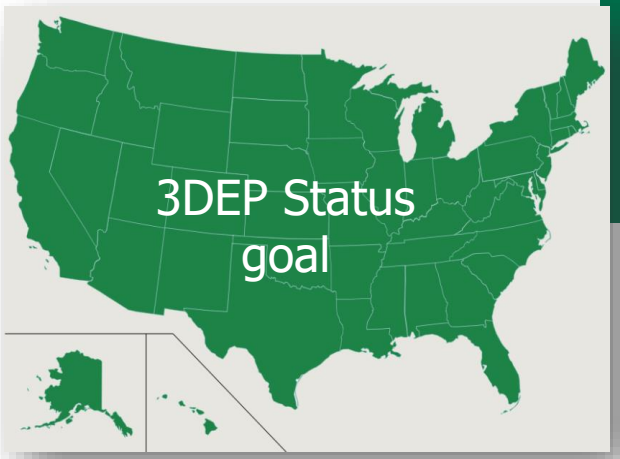
USGS The National Map
Your Source for Topographic Information

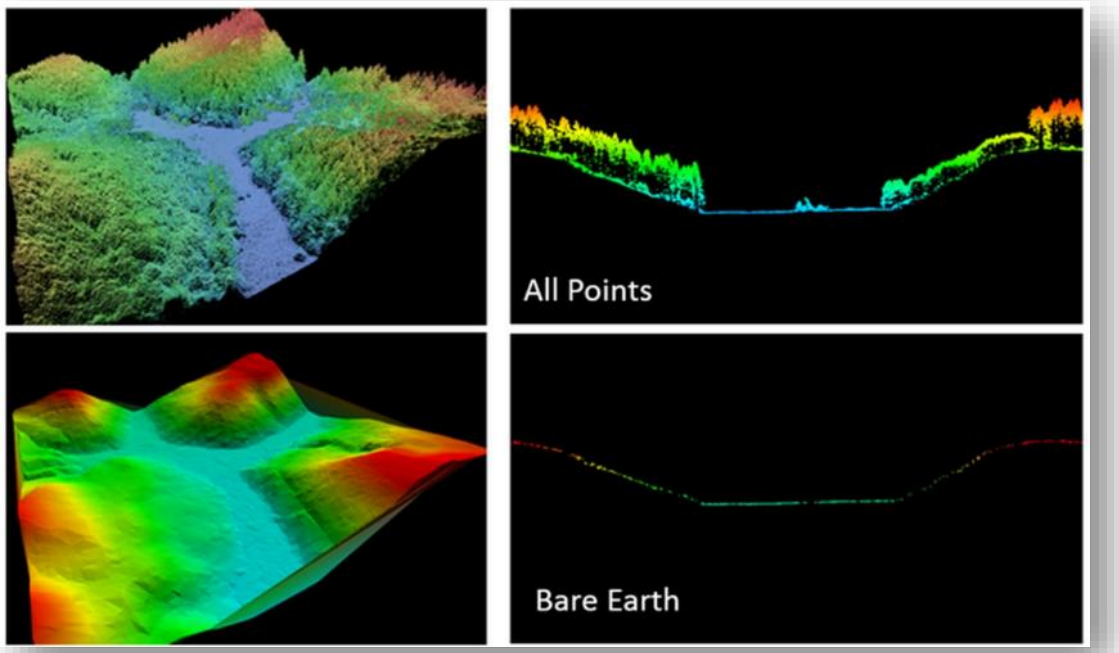
apps.nationalmap.gov/event-support-map-hub

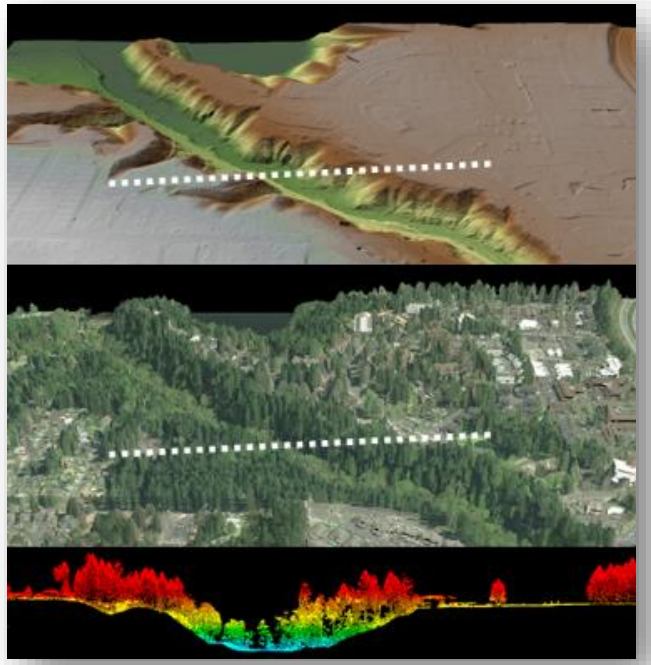
Topographic Data

3D Elevation Program (3DEP) Goal

- 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







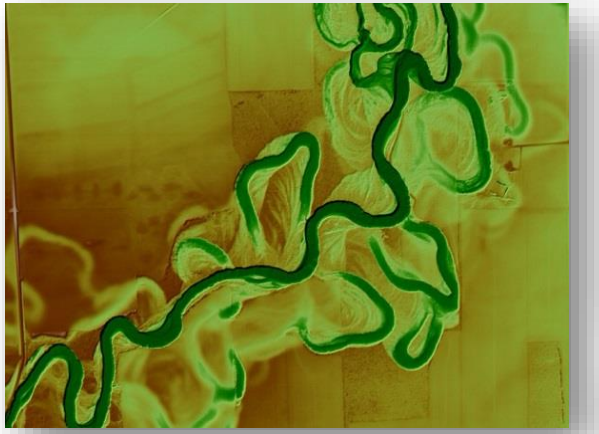
Bare earth DEM

Lidar point cloud (colorized by aerial photo)

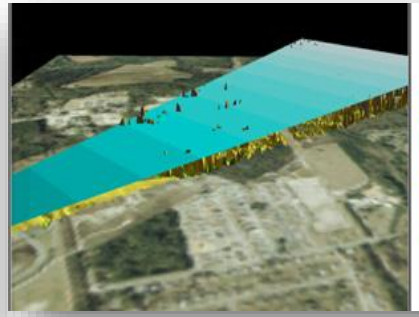
Lidar profile

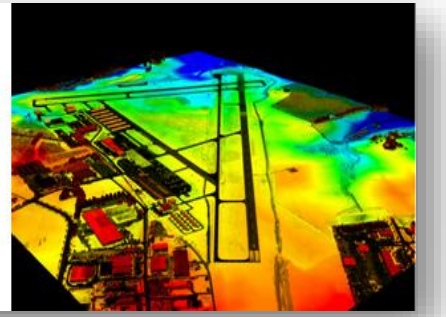
3D Elevation Program (3DEP)

Mission Critical Applications

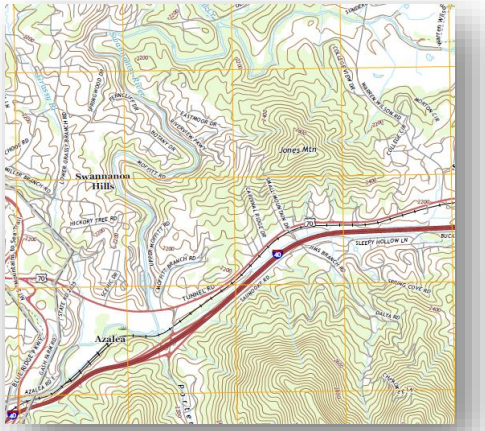


Flood Risk Management

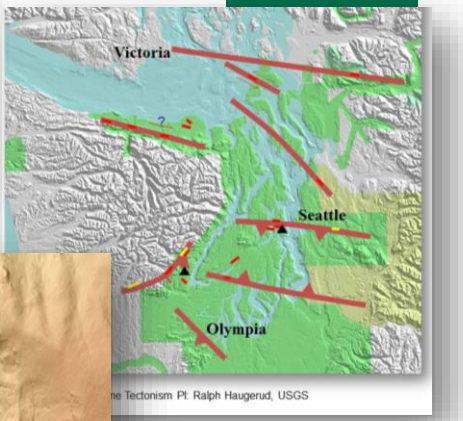


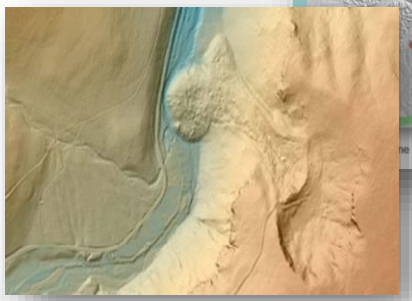


Aviation Safety

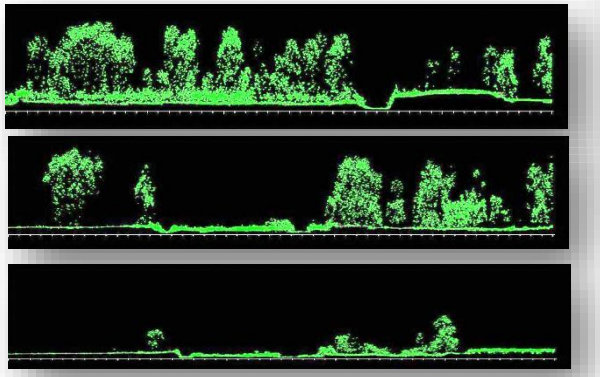


US Topo Contours

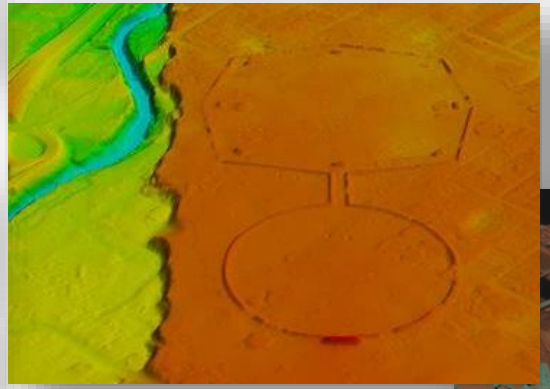




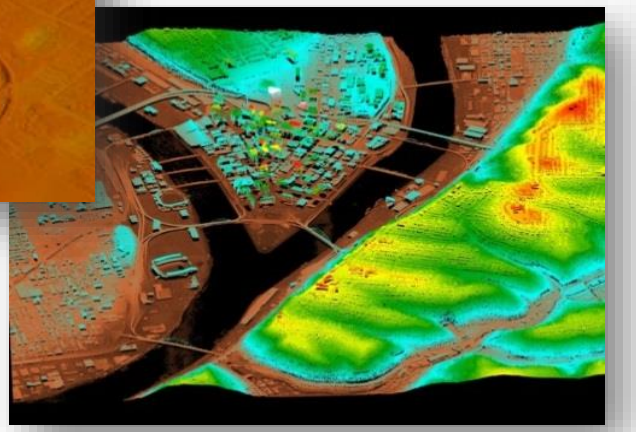
Geologic Hazards



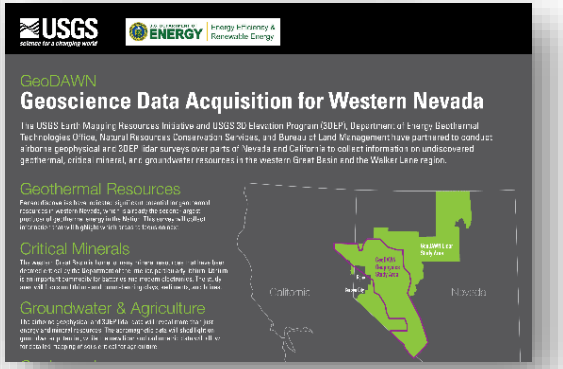
Precision Forestry



Archaeology



Infrastructure Management

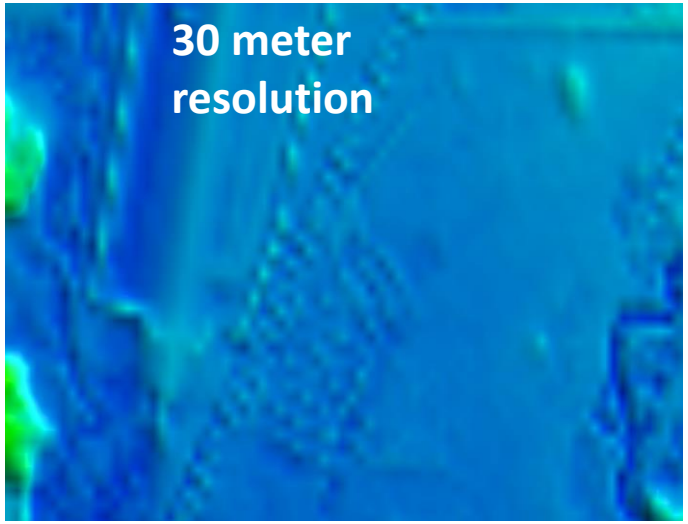


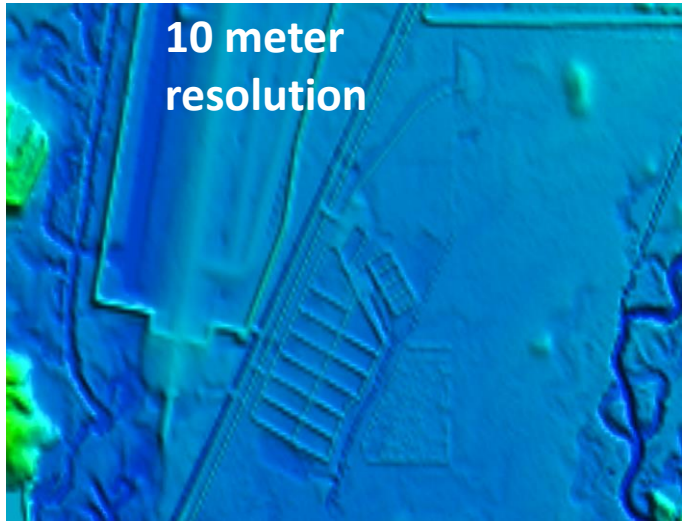
Alternative Energy

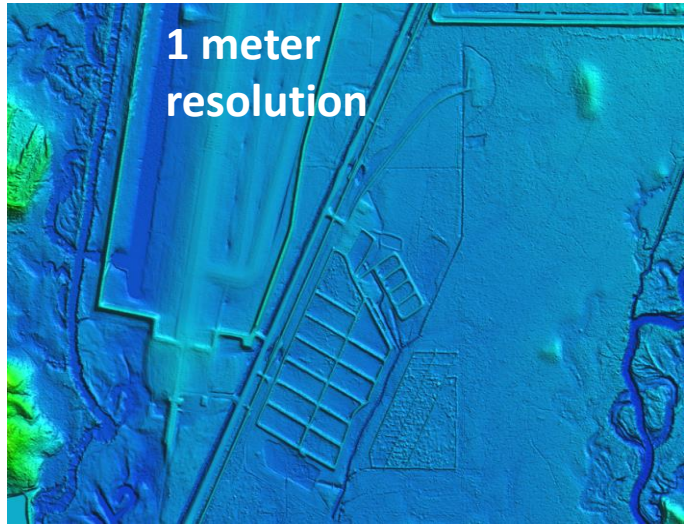
USGS The National Map
Your Source for Topographic Information

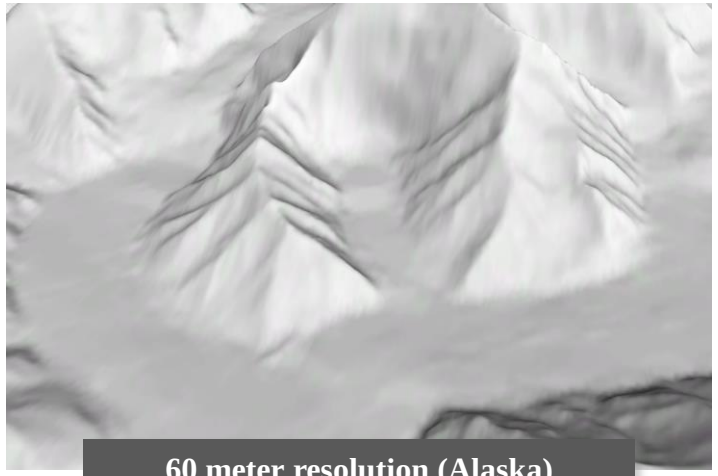
3DEP Data Quality

Improves and Enables Applications

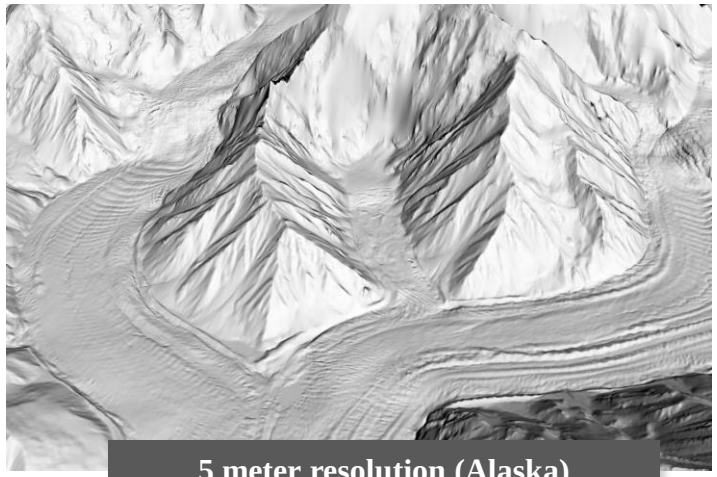








60 meter resolution (Alaska)



5 meter resolution (Alaska)

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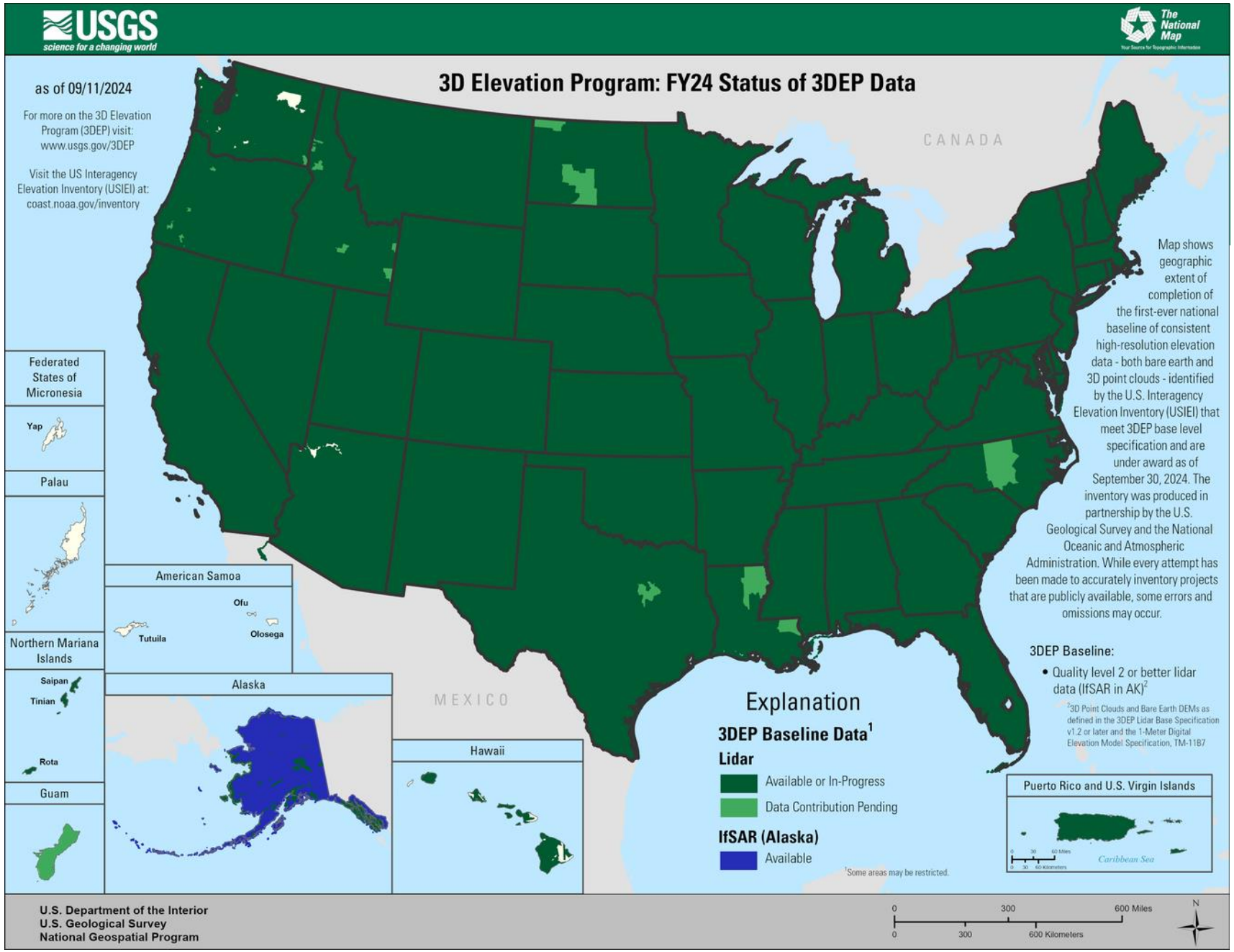
3DEP Status

usgs.gov/3DEP



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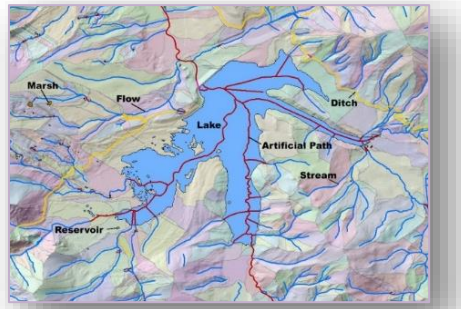
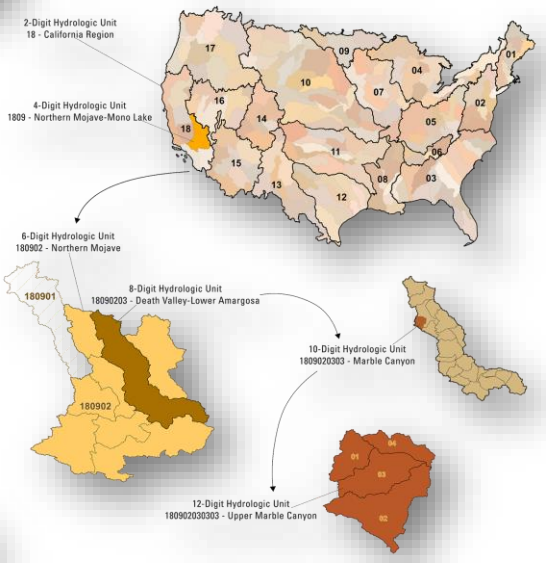
Previous Approach to National Hydrography Datasets

- The National Hydrography Dataset (NHD) portfolio of datasets is the most comprehensive and current data of the Nation's surface waters
  - 9.4 million miles stream of network, including 8 million waterbodies and over 130,000 nested hydrologic units
  - Based on 1:24,000-scale maps
- NHD and Watershed Boundary Dataset (WBD) leverage local knowledge and updates through a stewardship program with participants from 41 states and Washington DC
- Updates are not uniform
  - Some areas have been updated; others untouched and based on older information – sometimes 40+ years old
  - National consistency of data quality has decreased over time
  - NHD surface water features don't align well with highly accurate 3D Elevation Program data



National Hydrography Dataset



Watershed Boundary Dataset

NHDPlus High Resolution

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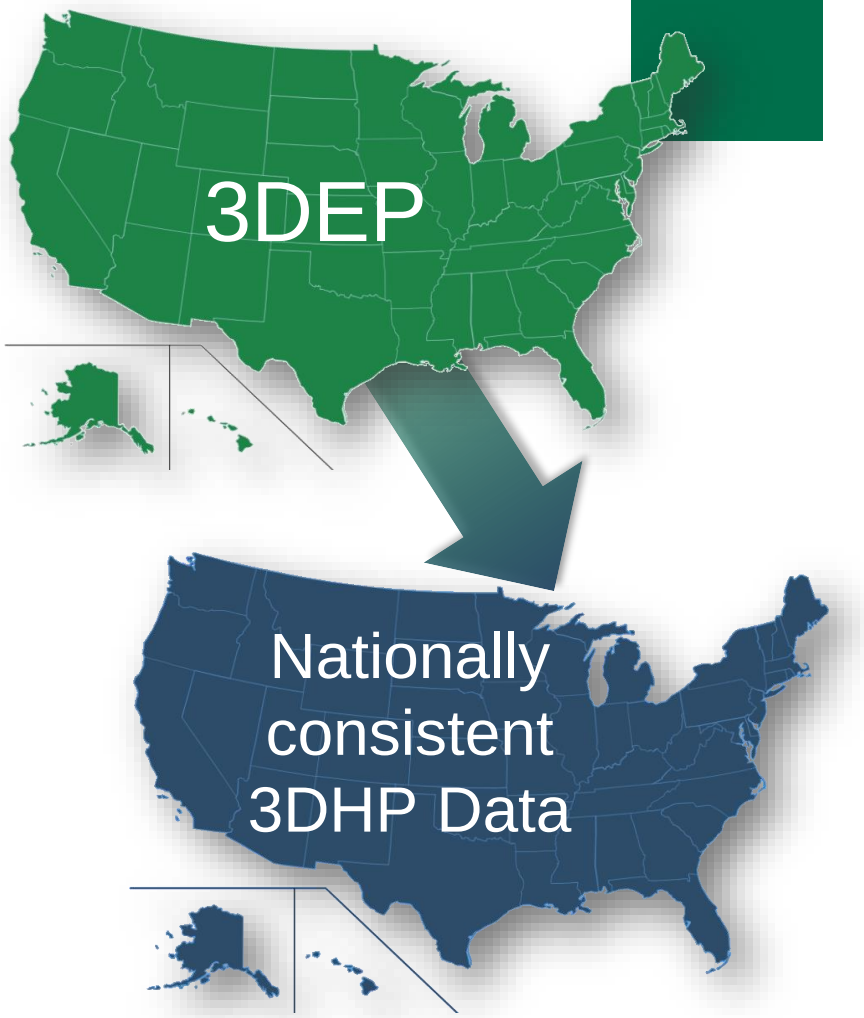
Hydrography Derived from Elevation Offers a Solution!

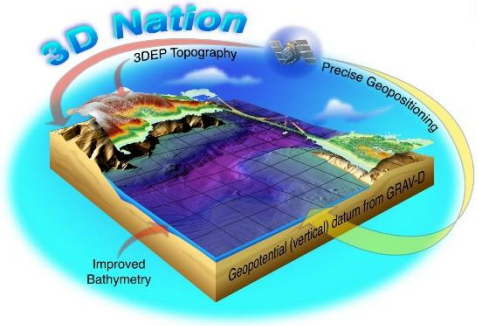
Introducing the 3D Hydrography Program (3DHP)

- 3DHP will provide national consistency while meeting local needs
- Goal to acquire new hydrography standardized to align vertically, horizontally, and temporally with 3DEP data, as well as other improvements
  - Supports national and regional-level issues like flooding, contaminant spills, water quality and quantity, drought, climate change, etc.
  - Supports more accurate, updated modeling and analysis capabilities
  - Supports sharing of water data as the geospatial framework underpinning the internet of water
- Data acquisition process to follow 3DEP Best Practices including coordinated governance and data acquisition
- Building on decades of work and concepts from current hydrography products



3D National Topography Model (3DNTM)

Integrates elevation and hydrography datasets to model the Nation's topography in 3D



3D Hydrography Program (3DHP)

- Hydrography derived from/integrated with 3D Elevation Program data
- Connections to groundwater, wetlands, and engineered hydrography
- §3DHP Infostructure for data sharing as part of the Internet of Water

"next gen" 3D Elevation Program (3DEP)

- New quality levels and refresh cycles
- Integration of inland bathymetry
- 3DEP Ecosystem for data and resource sharing
- Continual improvement with new technologies and approaches

Future Integrated 3D Model

- *Research and develop a 3D data model to fully integrate 3DHP and next gen 3DEP*
- *Integrate other data from The National Map*

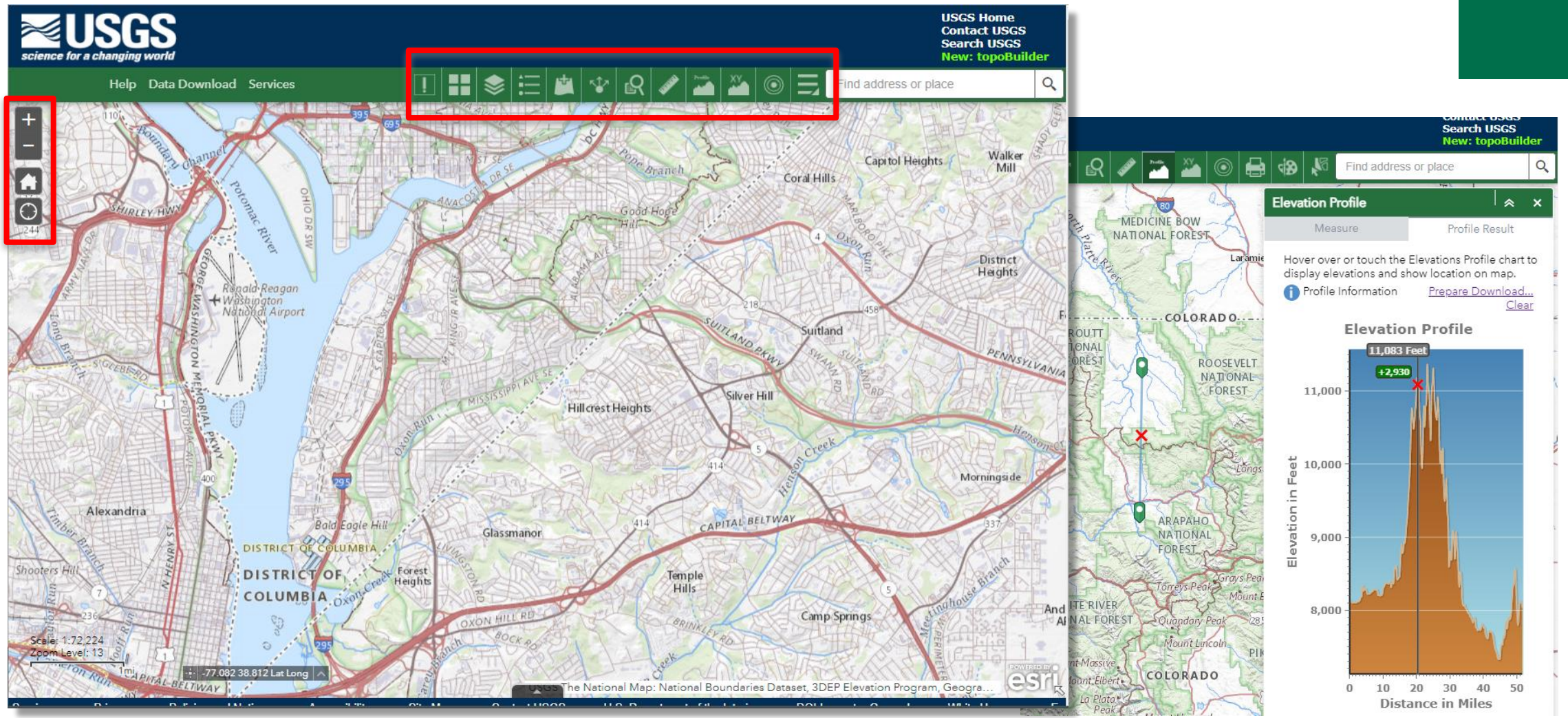
USGS

The National Map
Your Source for Topographic Information

The National Map Products and Services

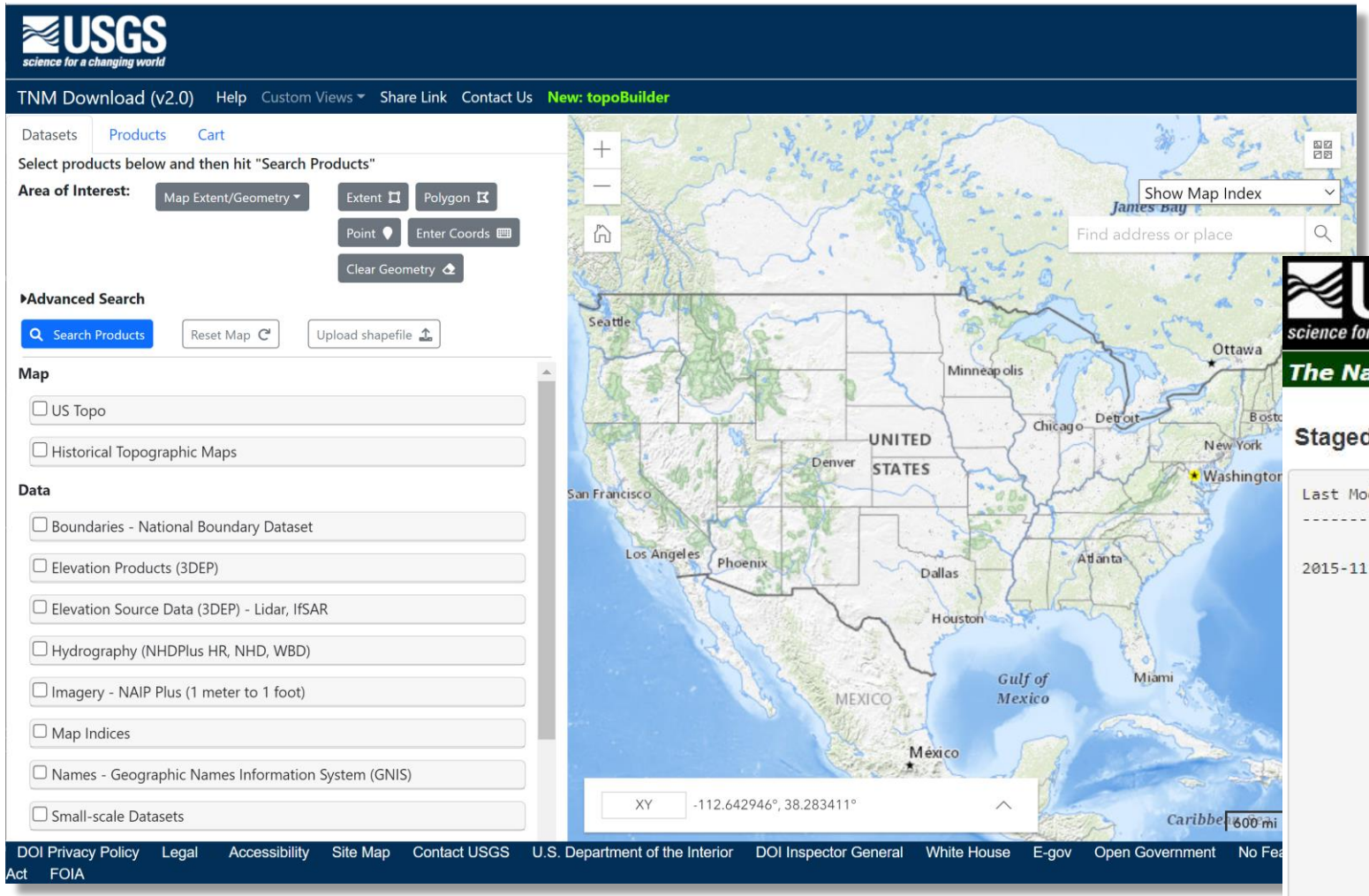
The National Map Viewer

apps.nationalmap.gov/viewer/

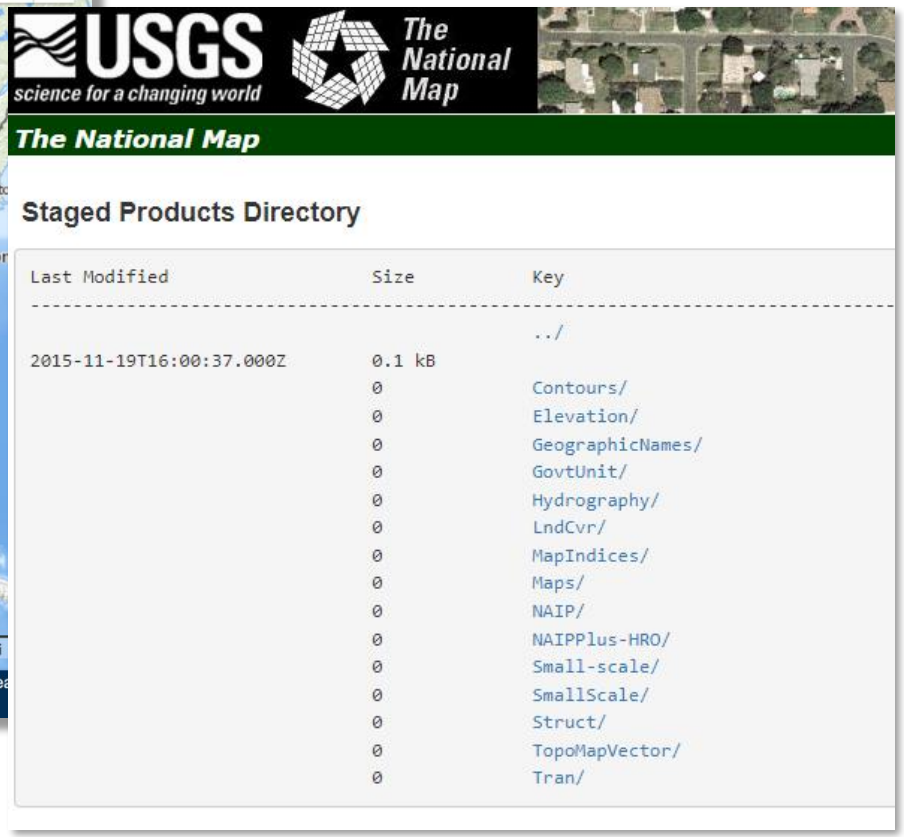


TNM Download Application

apps.nationalmap.gov/downloader/

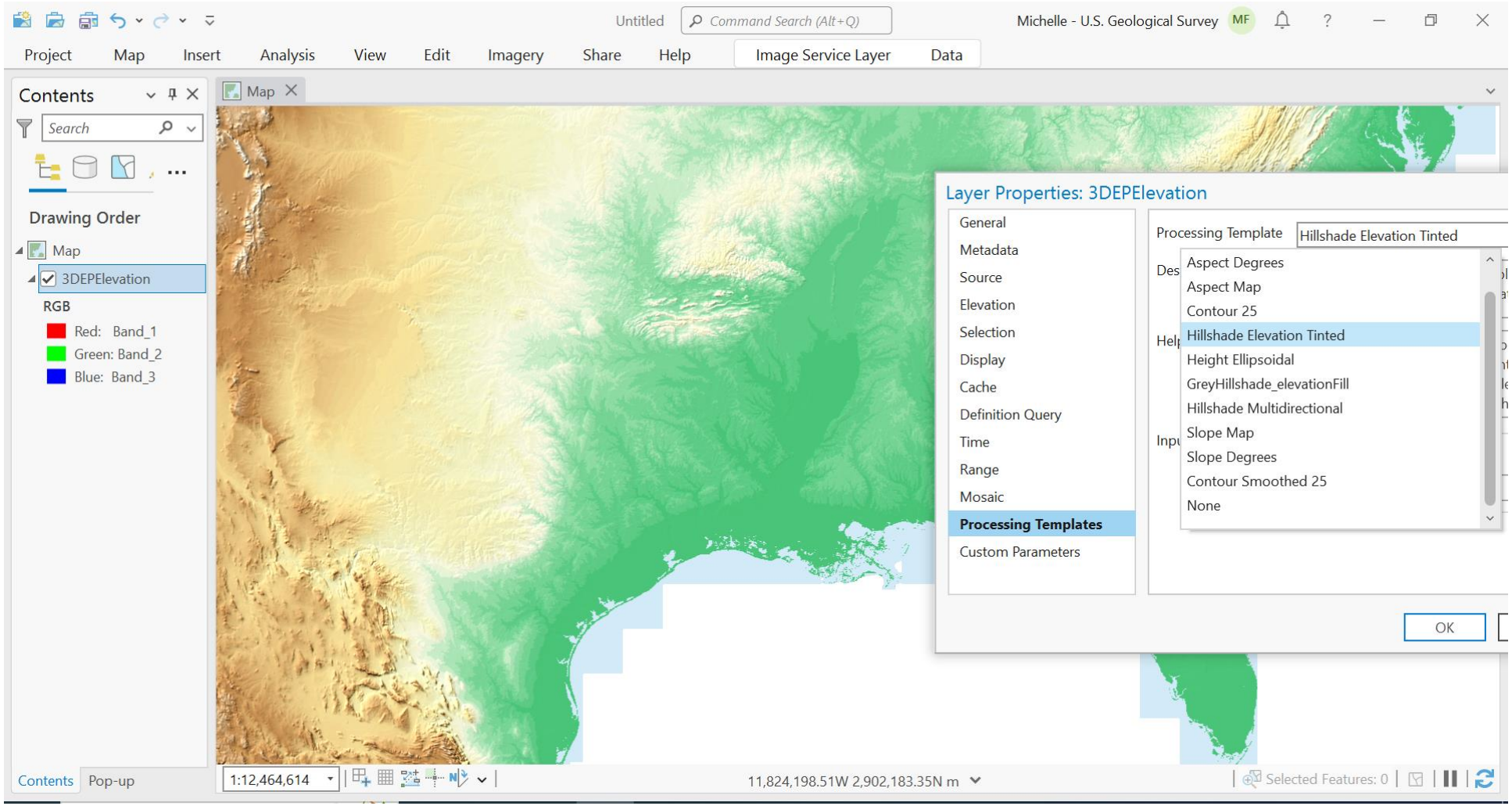


Direct access to data is also provided through The Amazon Cloud



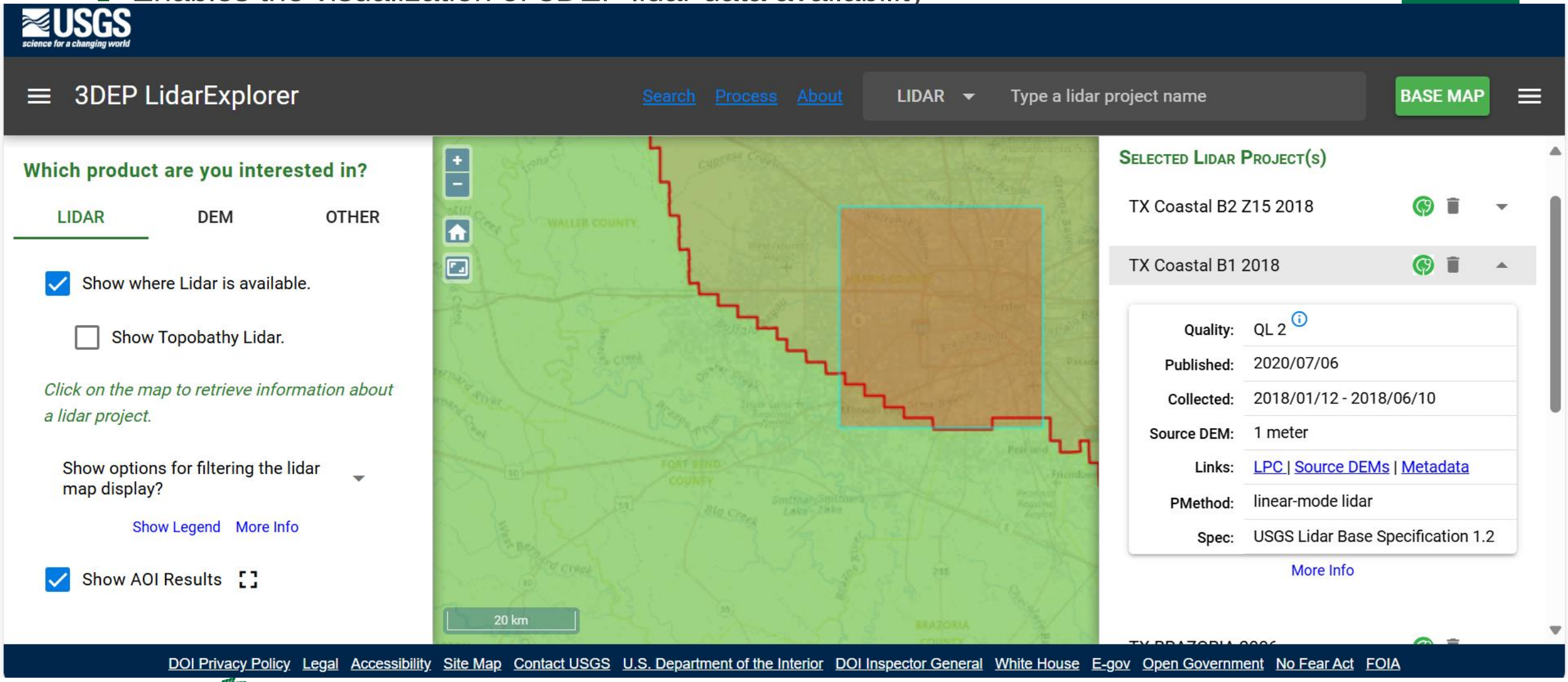
National Map Services List

apps.nationalmap.gov/services/



3DEP LidarExplorer

- Enables the visualization of 3DEP lidar data availability



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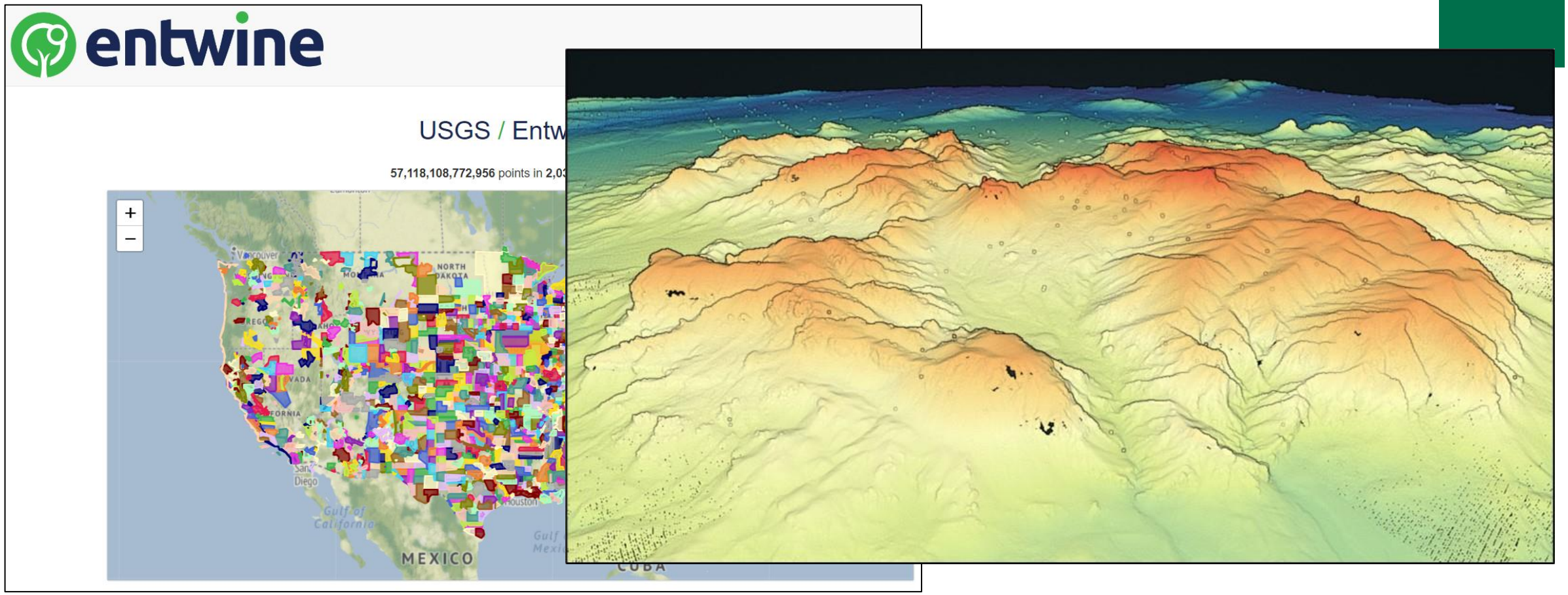
- https://apps.nationalmap.gov/lidar-explorer/

3DEP Point Cloud as Amazon Public Dataset

Visualization of USGS 3DEP Lidar Point Clouds as Entwine Point Tiles via an internet browser: https://usgs.entwine.io/



Registry info: https://registry.opendata.aws/usgs-lidar/

PDAL website - https://pdal.io/en/latest/

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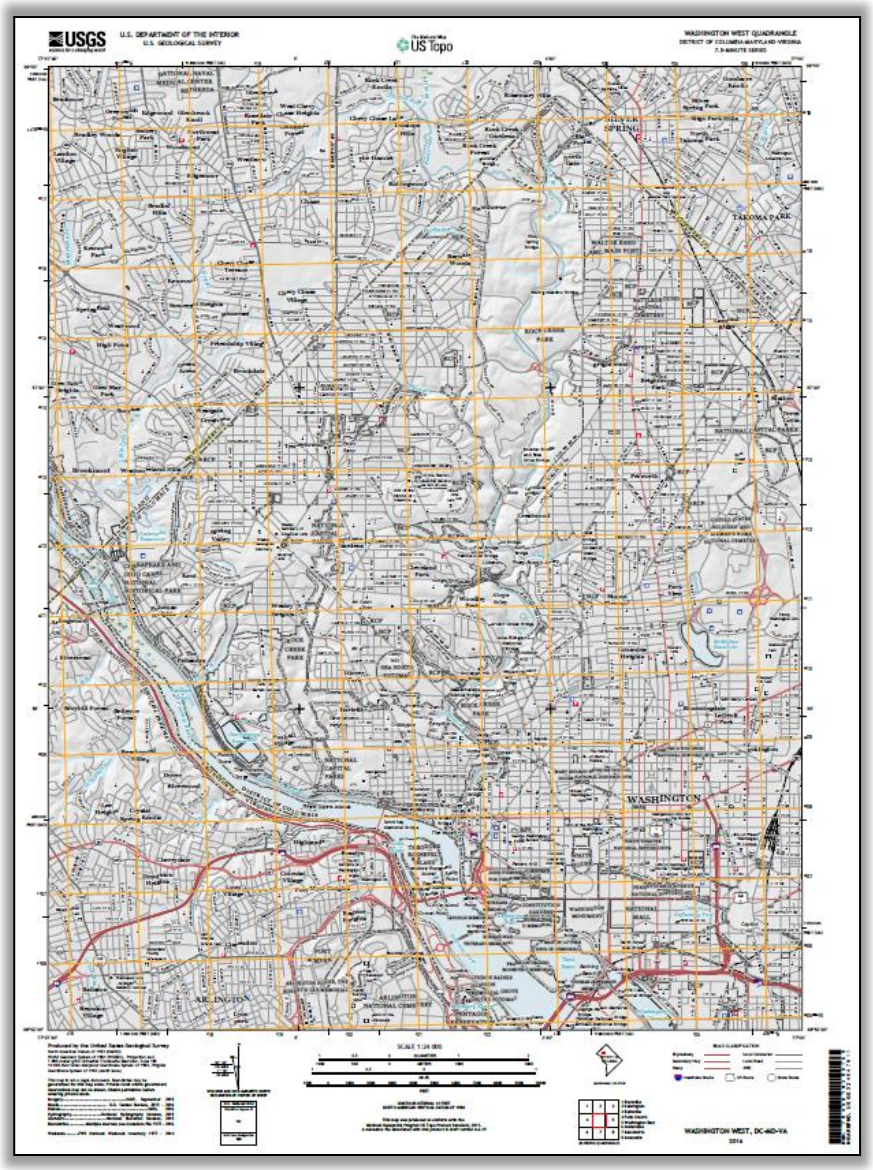
Cartographic Products: US Topo, Historical & topoBuilder

US Topo - www.usgs.gov/USTopo

- Digital USGS topographic map
- Modeled on traditional USGS 7.5-minute quadrangle paper topographic maps
- Historically 3-year production cycle, more than 18,000 maps produced / revised each year
- Download maps in GeoPDF or GeoTiff from:

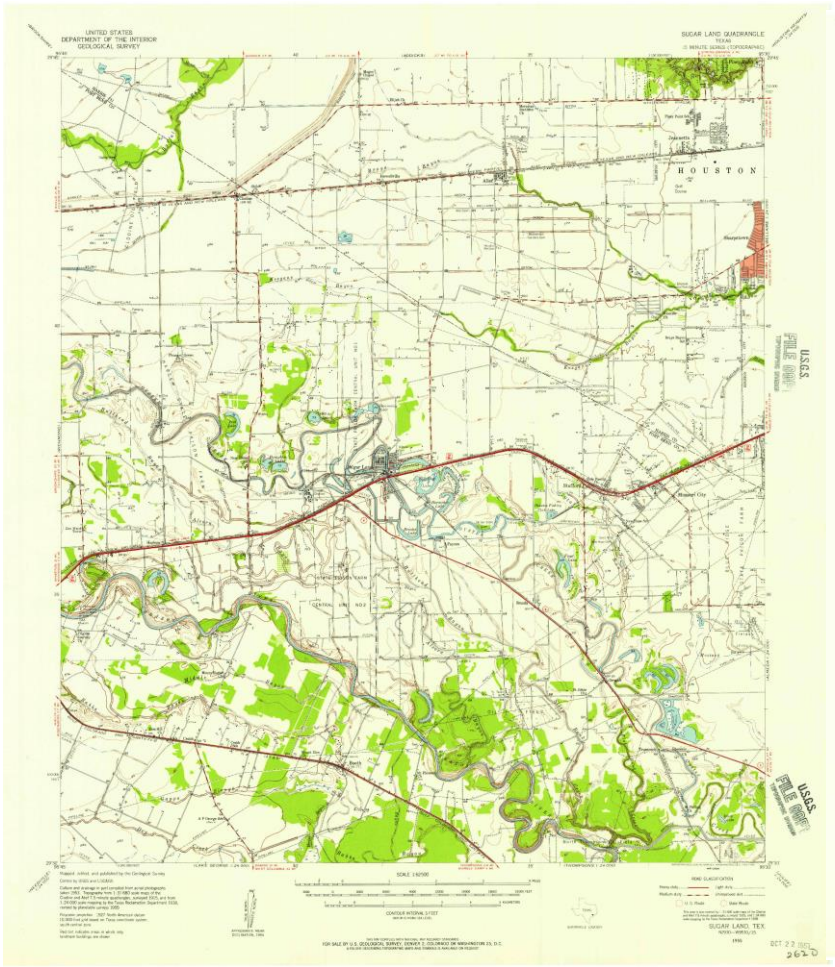
  The National Map:
  - https://apps.nationalmap.gov/downloader/

  USGS Store:
  - https://store.usgs.gov/



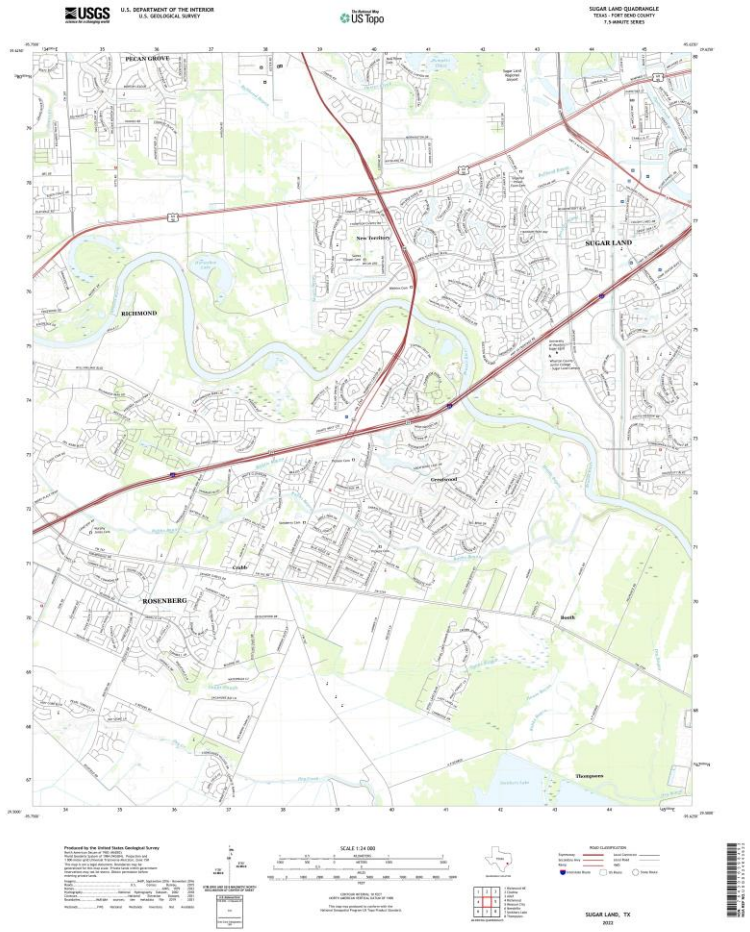
Historical Topographic Map Collection

ngmdb.usgs.gov/topoview/



1955 Sugar Land 1:62,500 scale

1970 Sugar Land 1:24,000 scale



2022 Sugar Land 1:24,000 scale

topoBuilder

- An application to make your own topographic map
- Created on demand
- Centered where you want
- In multiple formats
- Using the best available National Map data
- Free!

topobuilder.nationalmap.gov

USGS The National Map
Your Source for Topographic Information

USGS
science for a changing world

topoBuilder Application v: 1.4 User Guide

topoBuilder is here to stay!

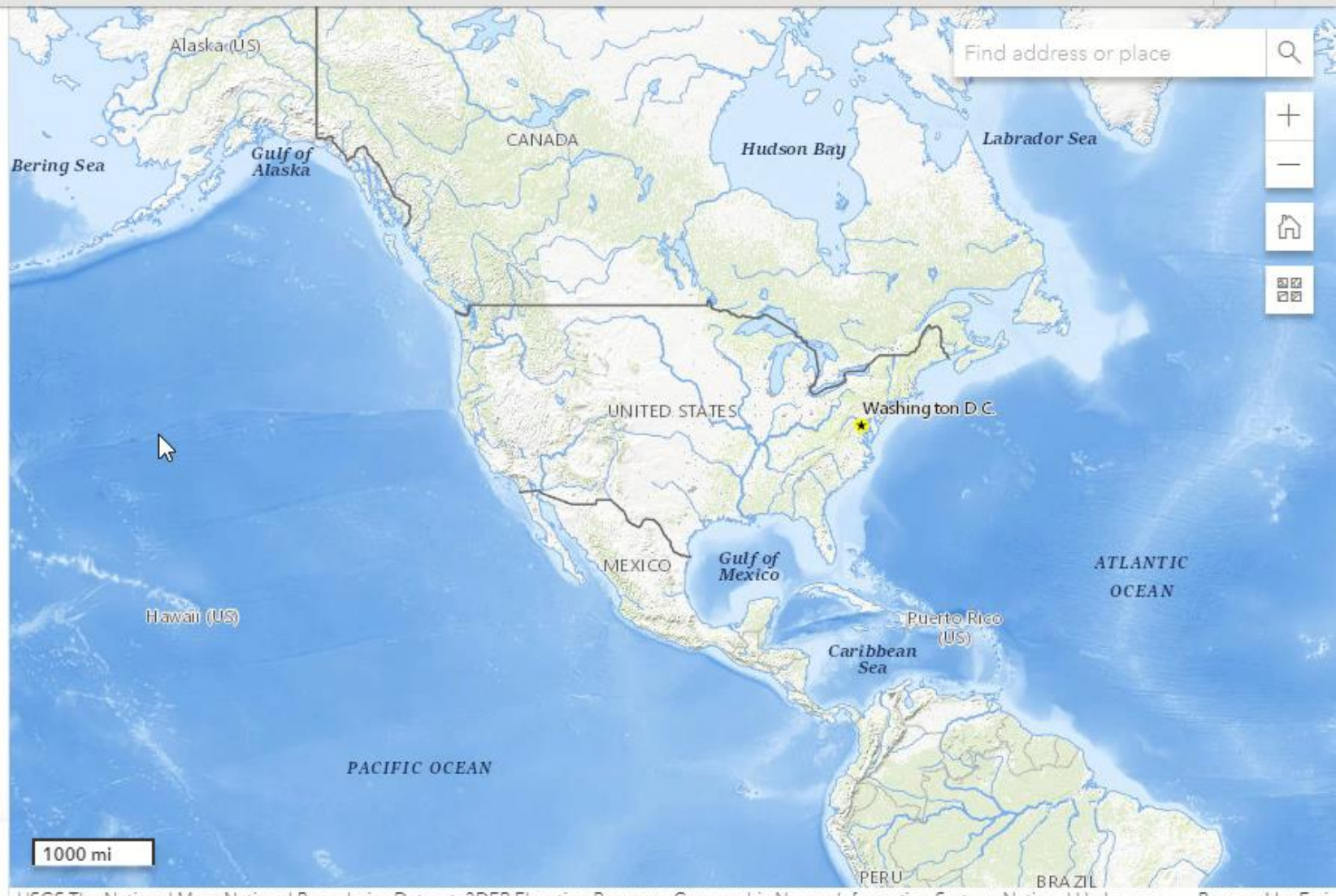
1 Map Types
2 Maps
3 Cart 1
Track
Help

Map Types

Select an OnDemand Topo type, click Next

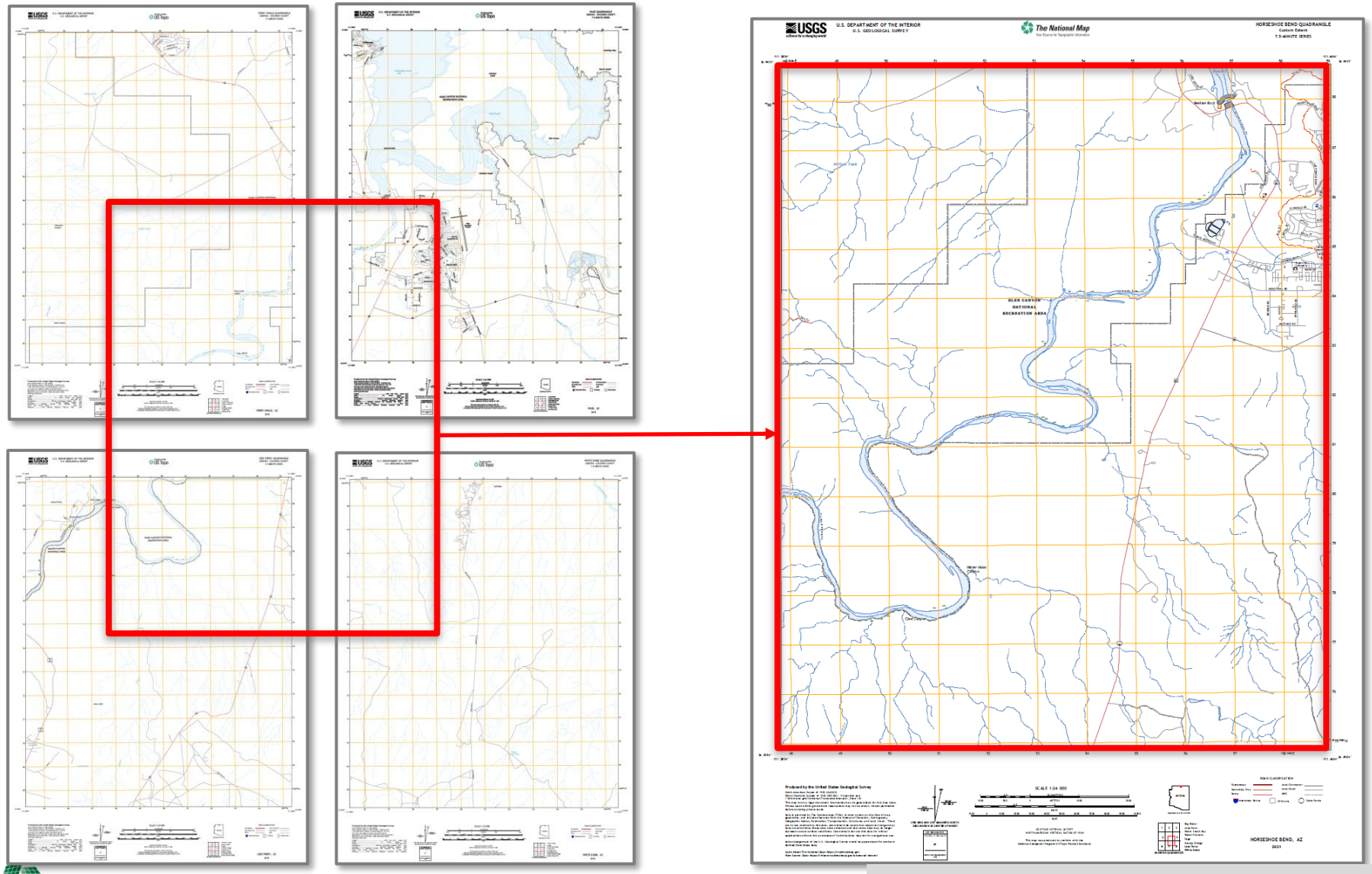
7.5-Minute Topo

NEXT



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrograp... Powered by Esri

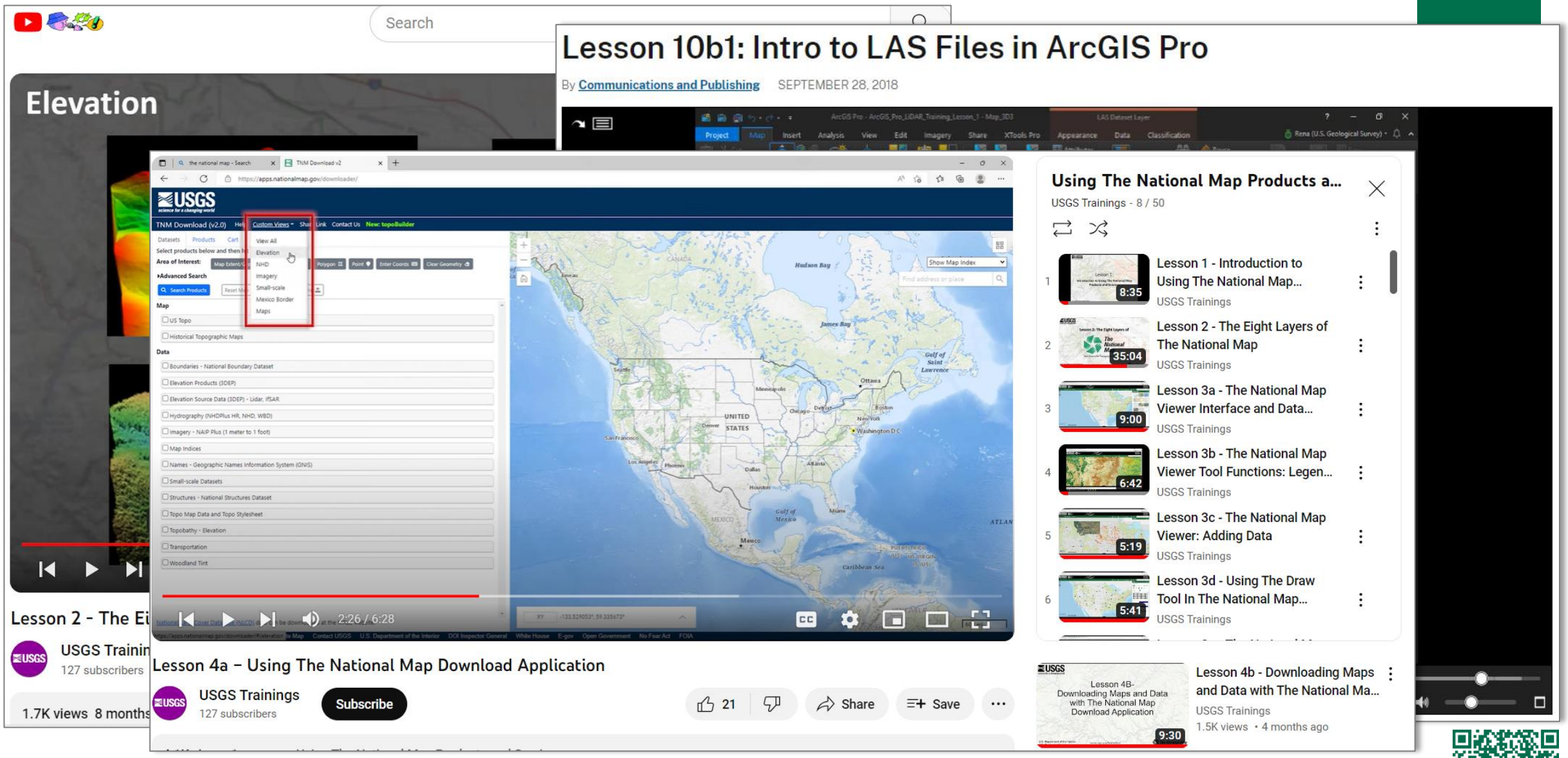
topoBuilder Deliverable – OnDemand Topo



USGS The National Map
Your Source for Topographic Information

topobuilder.nationalmap.gov

National Map Training Videos



USGS The National Map
Your Source for Topographic Information

www.usgs.gov/NGPvideos

USGS Educational Resources

https://www.usgs.gov/educational-resources

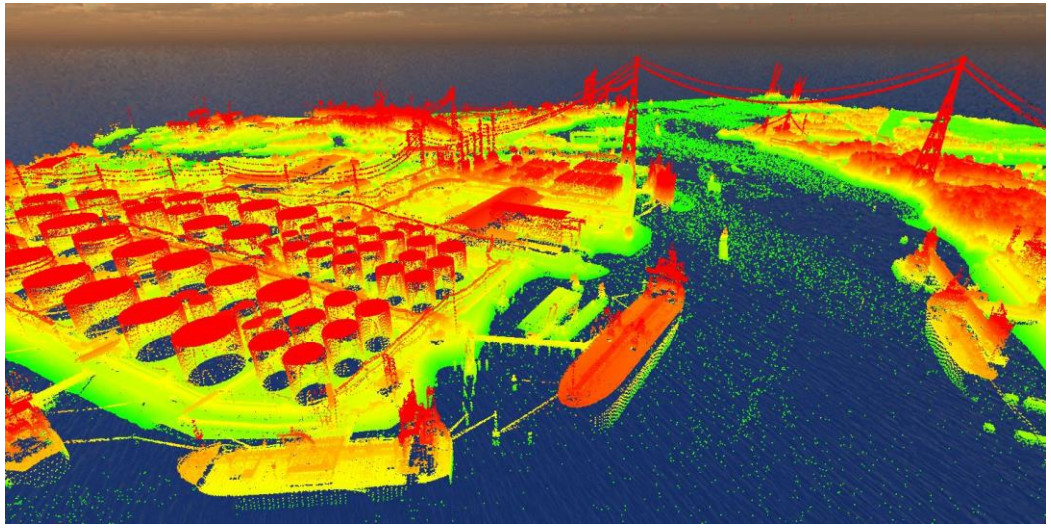
- Ecosystems
- Geography
- Hazards
- Oceans and Coast
- Water Resources
- Data in Schools
- Adventures in STEM

- Youth and Education in Science contact: usgs_yes@usgs.gov
- Remote Sensing for the classroom
- Geography activities
- General background information for teachers

- Non-USGS resources:
  - America View https://americaview.org/
  - ESRI https://www.esri.com/en-us/industries/k-12-education/geoinquiries

Thank you!

Michelle Fischer
fischerm@usgs.gov
985-415-7061



- 3DEP: usgs.gov/3DEP
- 3DHP: usgs.gov/3dhp
- TNM apps: apps.nationalmap.gov
- TNN Data Delivery: www.usgs.gov/the-national-map-data-delivery
- TNM Viewer: apps.nationalmap.gov/viewer/
- TNM Downloader: apps.nationalmap.gov/downloader/
- TNM Services: apps.nationalmap.gov/services/
- LidarExplorer: apps.nationalmap.gov/lidar-explorer/
- Point cloud viewer: usgs.entwine.io/

- US Topo: www.usgs.gov/USTopo
- Historical topos: ngmdb.usgs.gov/topoview/
- Custom topos: topobuilder.nationalmap.gov
- TNM Training Videos: www.usgs.gov/NGPvideos
- Geospatial Information Response Team (GIRT): https://www.usgs.gov/ngp-user-engagement-office/geospatial-information-response-team

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