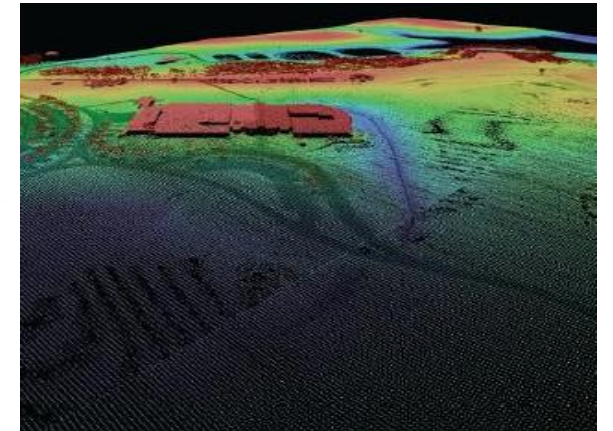
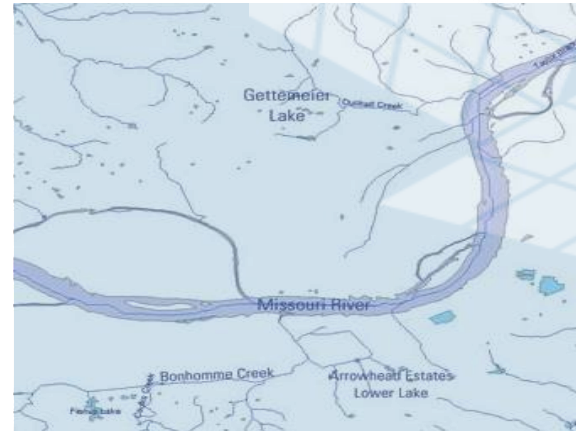
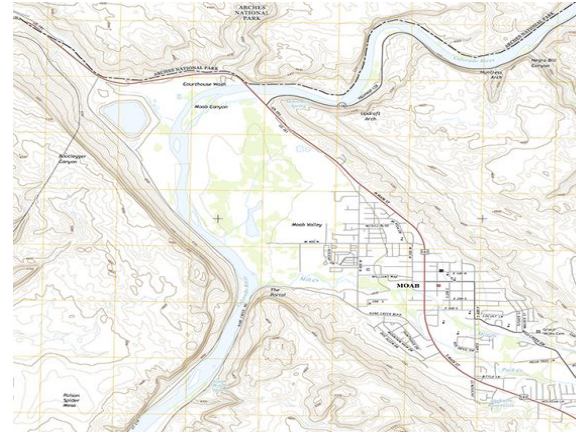




The National Map (TNM) – Your Source for Topographic Information



Fort Bend GIS Consortium Meeting
February 13, 2025

Michelle Fischer – National Map Liaison for AR, LA, OK, and TX

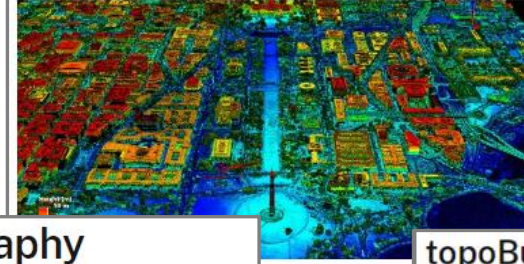
+ USGS National Geospatial Program

Mission

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

Authoritative
ccessible
vailable
ccurate

3D Elevation Program



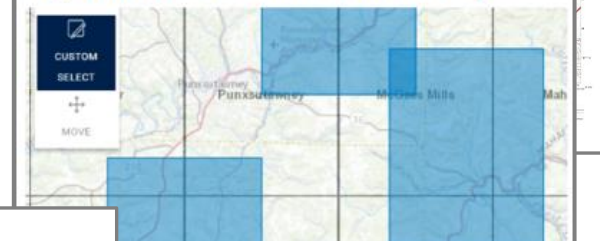
US Topo



3D Hydrography Program



topoBuilder & OnDemand Topo



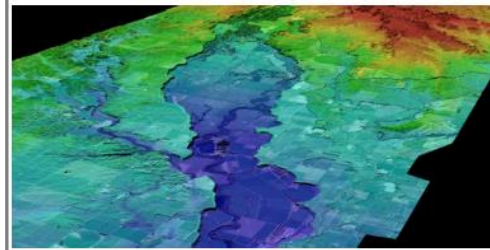
The National Map Viewer



The National Map Training Videos



Data Access and Visualization Apps



GIS Data

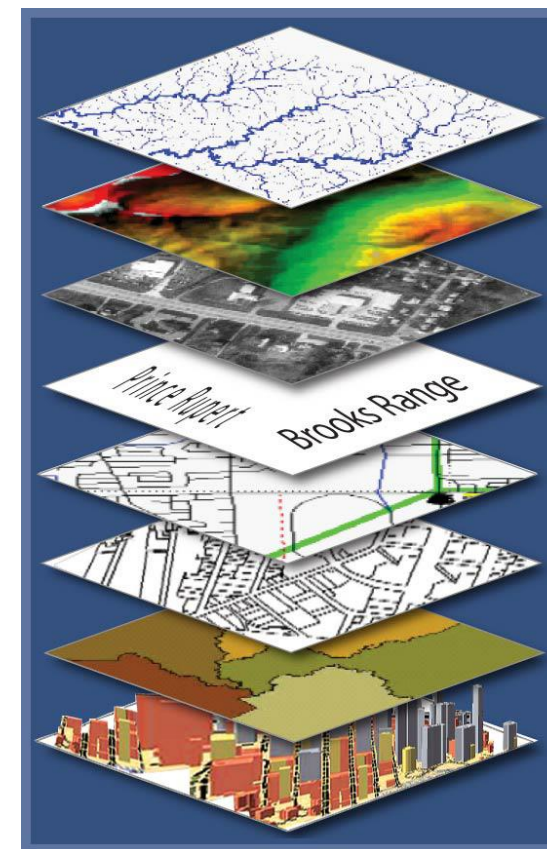


NGP Emergency Response Event Support Map

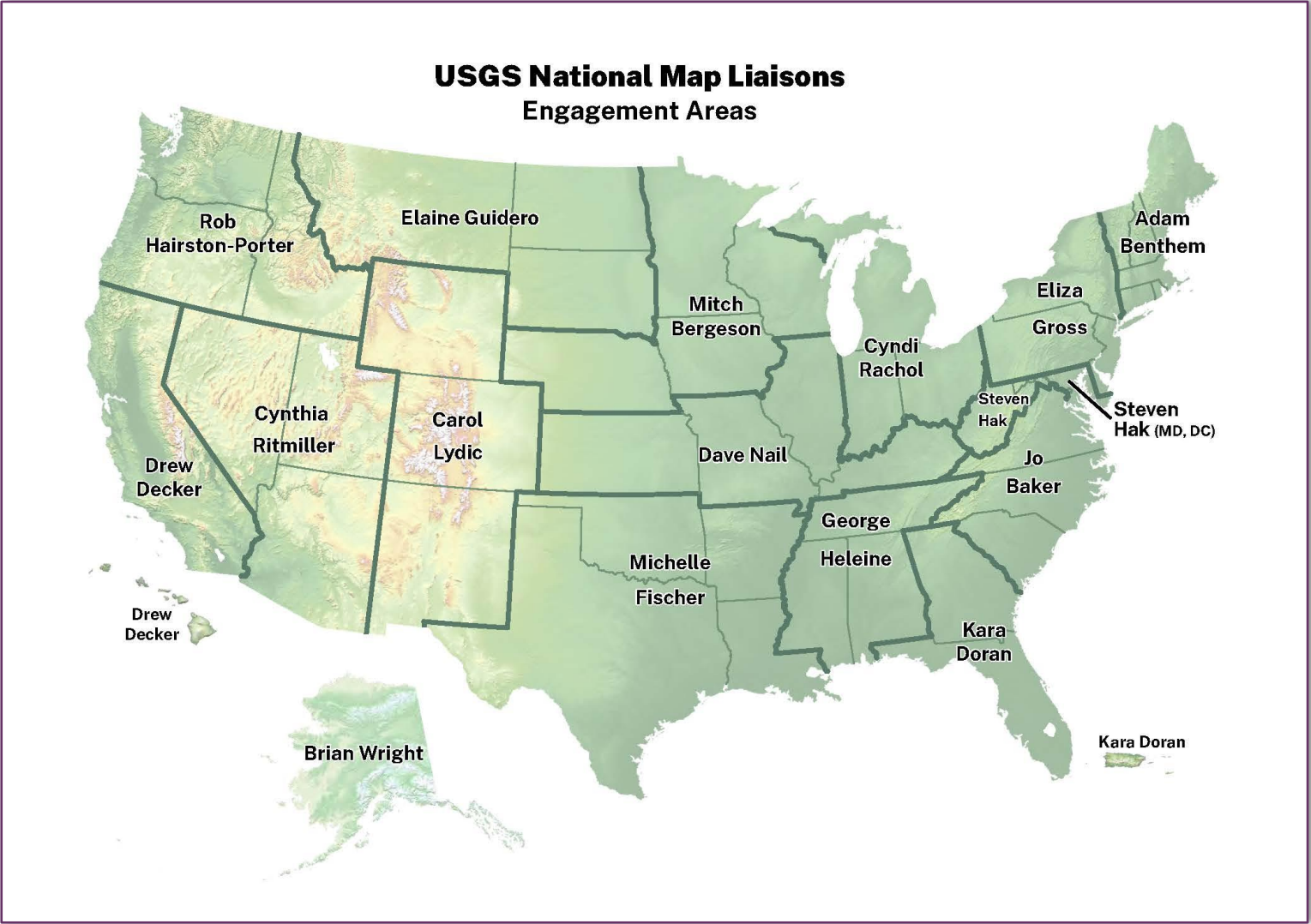


The National Map

- *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





Geospatial Information Response Team



usgs.gov/GIRT



Fires



Floods



Hurricanes



Landslides



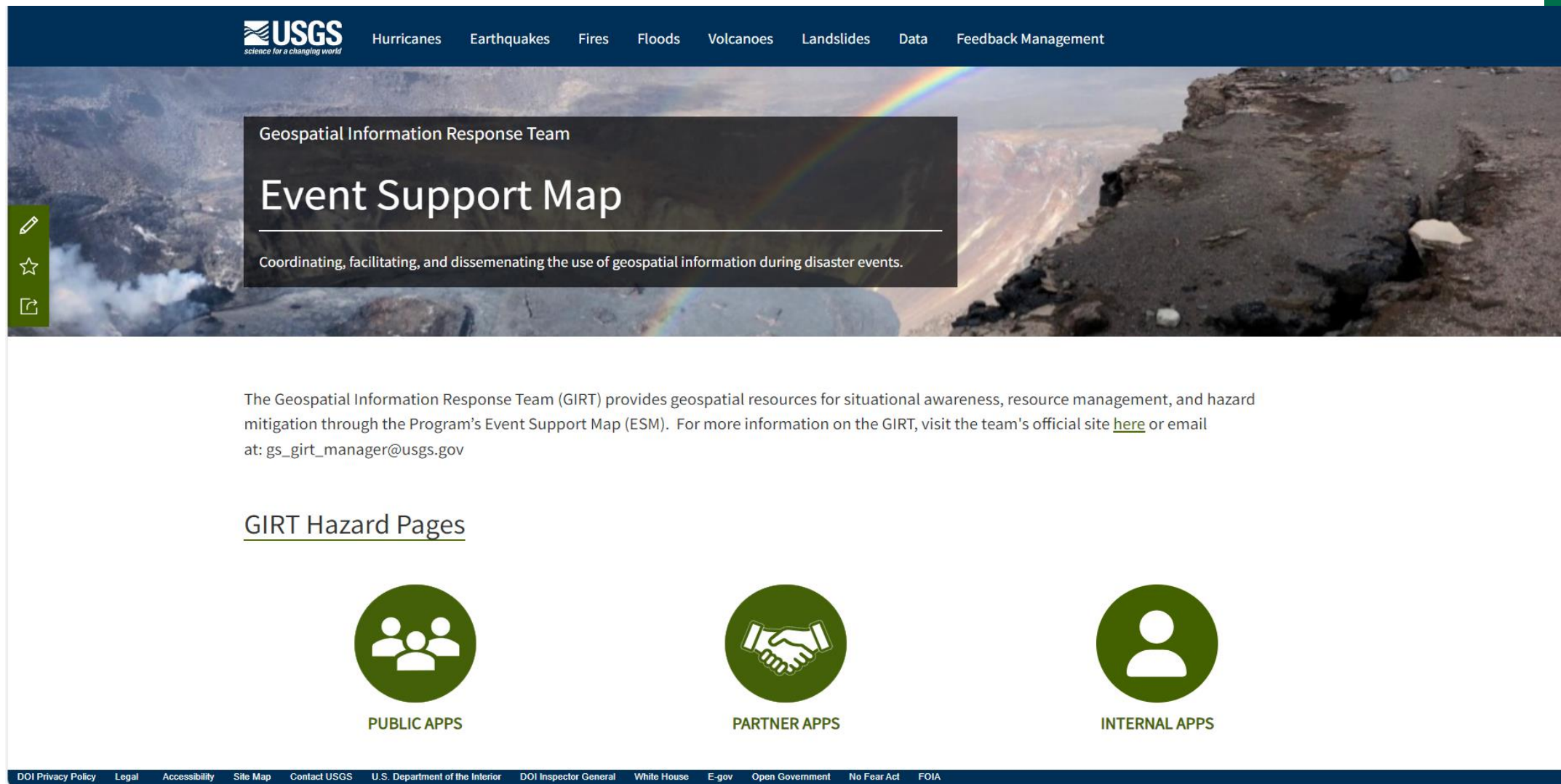
Volcanoes



Earthquakes



GIRT EVENT SUPPORT MAP HUB SITE



The screenshot displays the USGS GIRT Event Support Map Hub Site. The header features the USGS logo and a navigation menu with links for Hurricanes, Earthquakes, Fires, Floods, Volcanoes, Landslides, Data, and Feedback Management. The main banner image shows a volcanic landscape with a rainbow. A dark overlay on the banner contains the text "Geospatial Information Response Team" and "Event Support Map", followed by the description "Coordinating, facilitating, and disseminating the use of geospatial information during disaster events." A left sidebar contains icons for edit, favorite, and share. Below the banner, a paragraph describes the GIRT's role in providing geospatial resources for situational awareness, resource management, and hazard mitigation, with a link to the team's official site and an email address. A section titled "GIRT Hazard Pages" is followed by three circular icons representing "PUBLIC APPS", "PARTNER APPS", and "INTERNAL APPS". The footer contains a list of links including 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, and FOIA.

USGS science for a changing world

Hurricanes Earthquakes Fires Floods Volcanoes Landslides Data Feedback Management

Geospatial Information Response Team

Event Support Map

Coordinating, facilitating, and disseminating the use of geospatial information during disaster events.

The Geospatial Information Response Team (GIRT) provides geospatial resources for situational awareness, resource management, and hazard mitigation through the Program's Event Support Map (ESM). For more information on the GIRT, visit the team's official site [here](#) or email at: gs_girt_manager@usgs.gov

GIRT Hazard Pages

PUBLIC APPS PARTNER APPS INTERNAL APPS

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

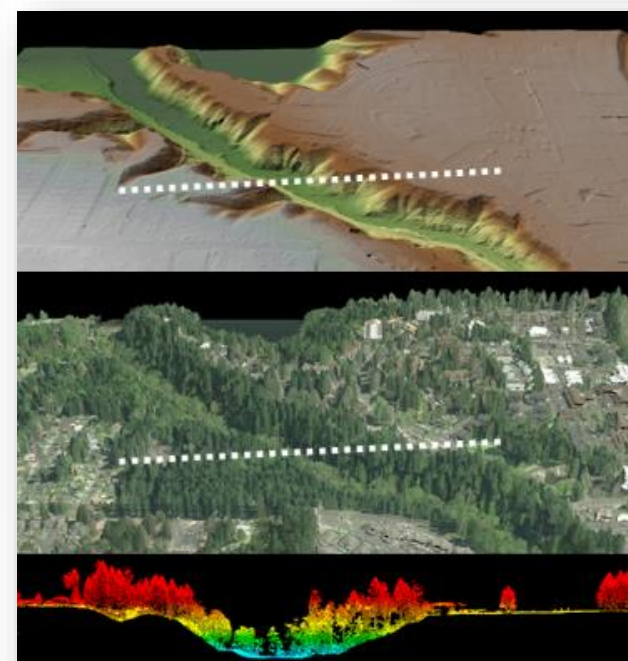
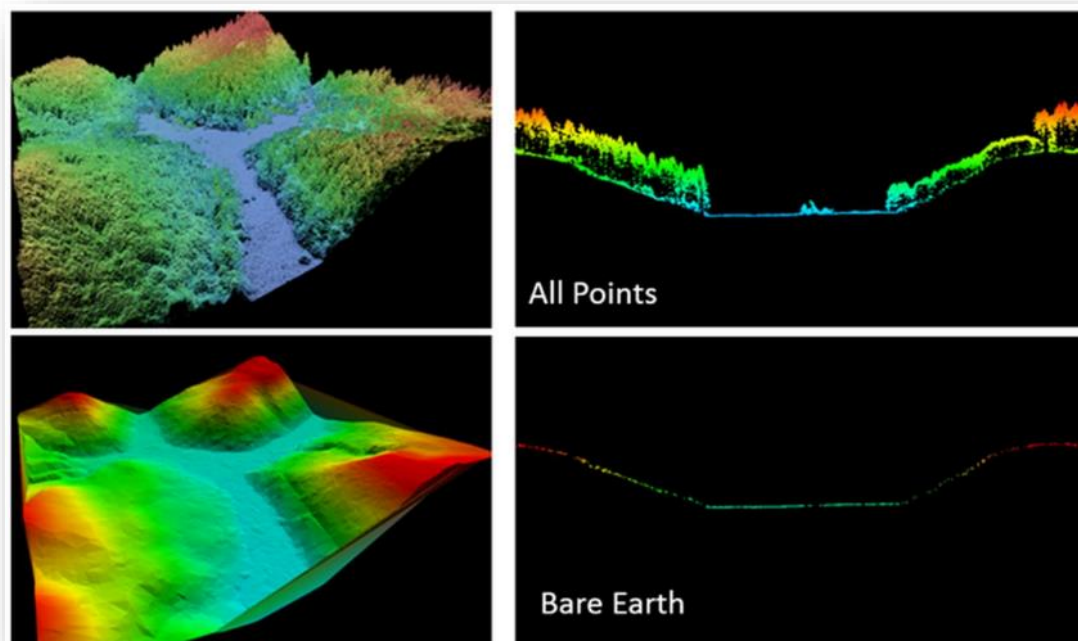
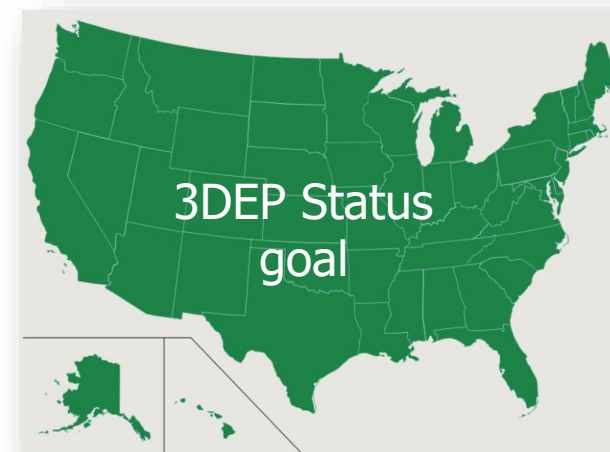




Topographic Data

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

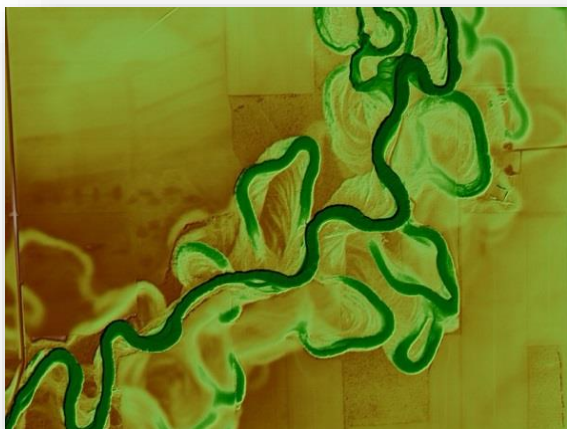
← Lidar point cloud
(colorized by aerial
photo)

← Lidar profile

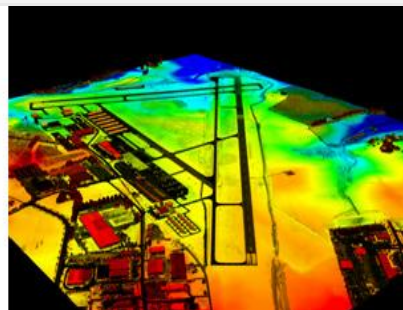
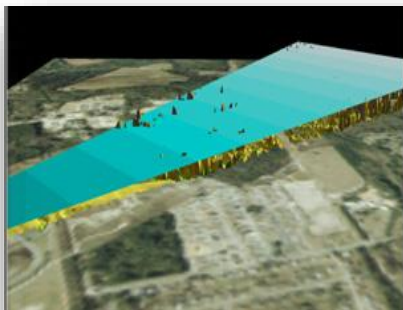
‡ 3D Elevation Program (3DEP)

Mission Critical Applications

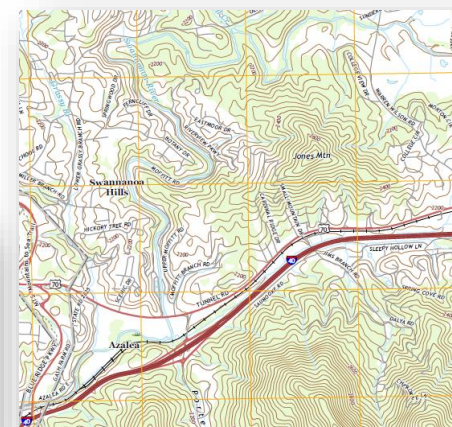
9



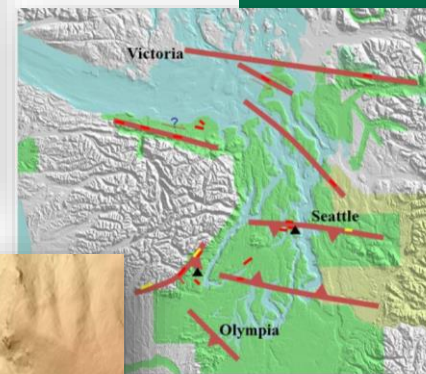
Flood Risk Management



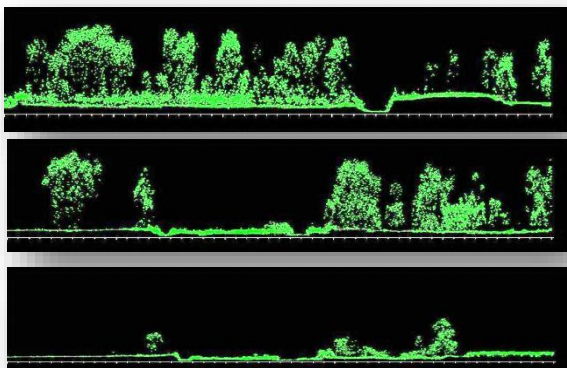
Aviation Safety



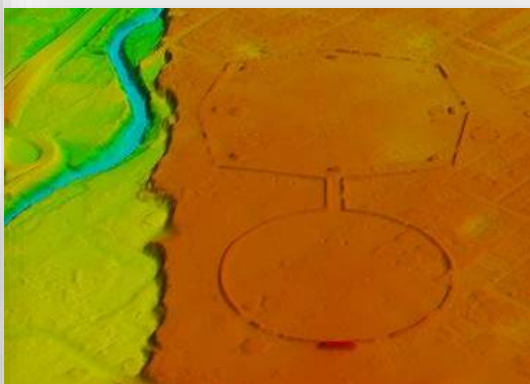
US Topo Contours



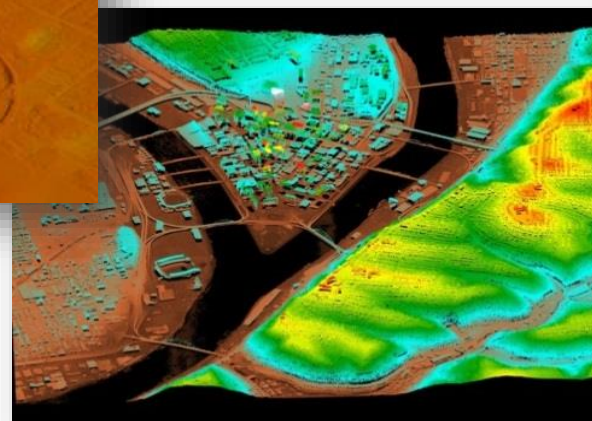
Geologic Hazards



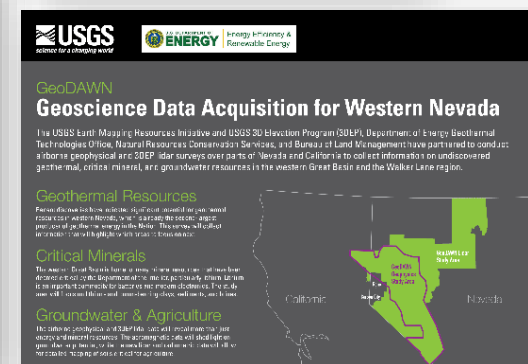
Precision Forestry



Archaeology



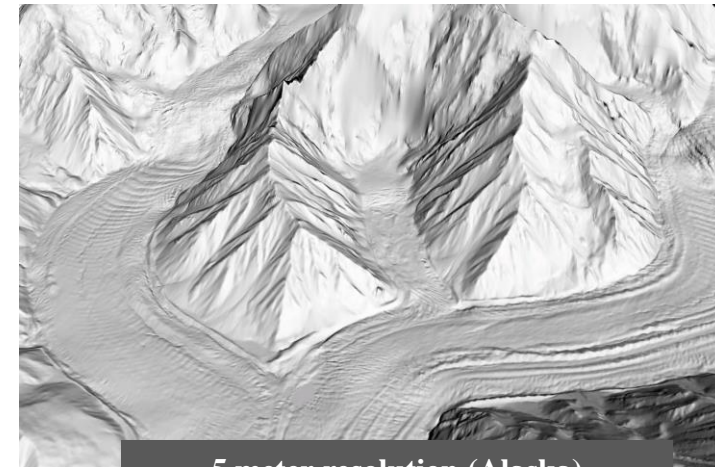
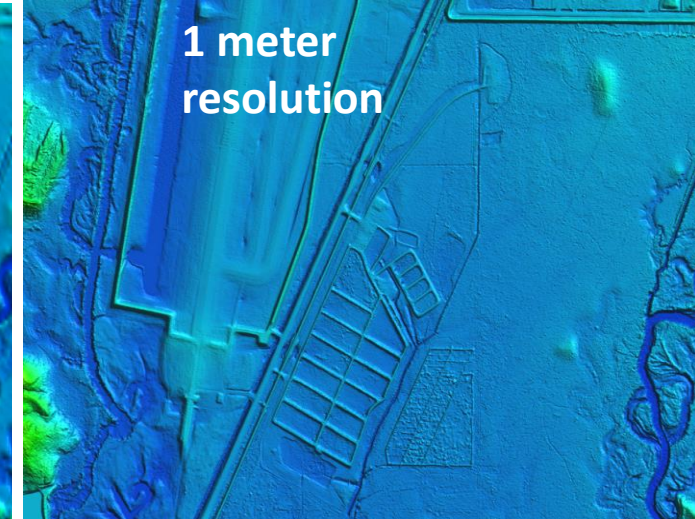
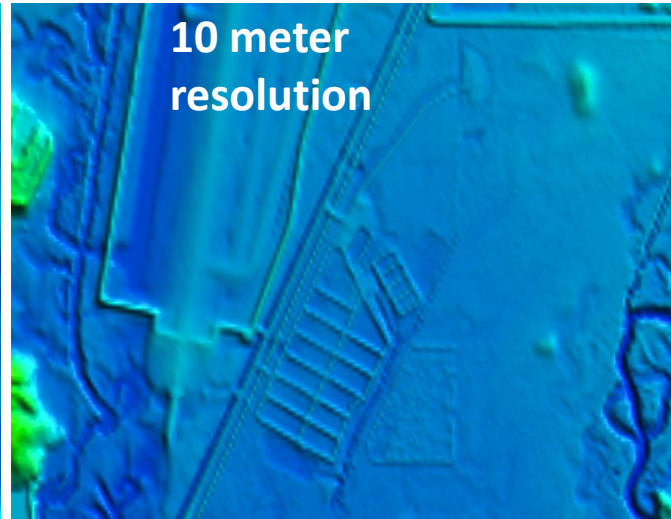
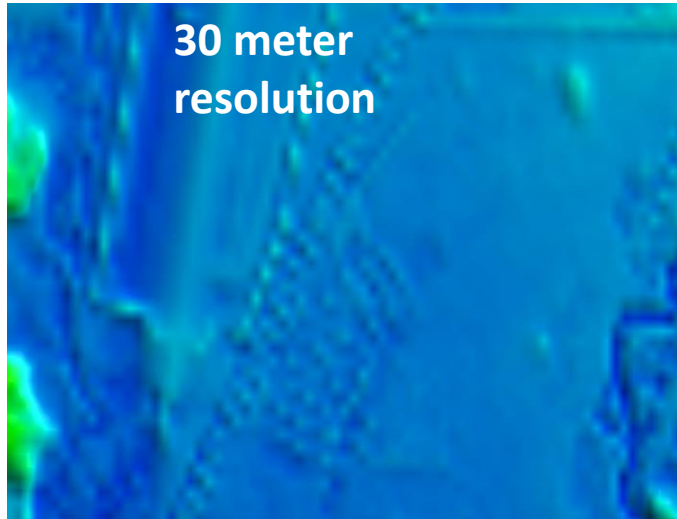
Infrastructure Management



Alternative Energy

3DEP Data Quality

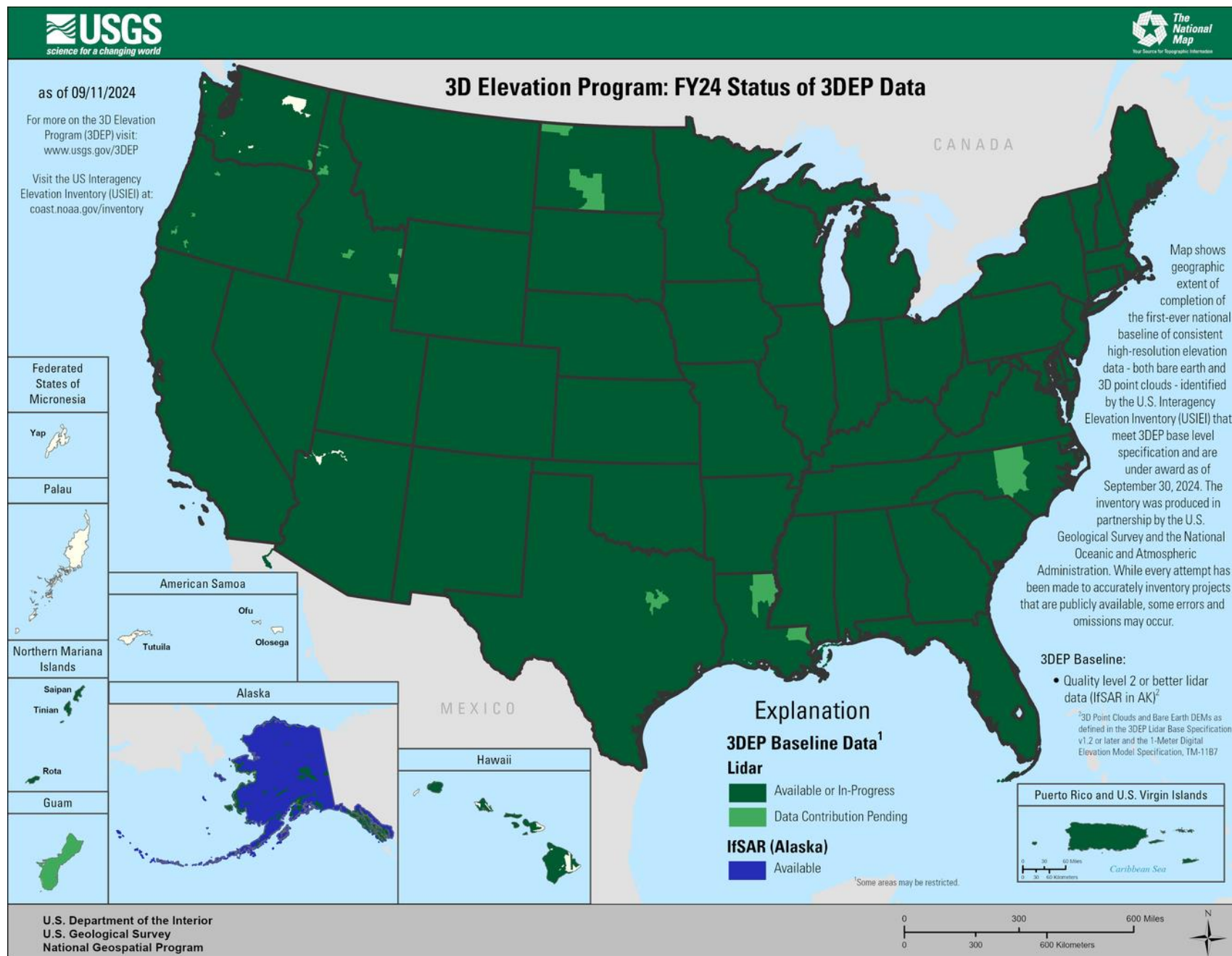
Improves and Enables Applications





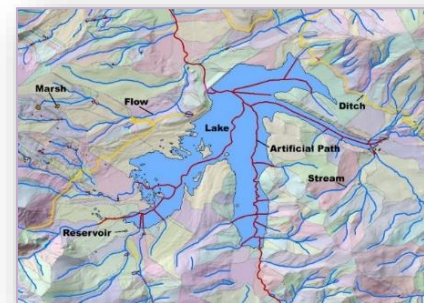
3DEP Status

usgs.gov/3DEP



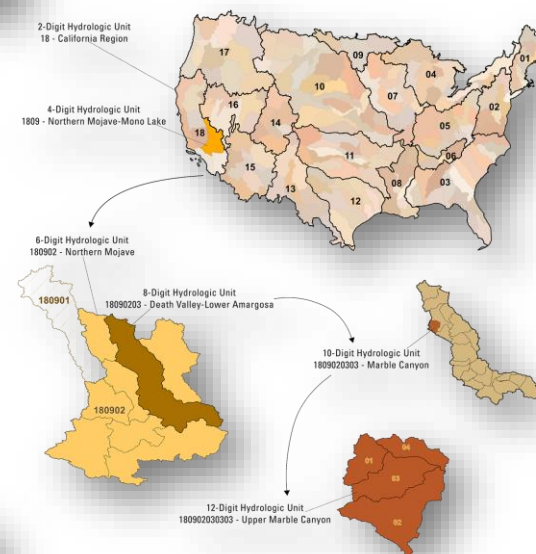
Previous Approach to National Hydrography Datasets

- 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

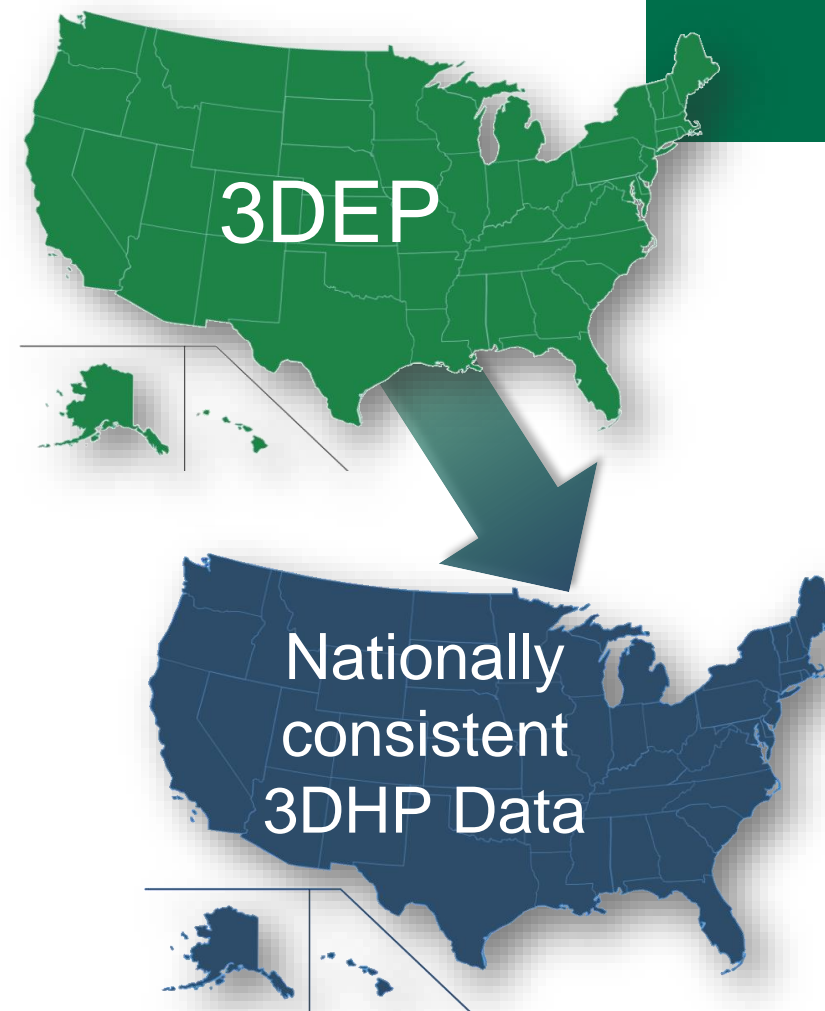


NHDPlus
High
Resolution

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

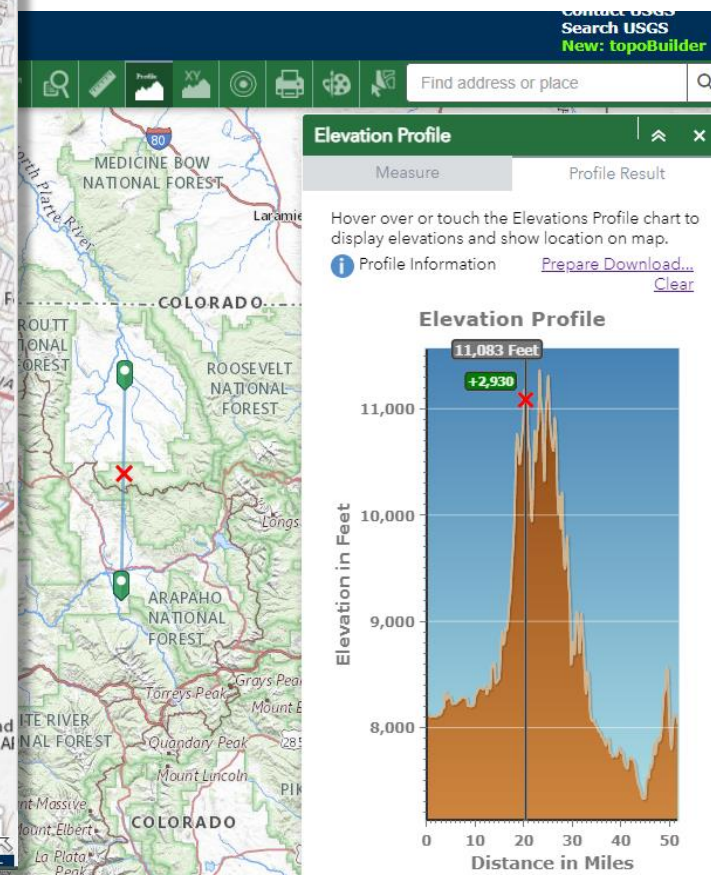
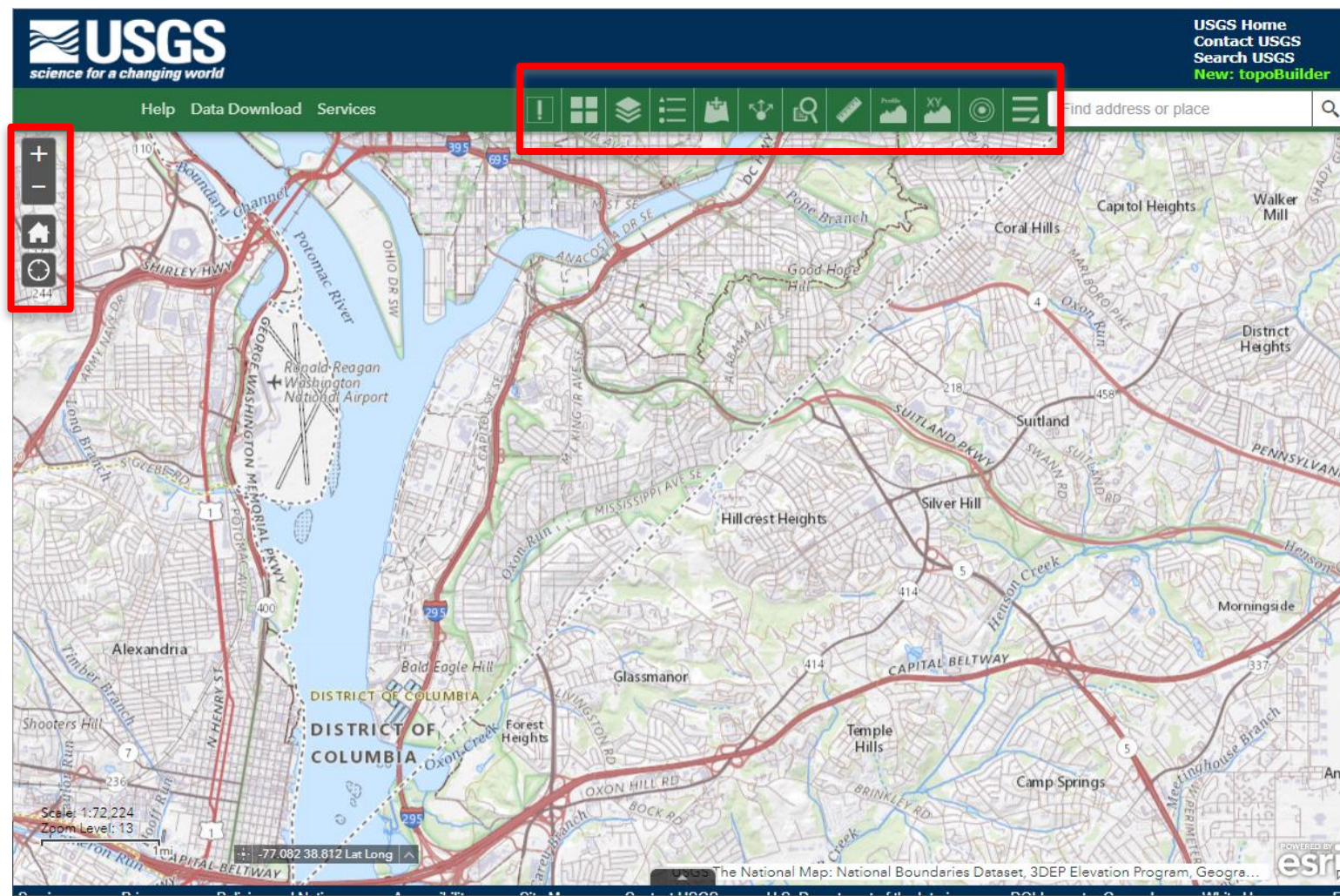
- Research and develop a 3D data model to fully integrate 3DHP and next gen 3DEP
- Integrate other data from The National Map

The National Map Products and Services



The National Map Viewer

apps.nationalmap.gov/viewer/



+ TNM Download Application

apps.nationalmap.gov/downloader/

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Direct access to data is also provided through The Amazon Cloud

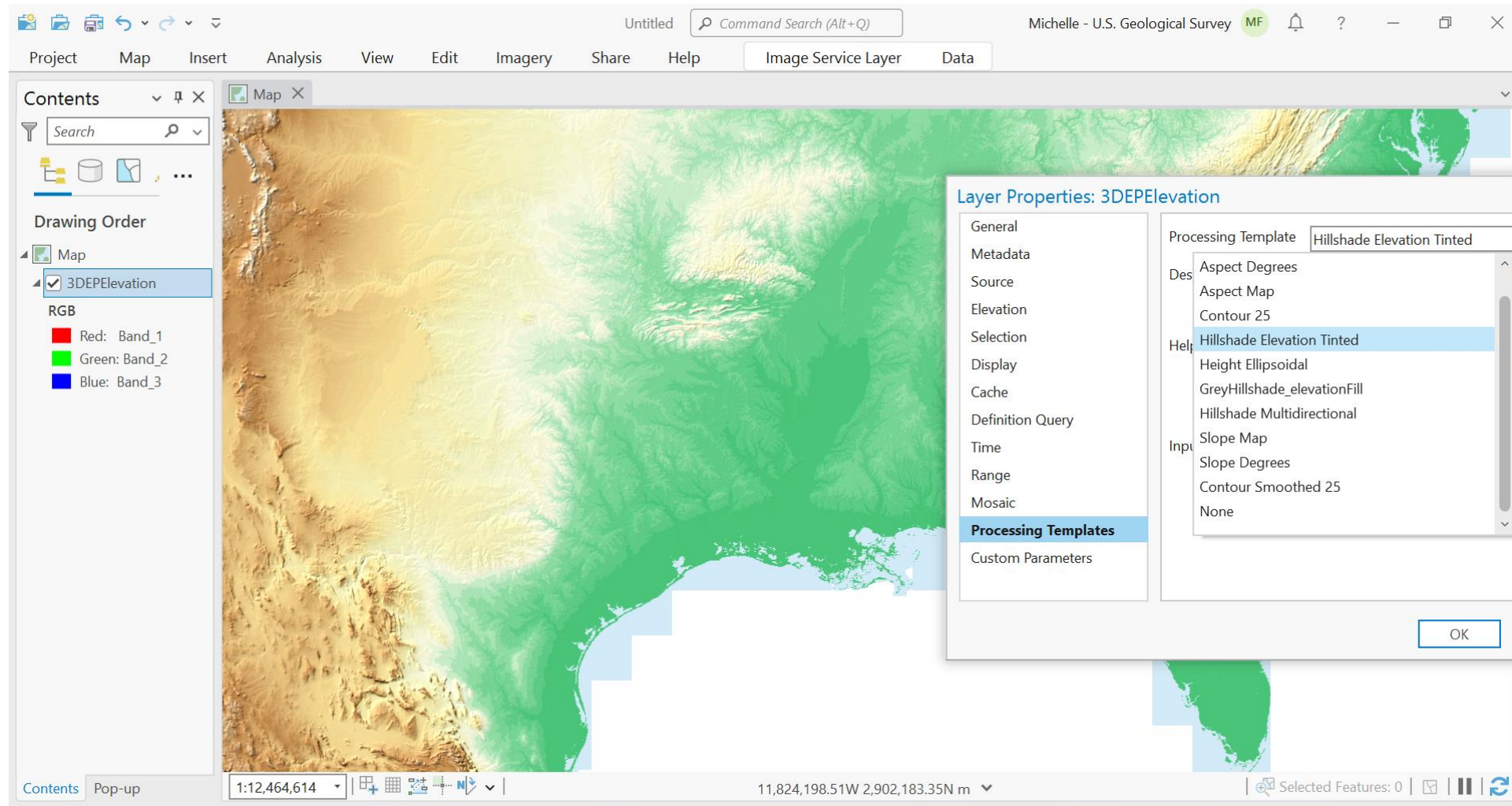
Last Modified	Size	Key
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	0	GovtUnit/
	0	Hydrography/
	0	LndCvr/
	0	MapIndices/
	0	Maps/
	0	NAIP/
	0	NAIPPlus-HRO/
	0	Small-scale/
	0	SmallScale/
	0	Struct/
	0	TopoMapVector/
	0	Tran/



+ National Map Services List

apps.nationalmap.gov/services/

18



+ 3DEP LidarExplorer

19

- Enables the visualization of 3DEP lidar data availability

The screenshot displays the 3DEP LidarExplorer web application. The top navigation bar includes the USGS logo, the title '3DEP LidarExplorer', and links for 'Search', 'Process', and 'About'. A search bar is labeled 'LIDAR' and 'Type a lidar project name', with a 'BASE MAP' button to its right. The main content area is divided into three sections. On the left, under 'Which product are you interested in?', the 'LIDAR' tab is selected. It contains two checkboxes: 'Show where Lidar is available.' (checked) and 'Show Topobathy Lidar.' (unchecked). Below these is a note: 'Click on the map to retrieve information about a lidar project.' and a dropdown menu 'Show options for filtering the lidar map display?'. At the bottom of this section are links for 'Show Legend' and 'More Info', and another checked checkbox 'Show AOI Results' with a full-screen icon. The center section is a map of Texas showing county boundaries and a red stepped boundary. An orange rectangular area of interest is highlighted in the northeast. A scale bar at the bottom left of the map indicates '20 km'. On the right, the 'SELECTED LIDAR PROJECT(S)' section lists two projects: 'TX Coastal B2 Z15 2018' and 'TX Coastal B1 2018'. A pop-up window for the selected project displays the following metadata: Quality: QL 2, Published: 2020/07/06, Collected: 2018/01/12 - 2018/06/10, Source DEM: 1 meter, Links: LPC | Source DEMs | Metadata, PMethod: linear-mode lidar, and Spec: USGS Lidar Base Specification 1.2. A 'More Info' link is at the bottom of the pop-up. The footer contains various links including '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', and 'FOIA'. The USGS logo and 'The National Map' logo are also present in the footer.



■ <https://apps.nationalmap.gov/lidar-explorer/>

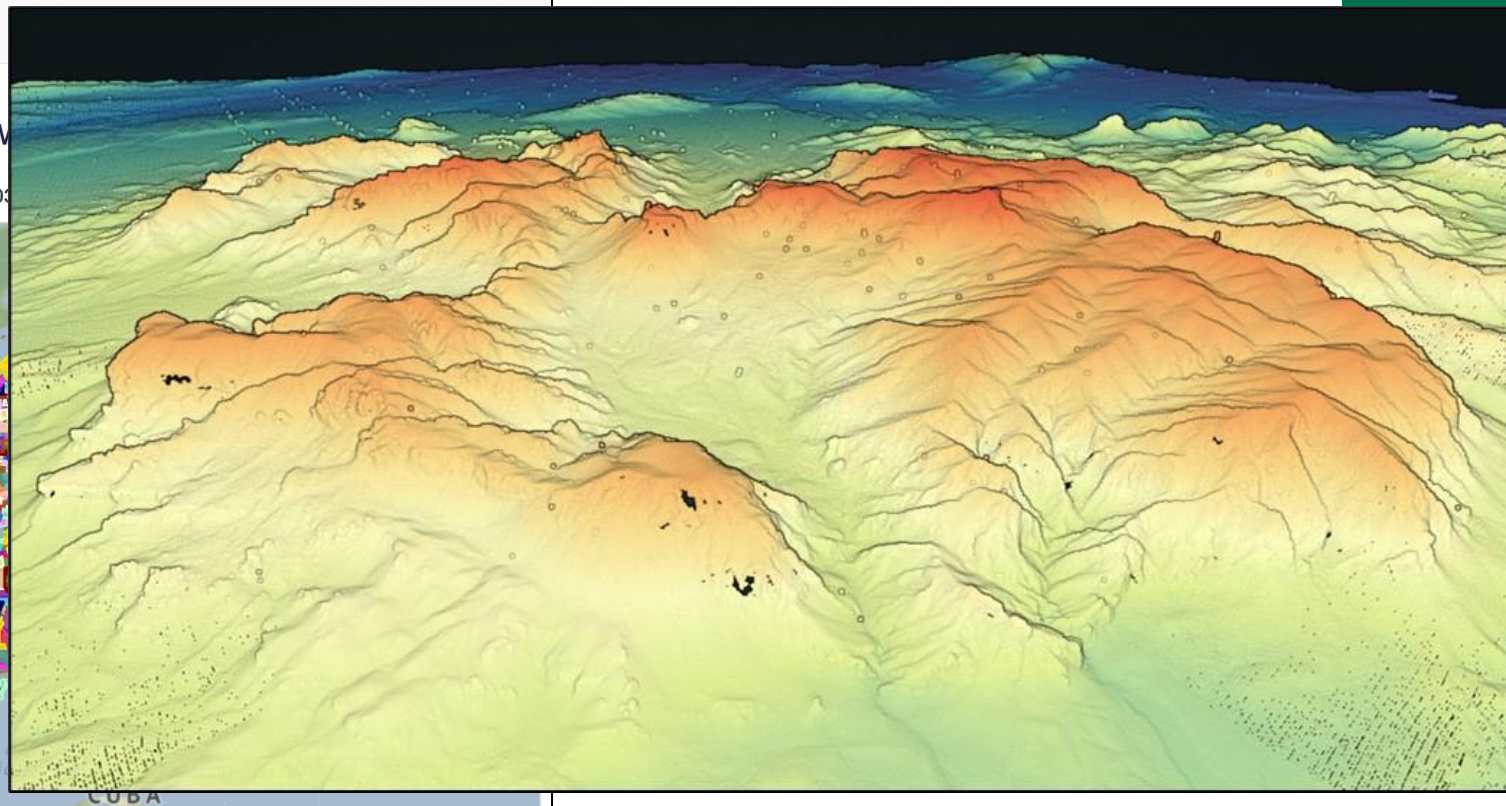
3DEP Point Cloud as Amazon Public Dataset

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



USGS / Entwine

57,118,108,772,956 points in 2,000



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

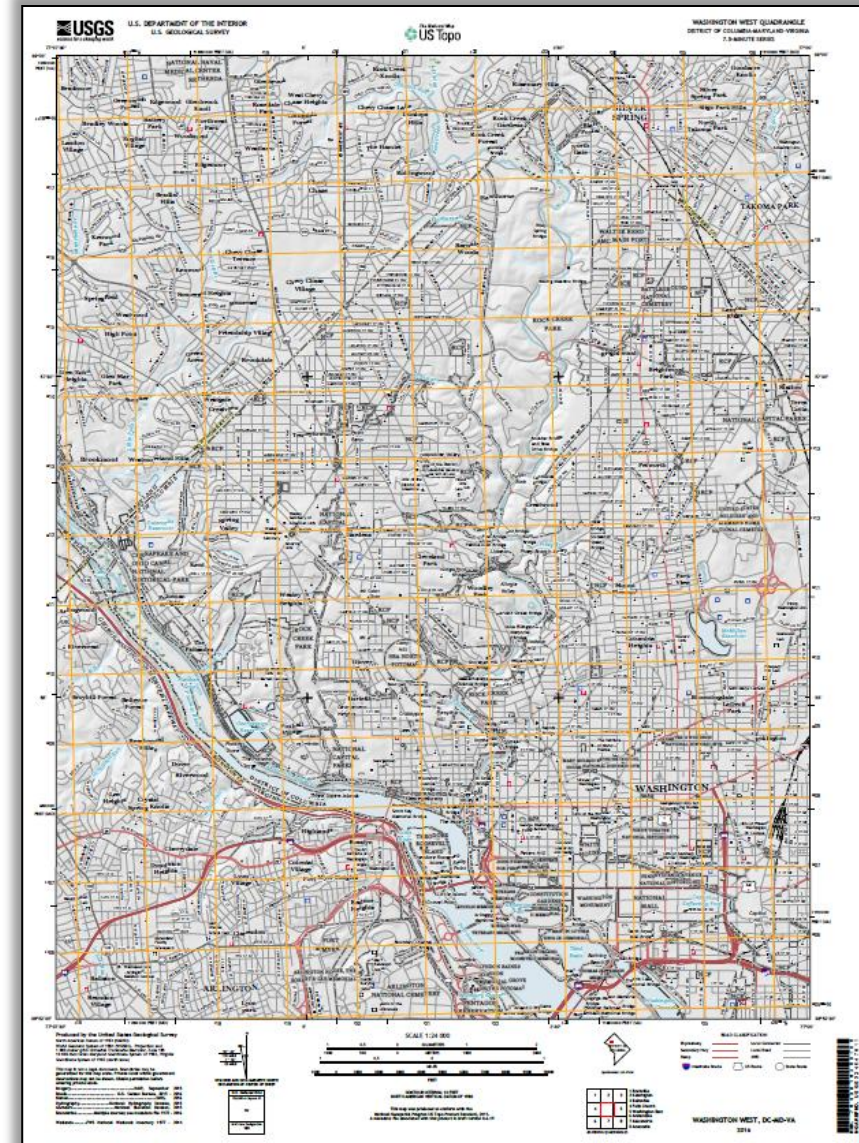
Cartographic Products: US Topo, Historical & topoBuilder

+ 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:

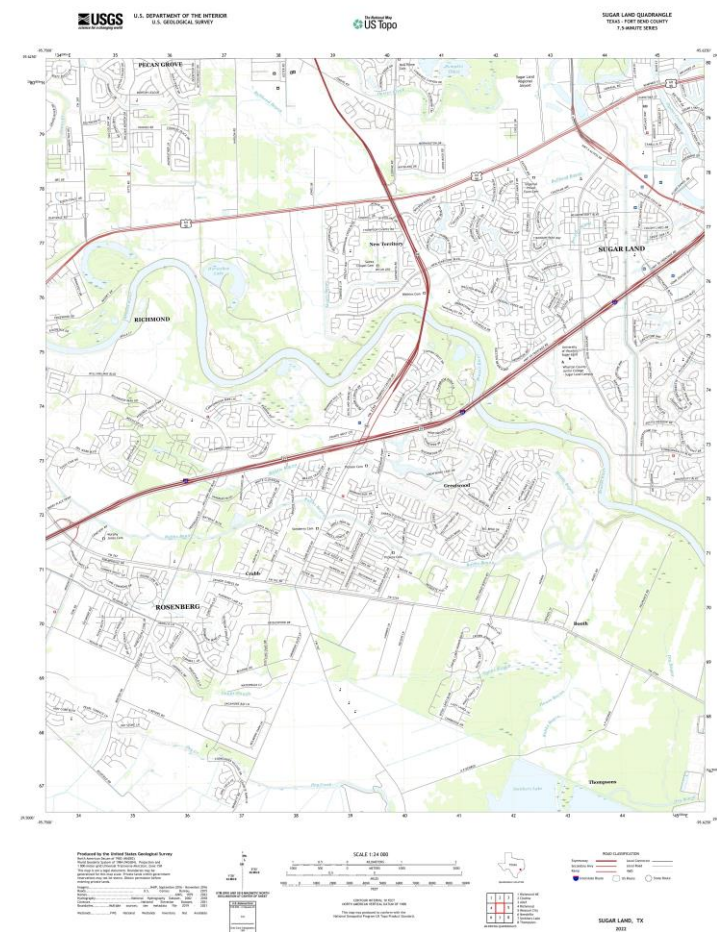
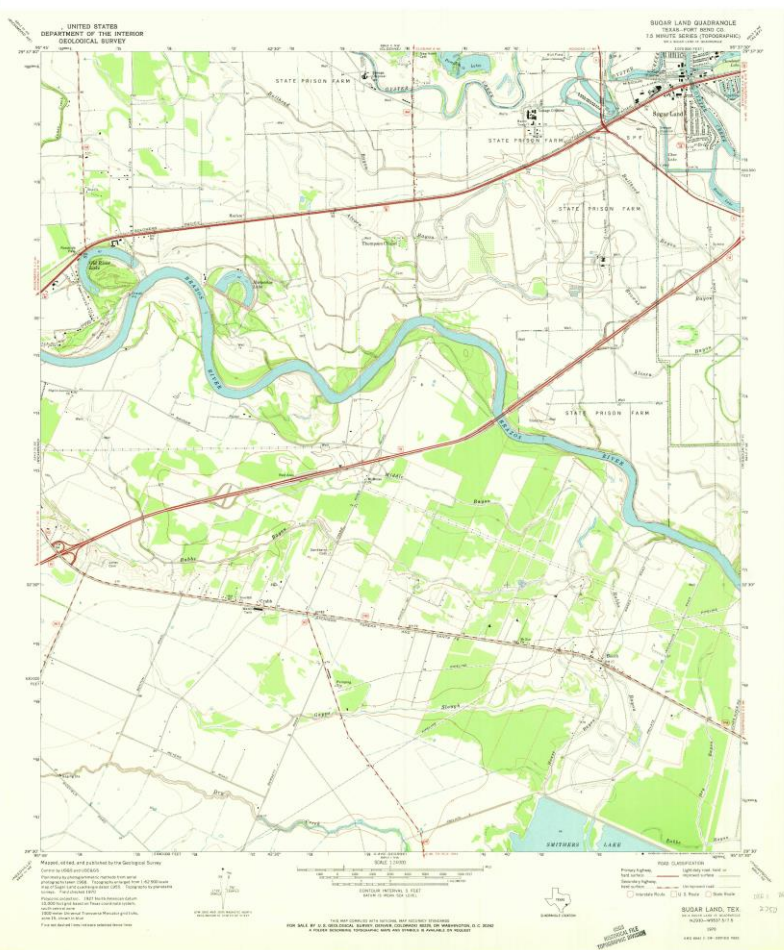
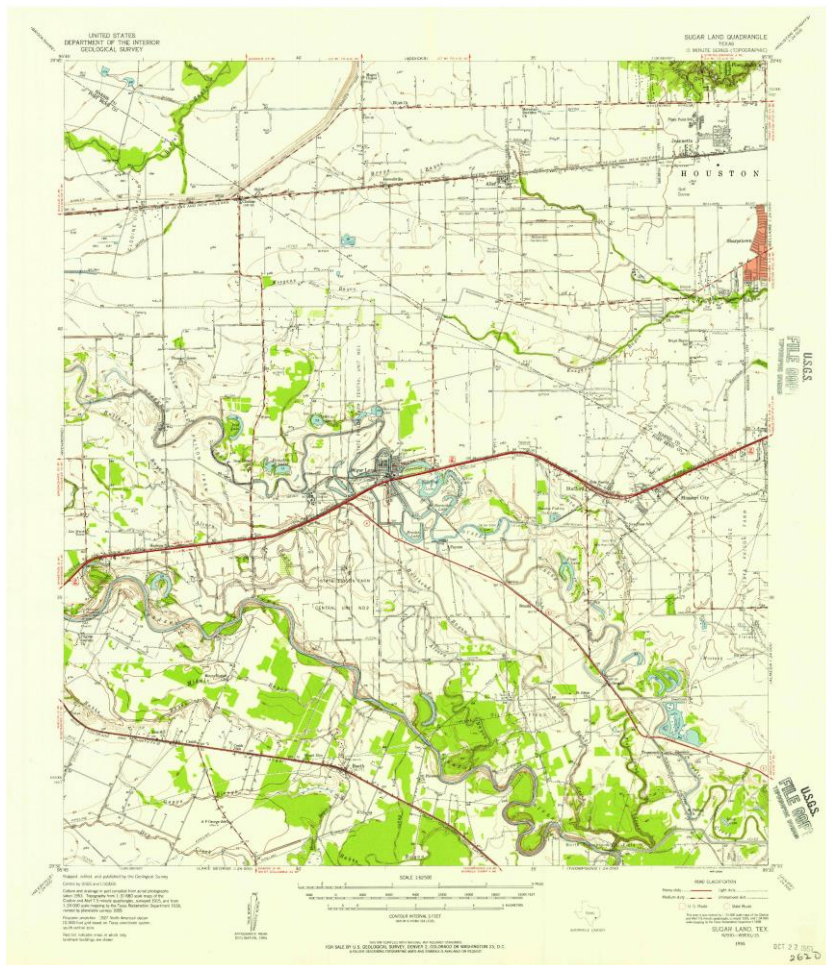
- <https://apps.nationalmap.gov/downloader/>
- USGS Store:
 - <https://store.usgs.gov/>



+ Historical Topographic Map Collection

ngmdb.usgs.gov/topoview/

23



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



science for a changing world



when you want
created on demand



where you want
centered anywhere in
the U.S. and territories



what you want
turn map layers on or off
with Geospatial PDF



The National Map
OnDemand Topo

On-Demand, Custom, Topographic Maps

start making yours at
topobuilder.nationalmap.gov



up-to-date
uses latest available data
from The National Map



fast turnaround
maps processed
within 5 days



delivered to you
download maps from a link
sent to your email

topoBuilder is here to stay!



① Map Types

② Maps

③ Cart 1

Track

? Help



Map Types

Select an OnDemand Topo type, click Next

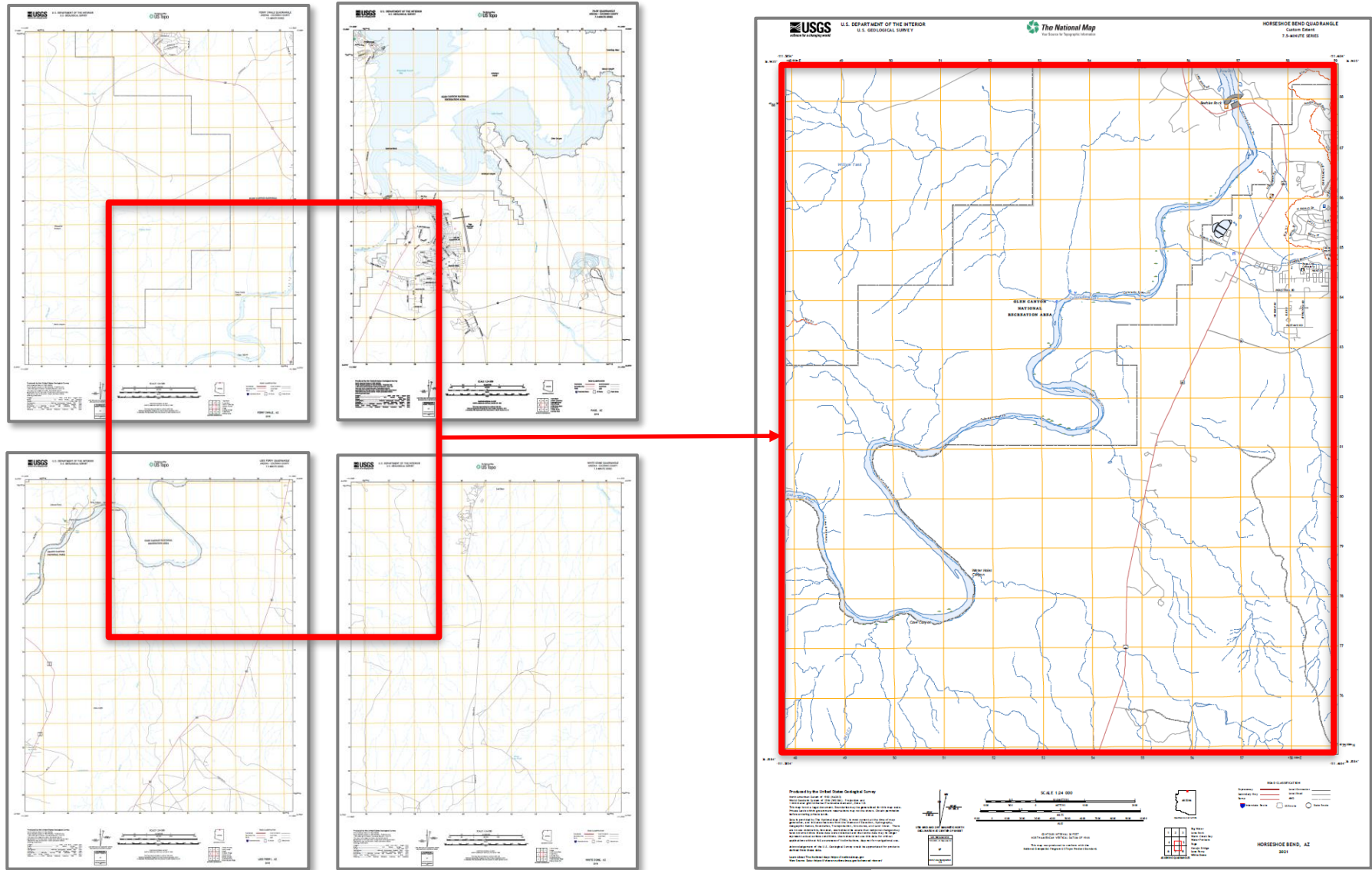


NEXT



+

topoBuilder Deliverable – OnDemand Topo



USGS Educational Resources

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

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

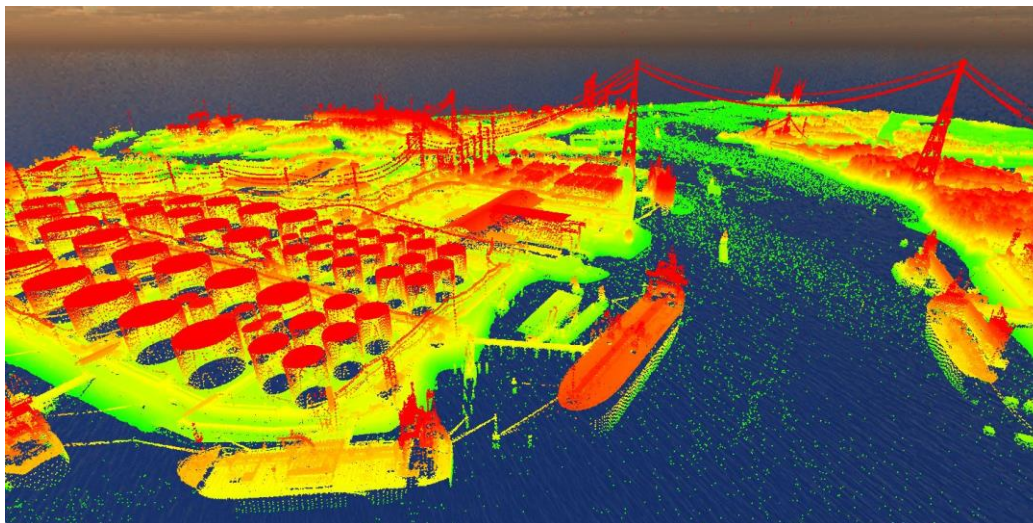


- Youth and Education in Science contact:
usgs_yes@usgs.gov
- Remote Sensing for the classroom
- Geography activities
- General background information for teachers

- 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>