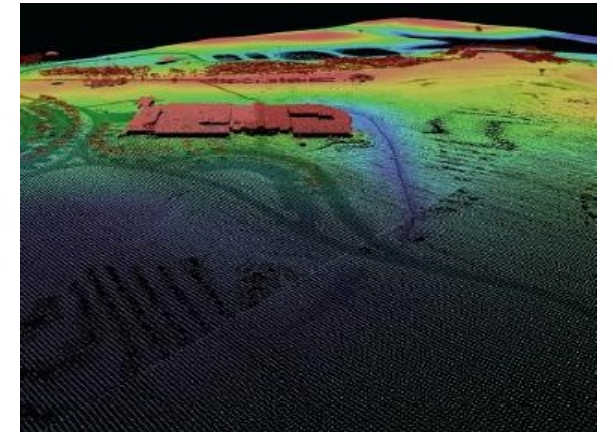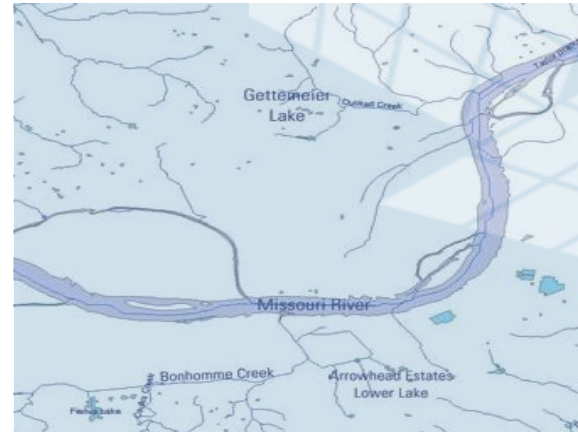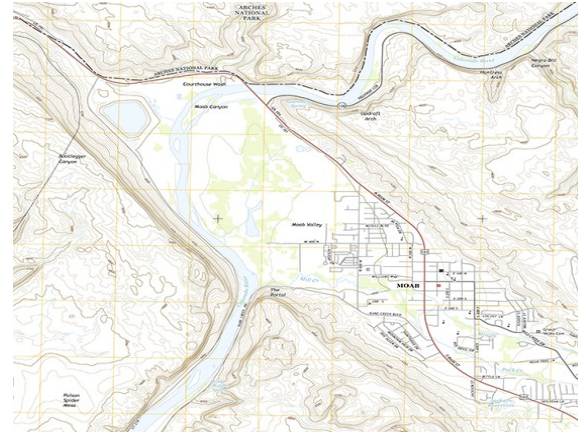# The National Geospatial Technical Operations Center: Products, Services, and Operational Support

USGS science for a changing world

**The National Map** Your Source for Topographic Information

Alaska Geospatial Summit October 2023

Kim Mantey

Director, National Geospatial Technical Operations Center

# National Geospatial Technical Operations Center

- Geospatial Center of Excellence supporting the National Geospatial Program, the civilian mapping agency.

- Extensive collaboration with over 260 partners including 18 Federal agencies and 249 state and local governments for acquisition, management and maintenance of geospatial data.

- An offsite suite of 10 prime contractors with numerous subcontractors under the Geospatial Product and Service Contract (GPSC) provide capacity of geospatial services in support of NGP's national acquisition programs.

- The Center manages over 3.5 Petabytes of geospatial data stored locally and on the cloud.

- Demand for products and services is high with over 462 million hits per month on data download, services, and applications.

- Run the "National Map Corp," a crowdsourcing effort. Over 5,500 volunteers have collected over 412,000 unique map features to contribute to NGP's data holdings.

- The National Map is the comprehensive data source for accessing viewing and downloading geospatial data assets and includes foundational, national data including Hydrography, Elevation, Transportation, Structures, Boundaries and Geographic Names themes.

National Geospatial Technical Operations Center
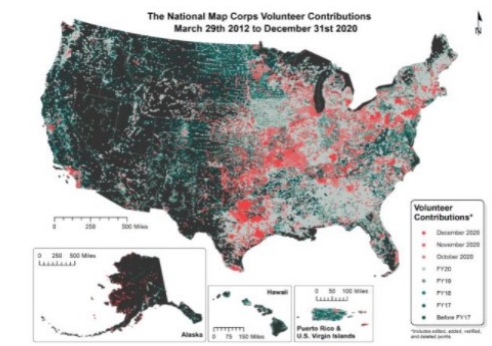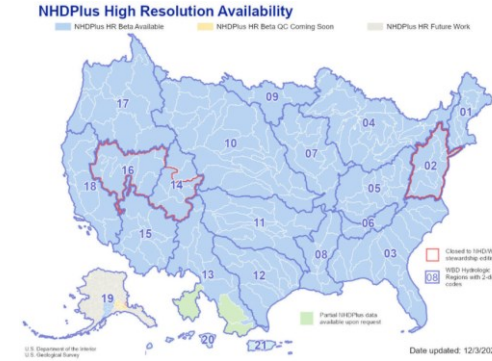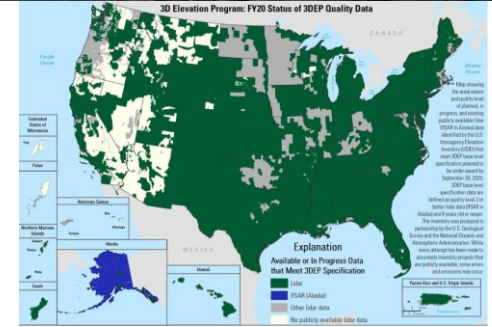
<u>Delivery of nationally consistent, authoritative geospatial data and derived products and services</u>

- ➢ Acquisition of geospatial data (via Federal/state and local partners, contractors, and Center staff)

- ➢ Maintenance and management of national level databases:
  - ➢ Geographic Names, Hydrography, Elevation, and Boundaries, Man-made Structures, and Transportation

- ➢ Data validation and data integration

- ➢ Technical support and training

- ➢ Standards development and maintenance

- ➢ Applied geospatial research

- ➢ Systems and software tool development

- ➢ Data delivery of products/services

- ➢ Research - **C**enter of **E**xcellence for **G**eospatial **I**nformation **S**cience (CEGIS)
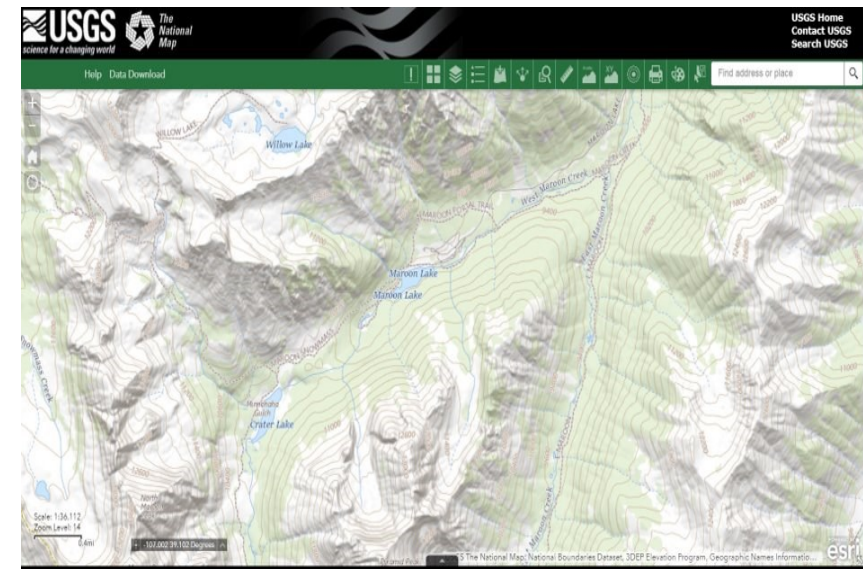
Geospatial Products and Services Contract (4)

- $850M Cap over 5-years, 10 prime contractors (and subcontractors)
- Services to be procured
  - Acquisition of remotely sensed data from multiple platforms
    - Lidar, radar, imagery, electromagnetic and geophysical data
  - High resolution topographic and geophysical data and map products
  - Feature extraction from remote sensing data (hydrography, buildings, etc.)
  - Emergency acquisition and geospatial product generation for disaster response
  - Survey and control services including cadastral surveying
  - Geographic Information Systems (GIS) analysis
  - Validation of provided geospatial data and products

Bureau of Indian Affairs
Bureau of Land Management
DOD - AZ National Guard
Department of Energy
Federal Emergency Management
    Agency
Fish and Wildlife Service
National Geospatial-Intelligence
    Agency
National Oceanic and Atmospheric
    Agency
National Park Service
Natural Resources Conservation
    Service
Tennessee Valley Authority
U.S. Navy
US Army Corps of Engineers
US Bureau of Reclamation
USDA-ARS
US Forest Service
USGS
AK Dept. of Natural Res.
AK North Slope Borough
City of Gustavus
Fairbanks North Star Borough
Golden Valley Electric Authority
Matanuska
Metlakatla
Municipality of Anchorage
Organized Village of Kake
Sealaska
The Nature Conservancy
AL Department of Economic
    and Community Affairs
AL Department of Transportation
Chilton County, AL
Cullman County, AL
Franklin County, AL
Huntsville, City of
Russell County, AL
Town of Thorsby, AL
Tuscaloosa County, AL
Walker County, AL
AR Game and Fish Commission
Northwest AR Regional
    Planning Commission
Pulaski County Area GIS, AR
Coconino County, AZ
Pima Association of Governments, AZ
C A Department of Water Resources

CA Geological Survey
CA Natural Resource Agency
CalFire
City of San Diego OHS, CA
Los Angeles Regional Imagery
    Consortium, CA
San Diego County, CA
San Diego Association of
    Governments, CA
Southwest Wetlands Interpretive Association
City of Montrose, CO
CO Division of Rec and Mining
CO Governor's Office of
    Information Technology
CO Water Conservation Board
Denver International Airport
Garfield County, CO
Gunnison County, CO
Town of Castle Rock, CO
FL Division of Emergency
    Management
State of FL
Martin County Engineering Dept., FL
Northwest Florida Water
    Management District
Osceola County, FL Office of
    Emergency Management
Palm Beach County, FL
Seminole Tribe of Florida
St. Johns River Water
    Management District
Suwannee River Water
    Management District
City of Roswell, GA
GA Coastal Regional Commission
GA Environmental Protection
    Division
GA Mountains Regional
    Commission
IA Department of Agriculture
    and Land Stewardship
Nez Perce County, ID
Cook County, IL
IL Champaign County GIS
    Consortium
IL Department of Natural Resources
IL State Geological Survey
Kane County, IL
Lake County, IL
McHenry County, IL

Marion County GIS, IN
Hamilton County, IN
Wayne County, IN
KS Department of Agriculture
KS GIS Policy Board
KY Commonwealth Office of
    Technology
KY Division of Water
LA Coastal Protection and
    Restoration Authority
LA Department of Transportation
    and Development
Arlington, MA
State of MA
MassGIS
Baxter State Park, ME
Bureau of Parks and Lands, ME
Clayton Lake Woodland Holdings, LLC
Cooperative Forestry Research
    Unit, ME
Drinking Water Commission, ME
King Pine Win, ME
ME Bureau of Parks and Lands
ME Department of Transportation
ME Office of Information
    Technology
Seven Islands Land Company
Washington County, ME
Charlevoix County, MI
Gratiot County, MI Drain
    Commission
Little Traverse Bay Band Odawa
    Indians
The Southeast Michigan Council
    of Governments
State of MI
Boone County MO
Metropolitan St Louis Sewer District
MS Environmental Quality
    Department
NC Department of Transportation
NC Department of Public Safety
NC Floodplain Mapping Program
City of Blair, NE
City of Fremont, NE
City of Lincoln-Lancaster County, NE
City of Omaha, NE
Douglas County, NE
NE Office of the Chief
    Information Officer
Papio Missouri River Natural
    Resources District

Sarpy County, NE
NH Department of Environmental Services
NH Department of Transportation
NJ Department of Environmental
    Protection
DE Valley Regional Planning
    Commission
City of Henderson, NV
City of Las Vegas, NV
Clark County Regional Flood, NV
Clark County Water Reclamation
    District, NV
Clark County, NV
Lyon County, NV
Southern NV Water Authority
Storey County, NV
University of Nevada Reno
Washoe County, NV
City of Buffalo, NY
International Joint Commission (IJC)
NY State Information Technology
    Services
NY State Office of Information
    Technology Services
City of Columbus OH
Clinton County OH
Delaware County OH
Lucas County, OH
Muskingum Watershed Conservancy
    District
OH Department of Administrative
    Services
Sandusky County, OH
Wood County, OH
City of Hillsboro, OR
City of Portland, OR
Coquille Indian Tribe
Metro Regional Gov, OR
OR Department of Geology and Mineral
    Industries
OR Water Enhancement Board Grant
OR Department of Forestry
Umatilla Indian Reservation
City of Allentown, PA
PA Turnpike Commission
PA Department of Environmental
    Protection
PA Department of Transportation
PA Dept of Conservation and Natural
    Resources
PA Emergency Management Agency
Susquehanna River Basin Commission
Tri-County Regional Planning
    Commission, PA
Puerto Rico Planning Board

Aiken County, SC
Anderson County, SC
Beaufort County, SC
Charleston County, SC
City of Aiken, SC
City of Greenville, SC
City of North Augusta, SC
Dorchester County, SC
Jasper County, SC
Lexington County, SC
Newberry County, SC
Pickens County, SC
Richland County, SC
SCANA Public Utility, SC
South Carolina Lidar Consortium
911, TN
Appalachian Electric Co-op, TN
Arlington, TN
City of Bartlett, TN
City of Bristol, TN
City of Kingsport, TN
City of Germantown, TN
Hamilton County, TN
Johnson City Metro
    Transportation
    Planning Organization, TN
City of Lakeland, TN
Memphis Chamber of Commerce
Memphis Light, Gas and Water
City of Memphis, TN
Metropolitan Planning Department
Nashville Davidson County
City of Millington, TN
Morristown-Hamblen GIS Group
Rutherford County, TN
Shelby County, TN
Sullivan County, TN
TN Department of Finance and
    Administration
Town of Collierville, TN
Houston-Galveston Area Council
San Antonio River Authority
TX Commission on Environmental
    Quality
TX Water Development Board
Williamson County
UT Division of Emergency
    Management
UT Geological Survey
UT Forestry, Fire, and State Lands
Moab City, UT
Wasatch Ski Resorts
Tooele Army Depot
Bryce Canyon History
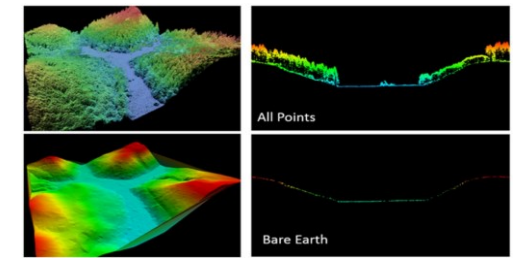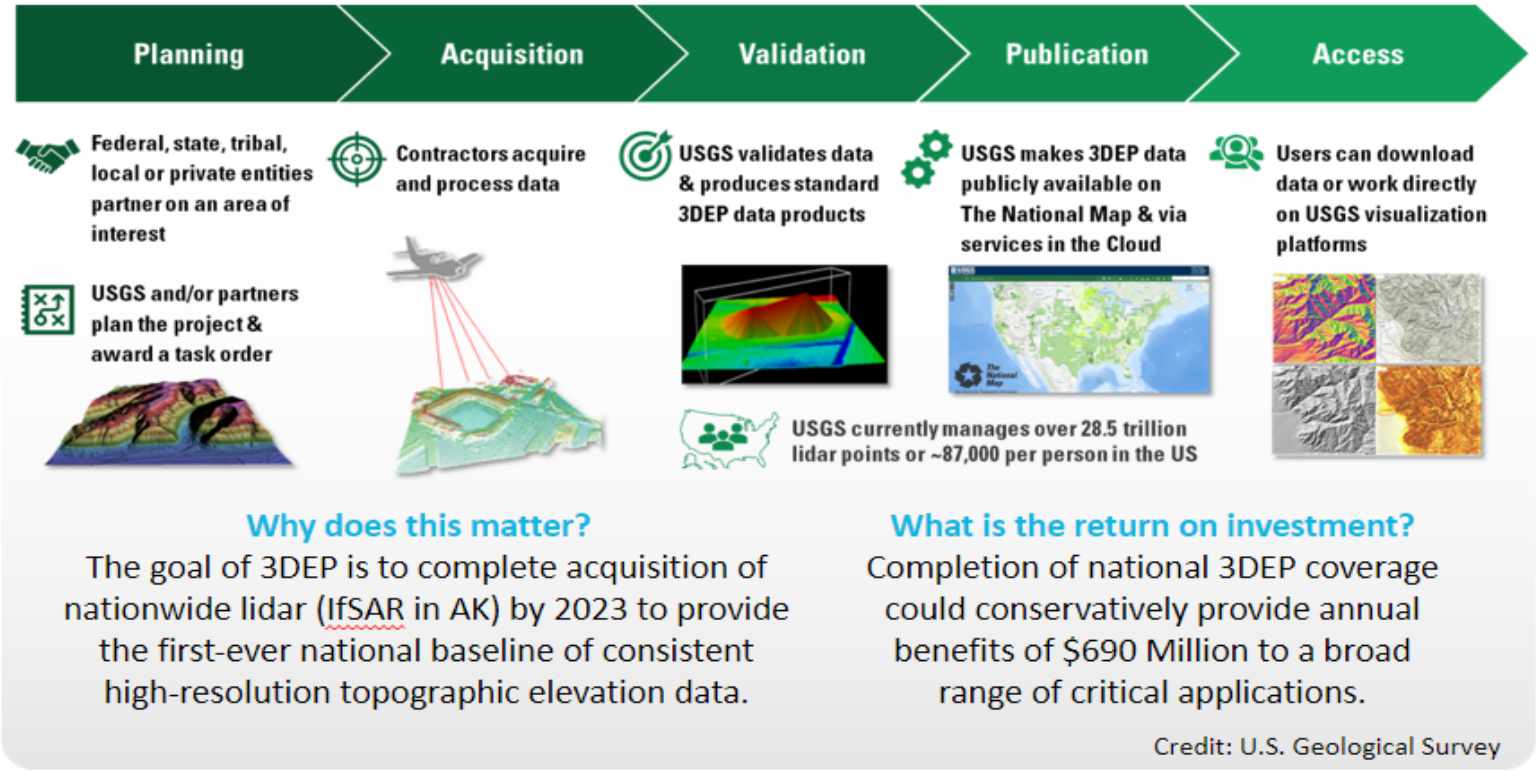Riverdale City, UT
Park City, UT

Mohave County, UT
Bear Lake Watch
City of Tremonton, UT
City of Logan, UT
City of Brigham, UT
Fairfax County, VA
Henrico County, VA
University of Virginia
VA Dept of Environmental Quality
VA Information Technologies
    Agency
City of Williamsburg, VA
VT Agency of Commerce and
    Community Development
Columbia County
WA Dept of Natural Resources
Adams County, WI
Bayfield County, WI
Calumet County, WI
Clark County, WI
Dane County, WI
Dodge County, WI
Fond du Lac County, WI
Forest County, WI
Green Lake County, WI
Jefferson County, WI
La Crosse County, WI
Lafayette County, WI
Langlade County, WI
Lincoln County, WI
Monroe County, WI
Oneida County WI Land
    Information
Pepin County, WI
Portage County, WI
Price County, WI
Sawyer County, WI
Southeastern Wisconsin Regional
    Planning Commission
Taylor County, WI
City of Washburn
Waupaca County, WI
Winnebago County, WI
Wisconsin Coastal Management
    Program
Illinois Height Modernization
    Program
MI Dept of Environmental Quality
MI Department of Technology,
    Management and Budget
Natrona County, WY
Capitol Region Council of
    Governments
County of Hawaii
Waushara County, WI

3D Elevation Program (3DEP)

3D Elevation Program
National Geospatial Program

≥USGS *science for a changing world*

3D Elevation Program (3DEP) Data Lifecycle

Planning → **Acquisition** → **Validation** → **Publication** → **Access**

- Federal, state, tribal, local or private entities partner on an area of interest
- USGS and/or partners plan the project & award a task order

- Contractors acquire and process data

- USGS validates data & produces standard 3DEP data products
- USGS currently manages over 28.5 trillion lidar points or ~87,000 per person in the US

- USGS makes 3DEP data publicly available on The National Map & via services in the Cloud

- Users can download data or work directly on USGS visualization platforms

Why does this matter?
The goal of 3DEP is to complete acquisition of nationwide lidar (IfSAR in AK) by 2023 to provide the first-ever national baseline of consistent high-resolution topographic elevation data.

What is the return on investment?
Completion of national 3DEP coverage could conservatively provide annual benefits of $690 Million to a broad range of critical applications.

Credit: U.S. Geological Survey

≥USGS

- Congressionally mandated to map and provide elevation data for the entire United States
- Over 300 Federal, State and local partners
- Oversee the entire lifecycle of data, from planning to publication
- Multiple active remote sensing technologies
- Has gone from a baseline of QL2 (2 points per square meter) to increased demand to QL1 (8 points per square meter)
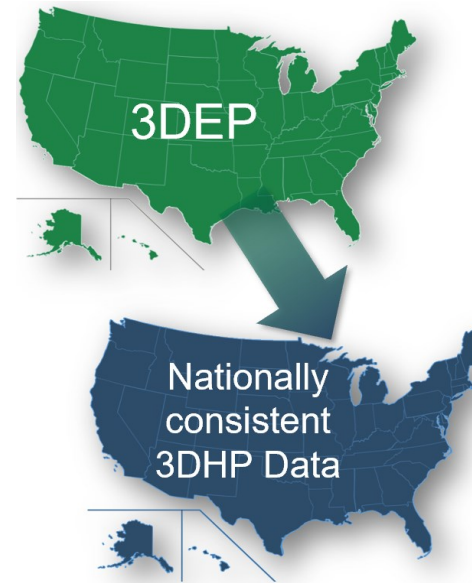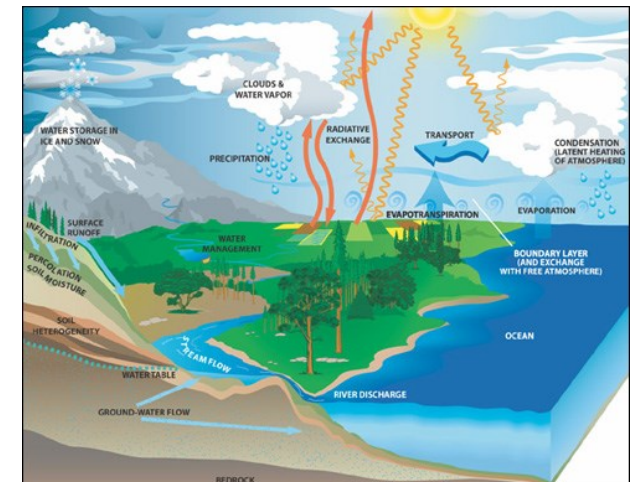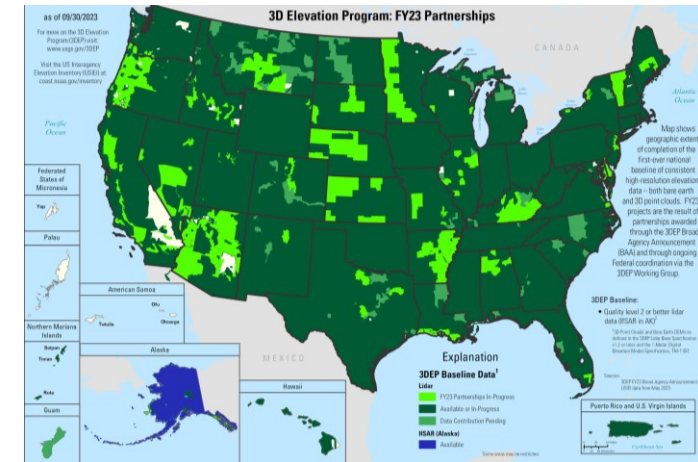
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3D Hydrography Program

Align vertically, horizontally, and temporally with 3D Elevation Program (3DEP) data

- **Replace existing older, inconsistent data with higher accuracy hydrography derived from 3D Elevation Program (3DEP) lidar**

- Follow 3DEP Best Practices
  - Governance
  - Add 3DHP to the 3DEP Data Collaboration Announcement (DCA)
  - Contract 3DHP data through the USGS Geospatial Products and Services Contracts
  - Allow for co-operative data acquisition
  - Specifications and data validation

- **Data and systems built for hydrologic applications**

- Better accounting of the hydrologic cycle through connections to groundwater, U.S. Fish and Wildlife Service National Wetlands Inventory, and engineered hydrography

- Interoperability with other data such as surficial geology, soils, landcover, transportation networks, and other infrastructure
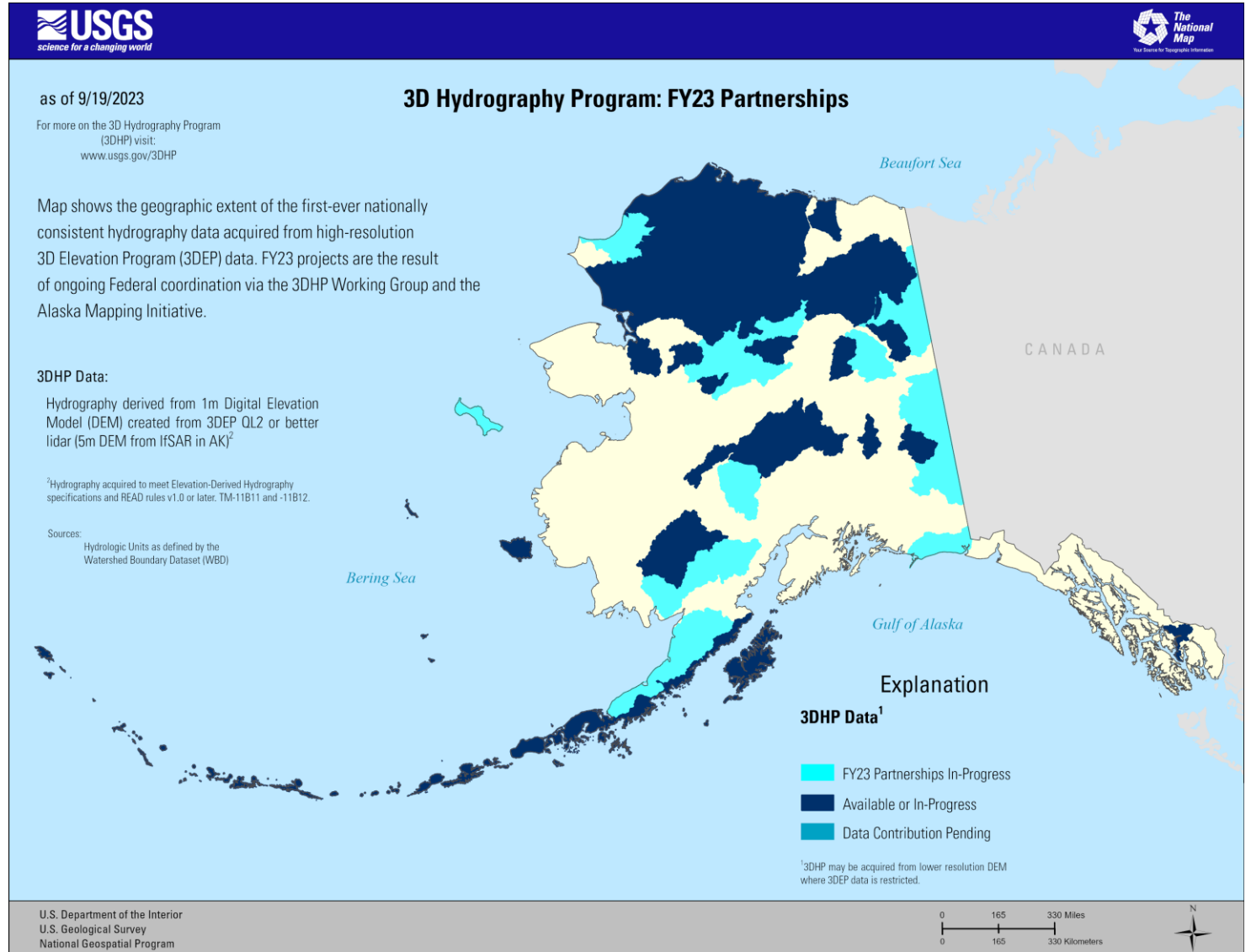
3DEP

Nationally consistent 3DHP Data

3DEP Status – on track to complete nationwide coverage by 2026

- USGS Alaska Mapping funds support ongoing data acquisition - data in progress or planned for over 63 percent of the State
- ~230K sq miles available or in progress through FY22
- 88K sq miles added in FY23
- FY24 projected ~60K sq miles
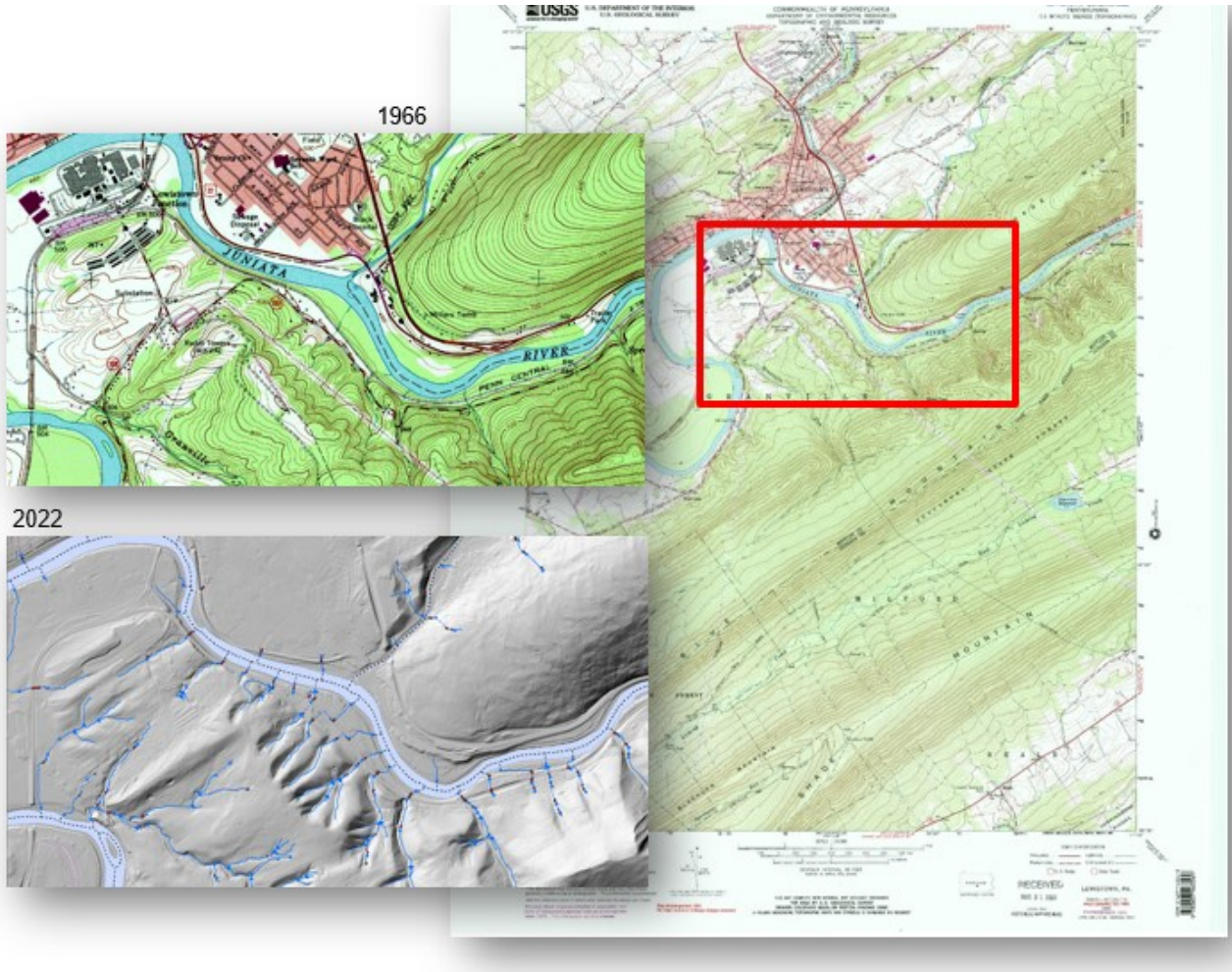
- Three year refresh cycle over entire country – over 18,000 new standard quadrangle maps each year!
  - Maps built from updated source data (elevation, hydrography, transportation, structures, boundaries

- Upcoming fiscal year plans: Over 1,000 updated 7.5 minute quads in Alaska

- Congressional mapping custom congressional district maps

- New products – dynamic mapping

The National Map Delivery

- TNM Delivery System is an enterprise capability that supports all NGP Products and Services.
  - 3DEP, Hydrography, Topographic Mapping, Geographic Names, Transportation, Boundaries, Structures, orthimagery, land cover - over 100 different product types
- Provides: Search, Viewing, Download, Metadata, Web Services, Basemaps Caches, Cloud optimized formats, Notifications about map services, On Demand Elevation Derivatives, Product Availability Indexes
- Future of Delivery:
  - Enhanced use in place to avoid download of very large data
  - Support for bulk delivery and auto-sync to put data on other hosting platforms
  - On Demand Dynamic Topographic Maps
  - Semantic based search at feature level
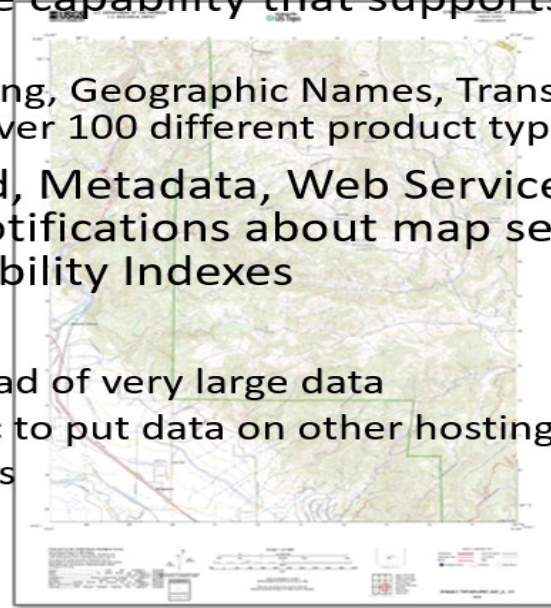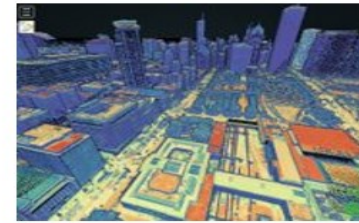
National Geospatial Technical Operations Center

THANK YOU!

https://www.usgs.gov/national-geospatial-technical-operations-center

https://www.usgs.gov/national-geospatial-technical-operations-center/geospatial-products-and-services-contracts

USGS