3D Elevation Program (3DEP) Status and Future

Kevin T. Gallagher
Associate Director, Core Science Systems
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Looking Back - Defining the Nation’s Elevation Strategy

National Enhanced Elevation Assessment (NEEA)

- Prior to 3DEP the National Elevation Dataset provided a patchwork of data collected over nearly a century using evolving technologies, from DEMS processed from hand-drawn contours to QL3 lidar, with data as old as the 1920s in some locations.
- NEEA documented requirements and benefits of 34 Federal agencies, all 50 states, local, Tribal and private entities to define next generation of elevation data.
- USGS evaluated 10 program scenarios and recommended uniform coverage of higher quality data.

![Chart showing annual costs, benefits, and needs satisfied by scenario](chart.png)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Business Use</th>
<th>Conservative</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flood Risk Management</td>
<td>$295M</td>
<td>$502M</td>
</tr>
<tr>
<td>2</td>
<td>Infrastructure and Construction Management</td>
<td>$206M</td>
<td>$942M</td>
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<tr>
<td>3</td>
<td>Natural Resources Conservation</td>
<td>$159M</td>
<td>$335M</td>
</tr>
<tr>
<td>4</td>
<td>Agriculture and Precision Farming</td>
<td>$122M</td>
<td>$2,011M</td>
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<tr>
<td>5</td>
<td>Water Supply and Quality</td>
<td>$85M</td>
<td>$156M</td>
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<tr>
<td>6</td>
<td>Wildfire Management, Planning and Response</td>
<td>$76M</td>
<td>$159M</td>
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<td>7</td>
<td>Geologic Resource Assessment and Hazard Mitigation</td>
<td>$52M</td>
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<td>8</td>
<td>Forest Resources Management</td>
<td>$44M</td>
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<td>9</td>
<td>River and Stream Resource Management</td>
<td>$38M</td>
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<td>10</td>
<td>Aviation Navigation and Safety</td>
<td>$35M</td>
<td>$56M</td>
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<tr>
<td>20</td>
<td>Land Navigation and Safety</td>
<td>$0.2M</td>
<td>$7,125M</td>
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<tr>
<td>Total</td>
<td>for all Business Uses (1 – 27)</td>
<td>$1.2B</td>
<td>$138B</td>
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3D Elevation Program (3DEP) Goal

- Complete acquisition of nationwide lidar (IfSAR in AK) in 8 years to provide the first-ever national baseline of consistent high-resolution elevation data – both bare earth and 3D point clouds – collected in a timeframe of less than a decade
- Address Federal, state and other mission-critical requirements
- Realize ROI 5:1 and potential to generate $13 billion/year
- Leverage the capability and capacity of private mapping firms
- Achieve a 25% cost efficiency gain
- Completely refresh national data holdings

3DEP Status 2023

Plan vetted across the community and published in the 2014 3DEP Call for Action
3DEP Status Including FY18 Partnerships

Data are available or in progress for 53% of the Nation

*includes lidar and AK IfSAR

Data acquisition investments by all partners, by fiscal year

- $0
- $20
- $40
- $60
- $80
- $100
- $120

Millions of Dollars

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment</th>
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<tbody>
<tr>
<td>13</td>
<td>10</td>
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<td>17</td>
<td>60</td>
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<tr>
<td>18</td>
<td>80</td>
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3DEP Goal to Complete Acquisition by 2023

Estimated Funding Gap

- To estimate the funding gap for completing nationwide 3DEP data coverage by 2023, three different partnership scenarios (1:4, 1:2 and 1:1 with Federal lands at 1:1 for all scenarios) were considered and the average is reflected in the bar graph.

- Partner funding has been harder to raise for the western U.S. due to smaller tax bases and the presence of large areas of Federal lands, so we anticipate that completion of remaining areas will be at the lower ratios.

- The estimate includes MANY assumptions and is being refined as we learn more.

http://usgs.gov/3DEP/numbers
Dear Chairwomen Lowey and McCollum and Ranking Members Granger and Joyce,

We write to respectfully request that you provide robust funding for the 3D Elevation Program, a 3DEP, administered by the U.S. Geological Survey (USGS), in the FY 2020 Department of the Interior, Environment, and Related Agencies Appropriations Act.

3DEP will satisfy the growing demand for consistent, high-quality topographic data and a wide range of other three-dimensional representations of the Nation’s natural and constructed features. The USGS has identified more than 600 applications that would benefit from enhanced elevation data. Data procured from 3DEP can be applied to flood risk management, infrastructure, water resources, aviation safety, telecommunications, homeland security, emergency response, precision agriculture, energy, pipeline safety, and other areas. 3DEP will promote economic growth, facilitate resource development and management while enhancing environmental protection, and generally enhance the quality of life of all Americans. In addition, lidar data from 3DEP helps provide the USGS Natural Hazards Program with the best available scientific information and tools to reduce the threat of injuries, fatalities, and economic loss from a variety of natural disasters such as landslides, sinkholes, earthquakes, and volcanoes. The USGS, with involvement from the private sector and other stakeholders, conducted a National Enhanced Elevation Assessment (NEEA), to determine and document the need for national elevation data within government and private markets. The results indicated that enhanced elevation data could have the potential to generate $13 billion in annual benefits, at a benefit-to-cost ratio of 4.7 to 1. The USGS has previously recommended that $146 Million will enable USGS to achieve nationwide coverage of the United States on an 8-year cycle, as originally conceived in the USGS plan for 3DEP.

We are committed to working with my colleagues on both sides of the aisle to do everything we can to maximize the benefits for my constituents and for citizens across the country from the more than 600 public applications and business uses of enhanced elevation data. Thank you for your attention to this request.

Sincerely,

[Signatures of Members of Congress]

Thank You
3DEP Coalition!
Dear Chairman Murkowski and Ranking Member Udall,

As you prepare the Fiscal Year 2020 Interior, Environment, and Related Agencies Appropriations bill, we ask that you provide robust funding for the 3D Elevation Program, or 3DEP, administered by the U.S. Geological Survey (USGS).

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We urge you to provide robust funding for the 3D Elevation Program. Thank you for considering our request.

Sincerely,
3DEP Coalition

Letter to the Interior Subcommittees requesting $146M

Alliance of Crop, Soil, and Environmental Science Societies
American Bankers Association
American Council of Engineering Companies
American Geosciences Institute
American Institute of Professional Geologists
American Petroleum Institute
American Property Casualty Insurance Association
American Public Works Association
American Society for Horticultural Science
American Society of Agronomy
American Society of Civil Engineers
American Society of Farm Managers and Rural Appraisers
American Water Resources Association
American Water Works Association
Association of American State Geologists
Association of Environmental & Engineering Geologists
Association of State Floodplain Managers
Crop Science Society of America
Insurance Institute for Business & Home Safety
International Association of Emergency Managers

International Code Council
Interstate Council on Water Policy
Irrigation Association
Land Improvement Contractors of America
National Agricultural Aviation Association
National Apartment Association
National Association of Development Organizations
National Association of Realtors
National Association of Tower Erectors
National EMS Pilots Association
National Flood Association
National Ground Water Association
National Multifamily Housing Council
National Society of Professional Surveyors
National States Geographic Information Council
National Wildlife Federation
Rural & Agriculture Council of America
Society for Range Management
Soil and Water Conservation Society
Soil Science Society of America
S. 529 National Landslide Reduction Act

Senate Commerce Committee

- Would authorize a national landslides hazards program and a national 3DEP program
- The head of each Federal department and agency involved in the acquisition, production, distribution, or application of 3D elevation data shall—implement policies and procedures for data acquisition and sharing that are consistent with standards and guidelines developed under the 3D Elevation Program; Ensure that any 3D elevation data acquired with Federal grant funding—(I) meets 3D Elevation Program standards; and (II) is included in the national holdings of those data.

- Establishes the 3D Elevation Federal Interagency Coordinating Committee composed of:
  (A) The Secretary, who shall serve as Chairperson of the Committee
  (B) The Secretary of Agriculture
  (C) The Secretary of Commerce
  (D) The Secretary of Homeland Security
  (E) The Director of the National Science Foundation
  (F) The Director of the Office of Science and Technology Policy
  (G) The Director of the Office of Management and Budget
  (H) The head of any other Federal department or agency, at the request of the Secretary

- Establish a subcommittee under National Geospatial Advisory Committee to report and provide recommendations on effectiveness of program and assessment of trends
Earth Mapping Resources Initiative (Earth MRI)

Goal to improve knowledge of the Nation’s geologic framework and to identify areas of potential undiscovered critical mineral resources to decrease our reliance on foreign mineral sources

Leverage existing programs to collect data on the highest priority regions:

- Cooperative agreements with State geological surveys for new geologic mapping and data preservation
- Contracts with private industry to conduct geophysical and lidar surveys
- 3DEP partnerships under the Broad Agency Announcement
- In FY19, focus on areas potentially containing rare earth element mineral deposits
3DEP Future Generation Just Around the Corner
3D Nation Elevation Requirements and Benefits Study

- Working with NOAA to understand inland, nearshore and offshore bathymetric data requirements and benefits
- Plan for the next round of 3DEP when the first-ever national baseline of consistent high-resolution data is in place – what is needed for monitoring, change detection and other new applications?
- Gather technology-agnostic user information to be able to assess new technologies against requirements and identify the tradeoffs between different approaches
- Results will lead to a completely new approach regarding QLs, refresh frequency by geography, products offered, and other changes
Study Phases and Timeline

**Information Gathering Phase**

- **Study Preparation** (7 months)
  - Study Design
  - Questionnaire Development
  - OMB Approval
  - Study Dates: 9/2017 – 3/2018

- **Initial Data Collection** (8 months)
  - Identify Fed POCs/State Champions
  - Questionnaire Open
  - Summary Reports for Validation Phase
  - Questionnaire Dates: 1/2018 – 9/2018

- **Data Validation** (8 months)
  - Conduct Validation Meetings
  - Validate Results (Reports & Geodatabase)
  - Data Validation Dates: 9/2018 – 5/2019

- **Aggregate/Report** (6 months)
  - Aggregate Benefits by Business Use
  - Final Report & Geodatabase

- **Analysis/Development** (7 months)
  - Develop Program Scenarios
  - Analyze Benefit/Cost and ROI
  - Determine Program Direction

**Follow on Study Tasks**

- 2017
- 2018
- 2019
3DEP Future Generation Just Around the Corner
Potential multi-modal approach
THANK YOU!

Zion National Park, UT

3D Elevation Program (3DEP)