

3D Elevation Program

NGAC Update

Vicki Lukas

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The National Map

+ What is the 3D Elevation Program?

3DEP is a call for community action to...

- Accelerate the acquisition of high quality light detection and ranging (lidar) data in the conterminous U.S., Hawaii, and the U.S. Territories; and interferometric synthetic aperture radar (ifsar) data in Alaska
- Increase the overall investment in 3D elevation from about \$50 million to \$146 million annually to return more than \$690 million annually in new benefits
- Leverage collaboration among federal, states, local and tribal partners to systematically complete national 3D elevation data coverage in eight years



Natural Resource
Conservation



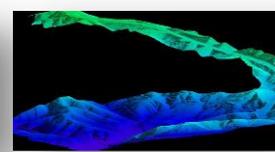
Infrastructure
Management



Flood Risk Mitigation



Precision Farming

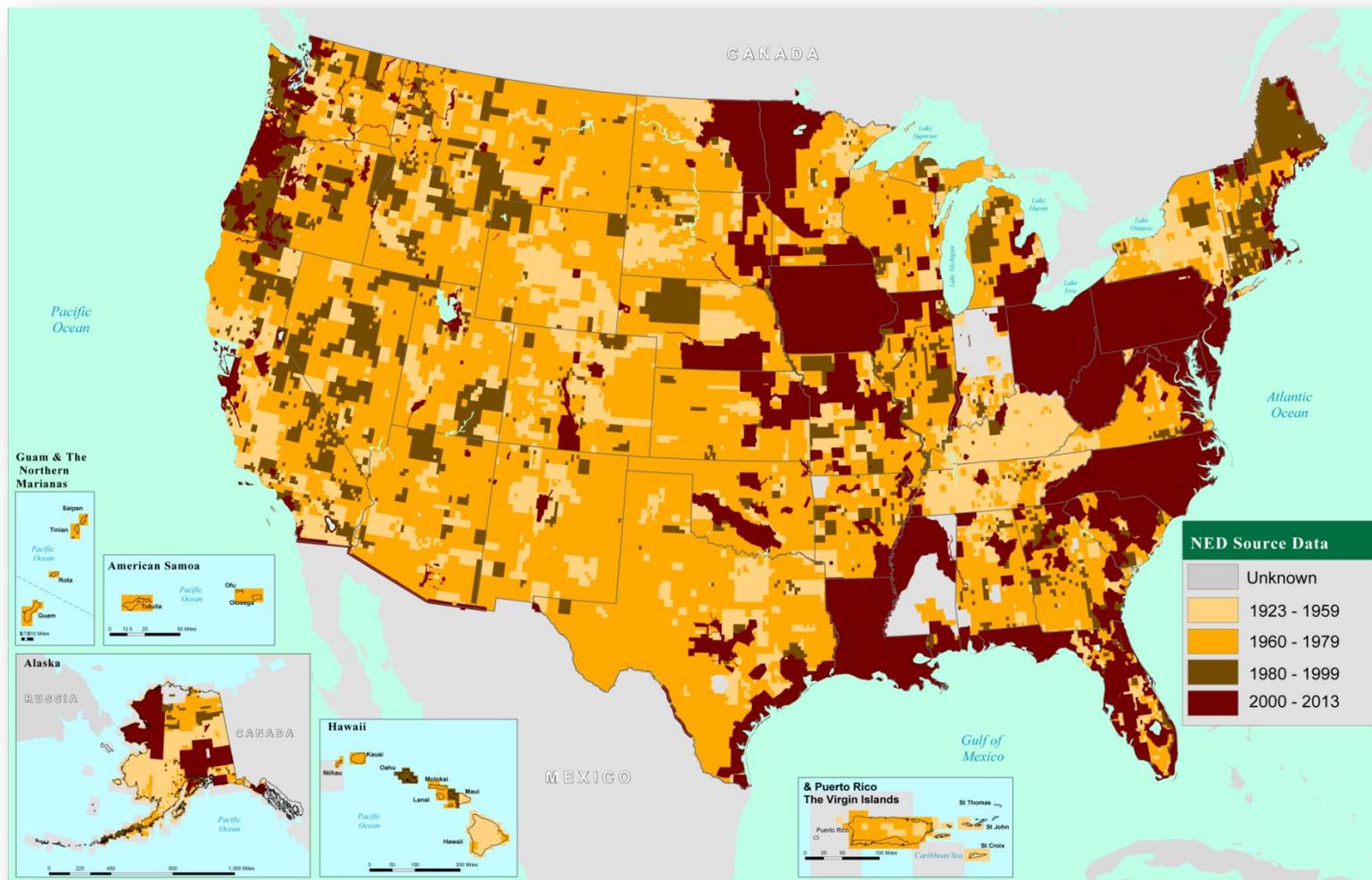


Land Navigation
and Safety



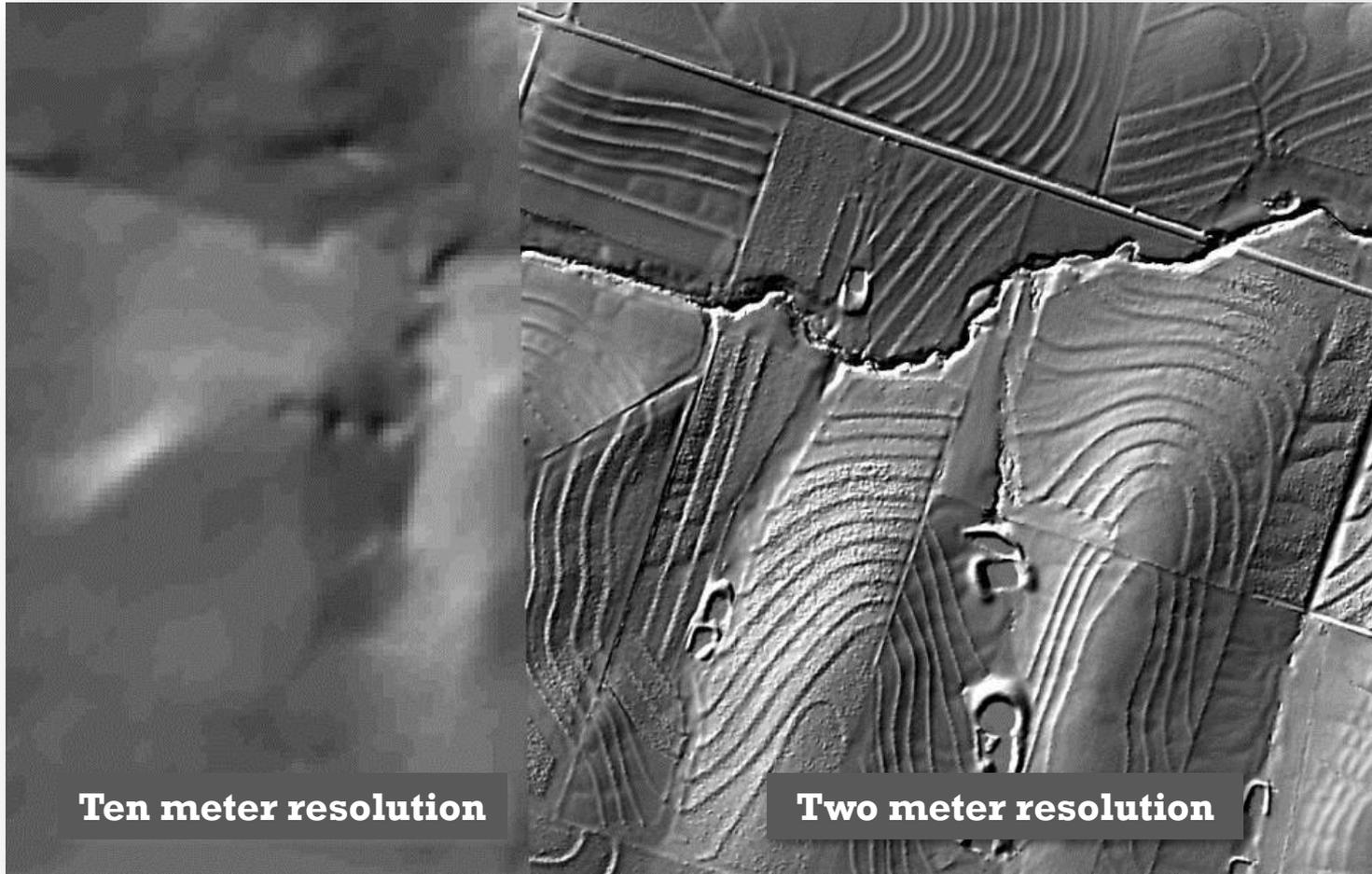
Geologic Resources
and Hazards Mitigation

+ The National Elevation Dataset Status



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Lidar Improves Data Quality

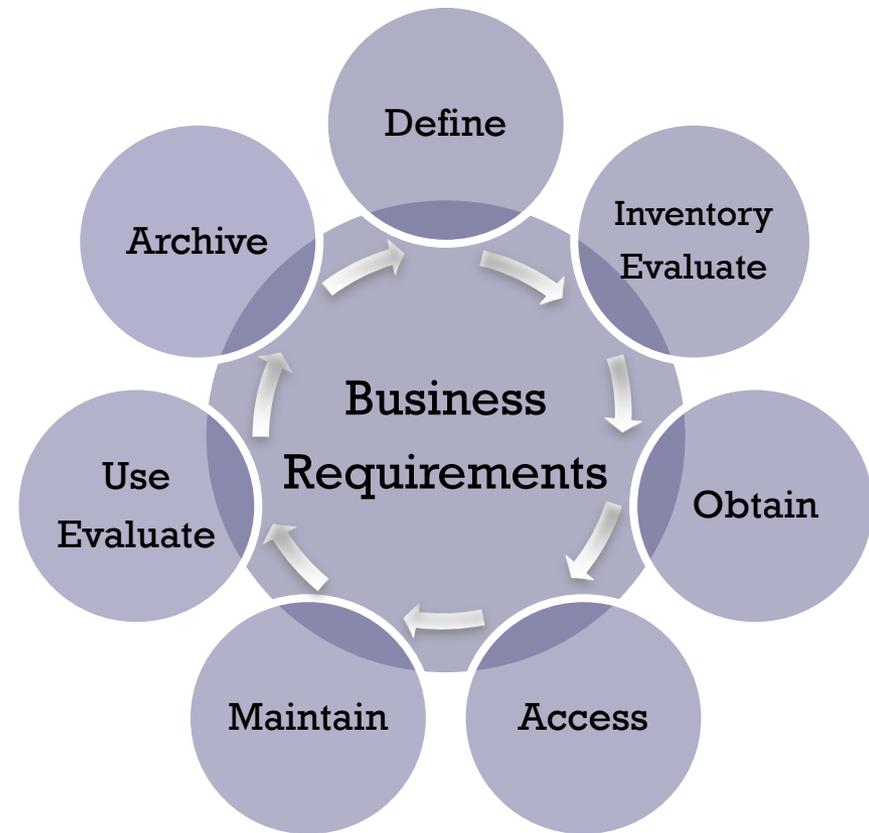


Courtesy of NRCS

+ USGS Lead Agency for Terrestrial Elevation

Office of Management and Budget, Circular A-16 Guidance

- For more than 15 years, the USGS has managed the National Elevation Dataset (NED) and coordinated acquisition through the National Digital Elevation Program (NDEP) on a project-by-project basis
- The National Enhanced Elevation Assessment (NEEA) was conducted to understand and document the needs and benefits of lidar and ifsar data to define the next generation national elevation program



Geospatial Data Lifecycle

+ 3DEP: The Next Generation

3DEP is designed to...

- Address the mission-critical requirements of 34 Federal agencies, 50 states, and a sampling of local governments, tribes, private and not-for profit organizations documented in the National Enhanced Elevation Assessment
- Increase the quality level of lidar data being acquired to meet 58% of the documented needs instead of the 10% of needs being met with lower quality data
- Achieve a 25 percent cost efficiency gain by collecting data in larger projects
- Provide more consistent data through standardized data specifications
- Completely refresh the National Elevation Dataset (NED) with new lidar and ifsar elevation data products and services

+ 3D Elevation Program

Quality Levels – A New “Floor”

Quality Level	Source	Vertical Accuracy RMSEz	Nominal Pulse Spacing (NPS)	Nominal Pulse Density (NPD)	DEM Post Spacing
QL1	Lidar	10 cm	0.35 m	8 points/sq. meter	1 meter
QL2	Lidar	10 cm	0.7 m	2 points/sq. meter	1 meter
QL3	Lidar	20 cm	2.0 m	0.7 points/sq. meter	3 meters
QL4	Imagery	139 cm	5 m	0.04 points/sq. meter	5 meters
QL5	Ifsar	185 cm	5 m	0.04 points/sq. meter	5 meters



3DEP



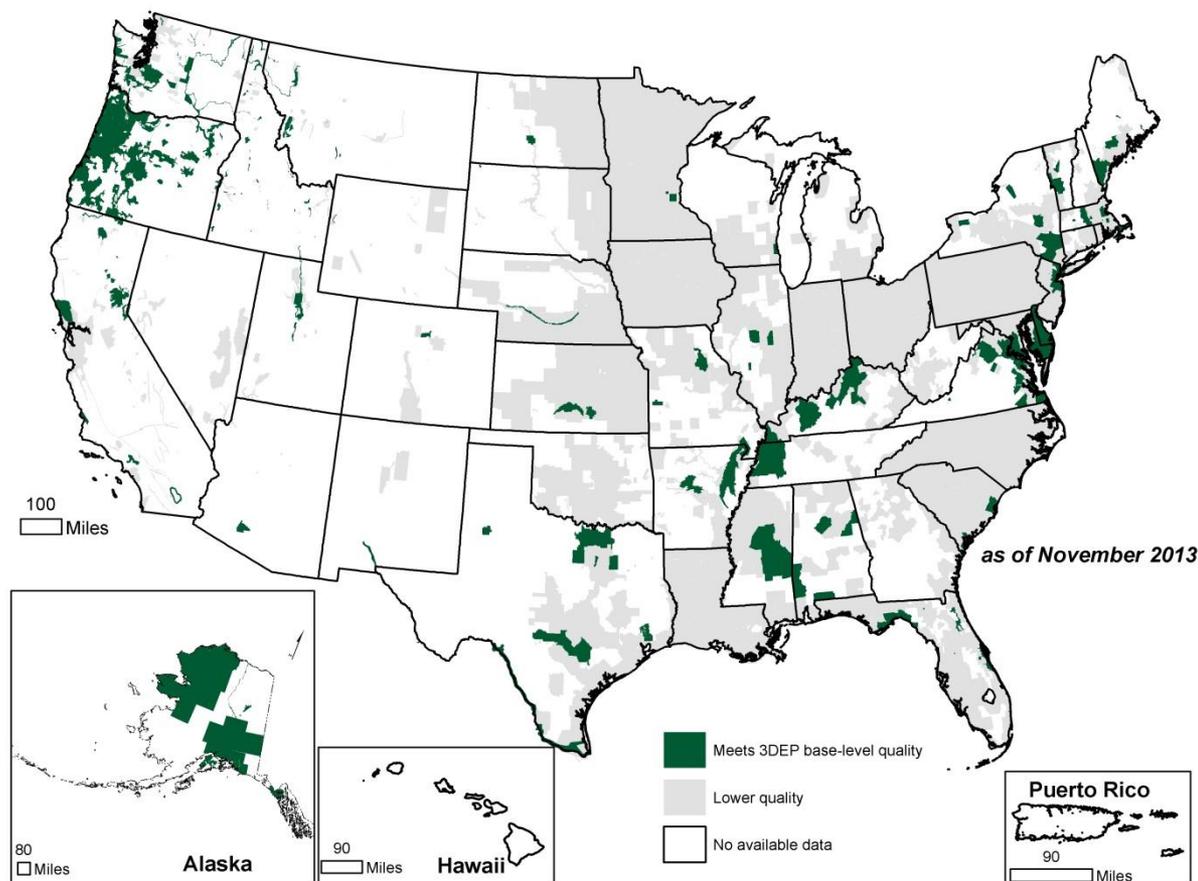
Before
3DEP



3DEP
Alaska

+ U.S. Interagency Elevation Inventory

2013 Status Map of Publicly Available Lidar and Ifsar



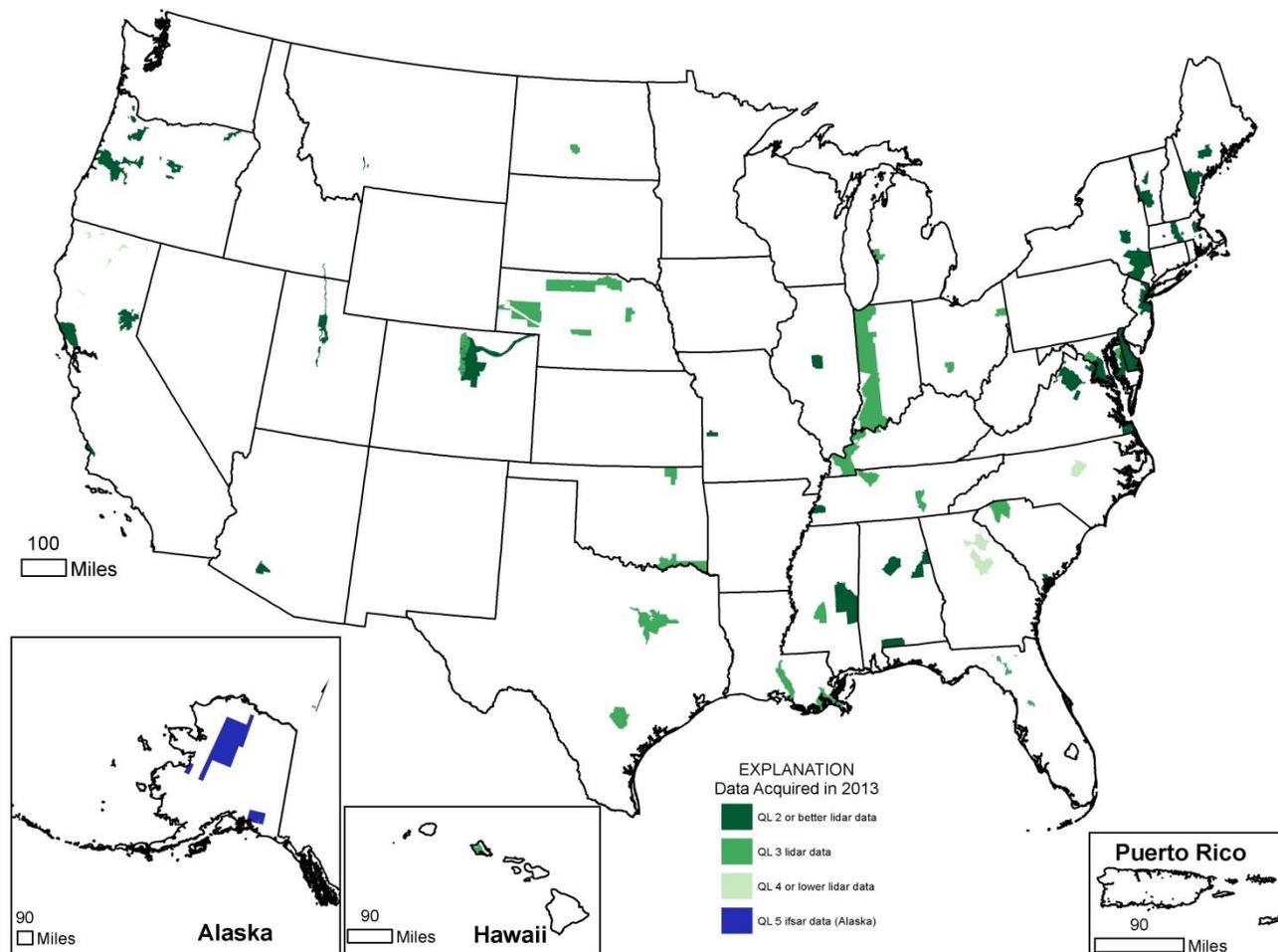
- **Only 4% of the lower 49 states meets the 3DEP quality goal (QL2 or better) lidar coverage**
- **More than half the State of Alaska needs ifsar data to complete the 3DEP goal for coverage**



U.S. Interagency Elevation Inventory

Data acquired in 2013 – All Publicly Available Sources

- **About 3% of the nation** was acquired (includes all QLs)
- **Need to acquire 12% each year** at QL2 or higher (QL5 in AK) to meet 3DEP national coverage goals



+ Program Modernization to Support 3DEP

- **New 3DEP products and services** - 1m digital elevation models (5m for AK), lidar point cloud and other source data; next round being determined in FY15
- **3DEP initiative plan and annual report** – in publication
- **U.S. Interagency Elevation Inventory for FY14** – near completion
- **Specification**
 - Version 1.1 to be completed in 2014 to define specifications for QL2 and QL1 data
 - Version 2.0 will be released in FY15 and will be the "total" 3DEP specification

+ 3DEP Executive Forum

Governance and Executive Outreach

- **Purpose** - to facilitate executive dialog and collaboration on strategies to implement and sustain 3DEP for the benefit of all its stakeholders
- **Leadership** – USGS Associate Director for Core Science Systems, Chair
- **Objectives**
 - Monitor status, plans and coordination actions for 3DEP implementation
 - Strategize on significant developments regarding elevation or related geospatial activities
 - Share insights and develop strategies to communicate with industry and other stakeholder groups that could play a role in 3DEP funding
 - Provide executive direction and input to NDEP as the operational coordinating body
- **Upcoming topic:** emerging lidar technology

+ 3DEP Data Acquisition Process

Begin in FY15

- **Solicit annual and multi-year priorities via NDEP** – from federal agencies to form joint projections; publish on 3DEP website
- **Provide outreach to states** – on state plans and acquisition process as it is determined
- **Define a mechanism to for receiving partnership proposals**
- **Evaluate contributions of data** - Another avenue for agencies to contribute to 3DEP is to provide data that meet 3DEP specifications to the national database – define and document a process in FY15
- **Use USGS funding to:**
 - Increase leveraging
 - Increase project size and economy of scale
 - Move towards more standardized partnership percentages and project parameters

+ 3DEP Budget Outlook

USGS Component – FY14

- FY14 President's Budget – USGS 3DEP increase of \$9M plus \$1M for Alaska ifsar
- Omnibus resulted in \$760K increase for Alaska and \$1M in CMG for Coastal National Elevation Dataset (CoNED)
 - \$2.7M NGP funding for lidar acquisition leveraged through partnerships at nearly 6:1 resulting in approximately \$16M and over 56,000 square miles of new lidar coverage
 - Added over 50,000 square miles of contributed lidar data
 - Continued data acquisition in the Hurricane Sandy Impact Area (over \$7M in FY13/14)
 - Alaska ifsar funding of approximately \$2.4M

+ 3DEP Budget Outlook

USGS Component – FY15 President's Budget

- FY15 President's Budget
 - 3DEP \$5M (lidar)
 - Ecosystems: Columbia River \$350K and Puget Sound \$450K (lidar)
 - Alaska Mapping \$236K (ifsar)

- NGP base level + FY15 increases =
 - \$8.5M for lidar data acquisition
 - Funding will continue to be leveraged; assuming FY14 ratio, total dollars for lidar acquisition potentially \$50M

- NGP base funding + FY15 Alaska increase = \$2.6M for ifsar

+ 3DEP Budget Outlook

USGS Component



■ Endorsements and letters of budget support

- American Association of State Geologists (AASG)
- American Association of Photogrammetry and Remote Sensing (ASPRS)
- Association of State Floodplain Managers
- Coalition of Geospatial Organizations (COGO)
- Management Association of Private Photogrammetric Surveyors (MAPPS)
- National Geospatial Advisory Council (NGAC)
- National Society of Professional Surveyors (NSPS)
- National States Geographic Information Council (NSGIC)

■ The National Academy of Public Administration (NAPA) report “FEMA Flood Mapping: Enhancing Coordination to Maximize Performance” (Nov. 2013) included the following recommendation:

“The Office of Management and Budget should use the 3DEP implementation plan for nationwide elevation data collection to guide the development of the President’s annual budget request.”

■ Congressional Outreach – July 25 Congressional briefing, courtesy visits starting in fall

+ Discussion

