

Idaho Geospatial Council- Executive Committee (IGC-EC)

July 26, 2017

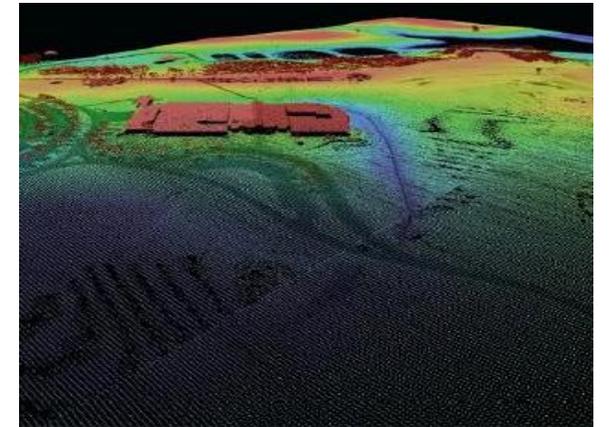
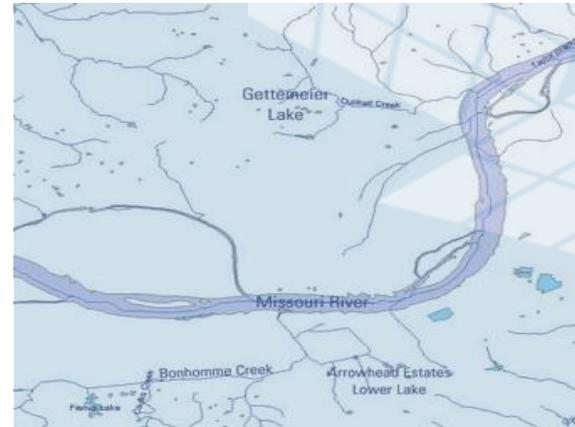
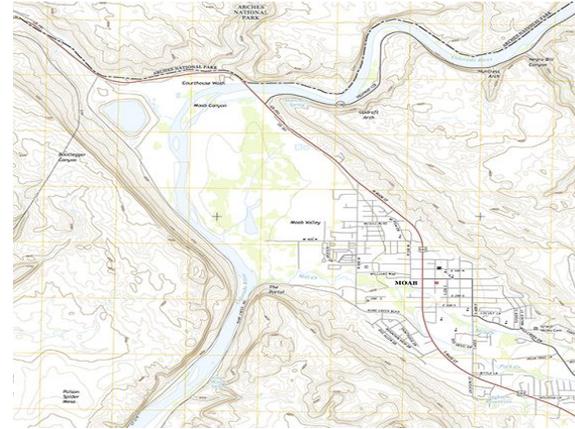
Minutes

- *May 16, 2017*





USGS Geospatial Updates



Tom Carlson

USGS Geospatial Liaison for Idaho, Oregon and Washington

Office: 934 Broadway, Suite 300 Tacoma WA 98402

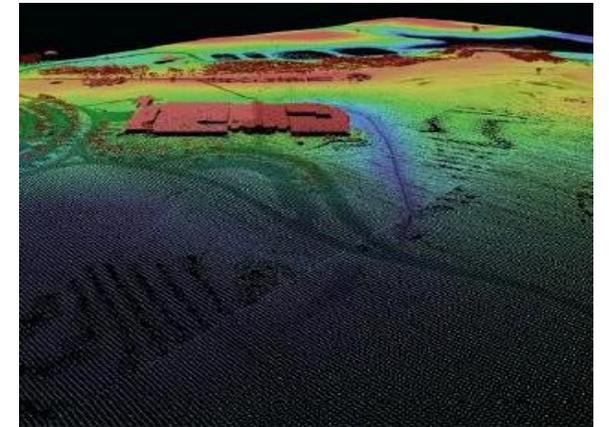
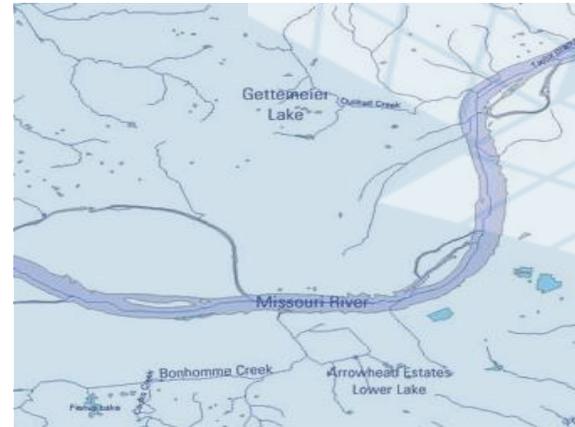
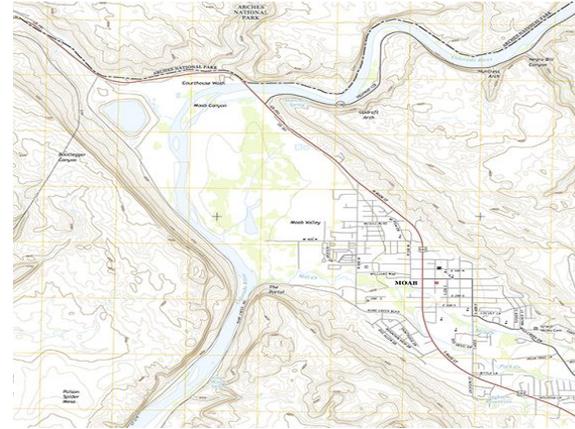
tcarlson@usgs.gov

7.25.2017 IGC meeting





- Idaho 3DEP project
- 3DEP Timeline
- 3DEP/BAA Webinars
- NEEA Survey
- State Lidar Plans-NSGIC
- web links



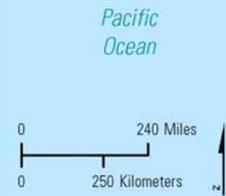


As of 11/09/2016

3D Elevation Program - FY16 Partnerships

For more on the 3D Elevation Program (3DEP) visit: <http://www.nationalmap.gov/3DEP>

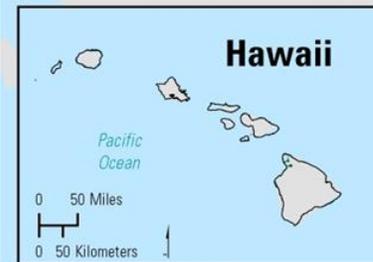
Visit the US Interagency Elevation Inventory (USIEI) at: <http://coast.noaa.gov/inventory/>



Sources:
3DEP FY15/16 Broad Agency Announcement
USIEI data from October 2016



U.S. Department of Interior
U.S. Geological Survey



EXPLANATION

In Progress and Existing Data that Meet 3DEP Specification

- FY16 partnership projects
- lidar
- ifsar (Alaska)

Map shows geographic extent of existing and on-going data acquisition projects that meet current 3DEP Specifications. FY16 projects are the result of partnership projects awarded through the FY16 3D Elevation Program (3DEP) Broad Agency Announcement (BAA) and through ongoing Federal coordination via the 3DEP Working Group (rechartered NDEP) as of Oct 2016.

3DEP Specifications:

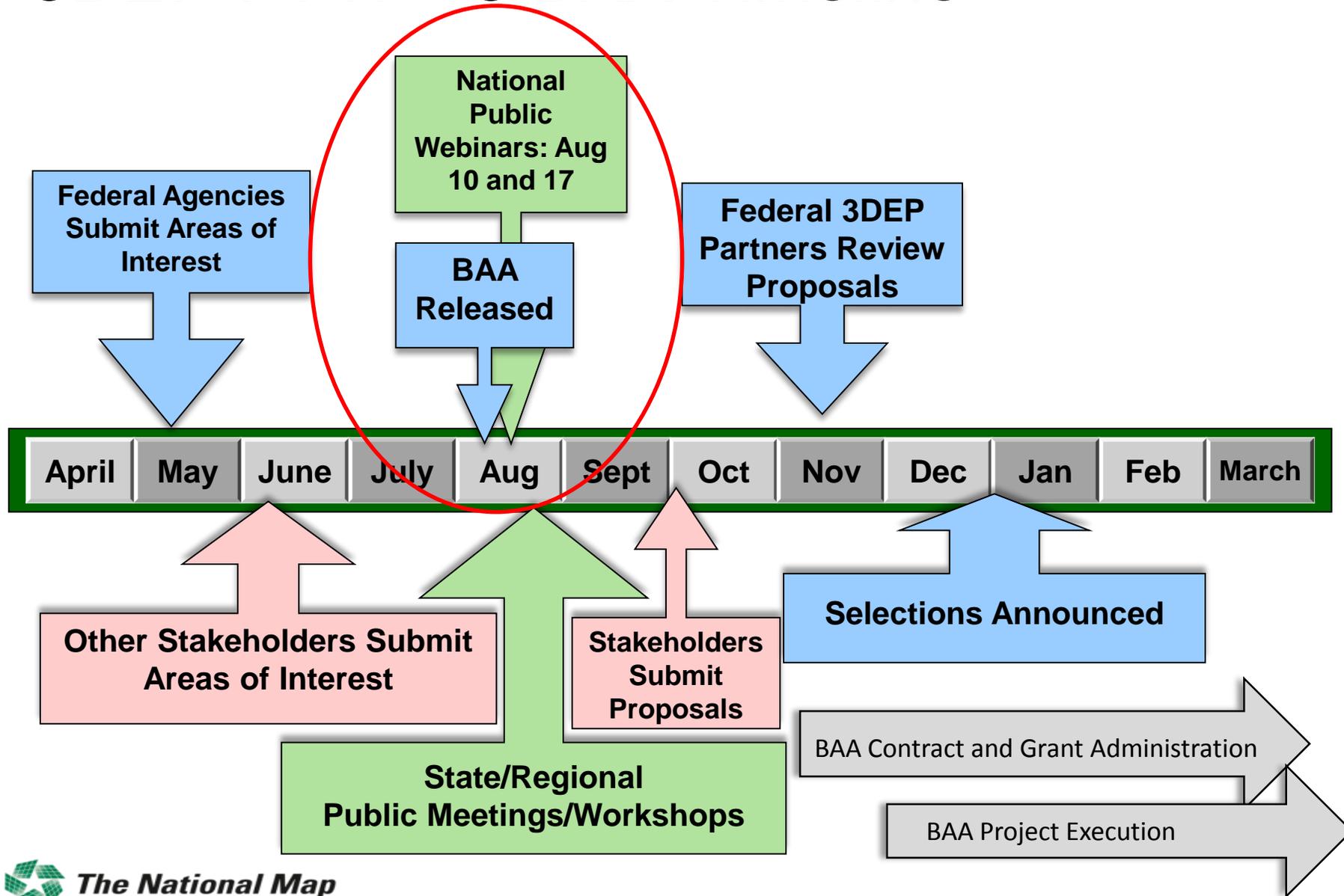
- Quality level 2 or better lidar data (ifsar in AK)²
- Publicly available
- 8 years old or newer as of 2016

²as defined in USGS Lidar Base Specification v1.2



6.7% of the lower 49 and territories added in FY16

3DEP FY17-18 BAA Timeline





3DEP Webinar Registration



USGS Broad Agency Announcement (BAA) for 3DEP FY17 National Webinars:

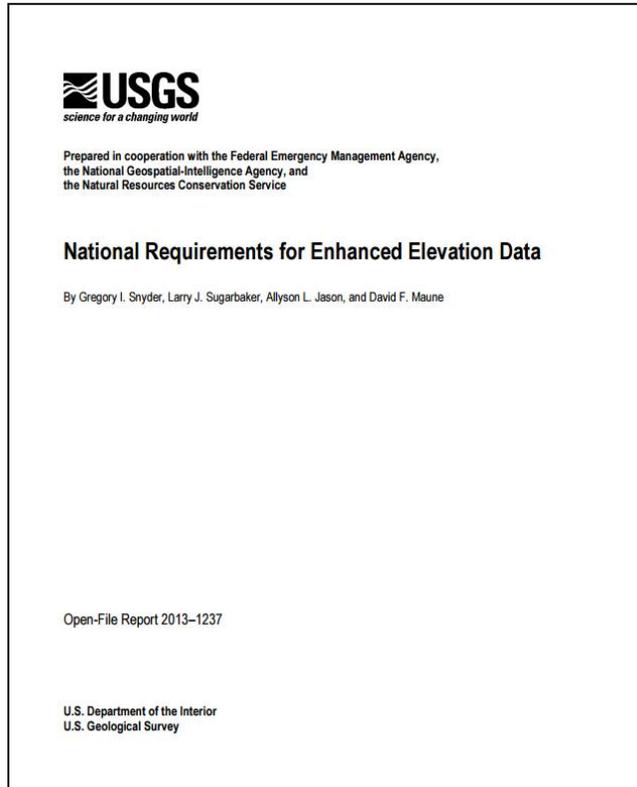
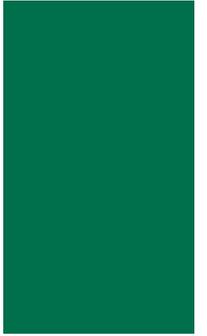
<https://cms.geoplatform.gov/elevation/3DEP/PublicMeetings>

- Notice of Upcoming 3DEP Public Acquisition Opportunity
- **August 10, 2017 at 1pm ET - [Registration](#)**
- **August 17, 2017 at 3pm ET - [Registration](#)**

USGS 3DEP information, <https://nationalmap.gov/3DEP/>



Preparations underway to conduct a second National Enhanced Elevation Assessment or NEEA Survey



Original National Enhanced Elevation Assessment NEEA

The National Enhanced Elevation Assessment (NEEA) was conducted to

- (1) document national level requirements for enhanced elevation data,
- (2) estimate the benefits and costs of meeting those requirements, and
- (3) evaluate multiple national enhanced elevation program scenarios.

◆ <https://nationalmap.gov/3DEP/nea.html>





State Lidar Planning: future work



USGS is contracting with National States Geographic Information Council (NSGIC) to develop a template for State Level Lidar Planning

<https://www.nsgic.org/>

When ready the template will go through NSGIC to State GIOs and GIS Coordinators



Links to submit projects, project collector tool, Seasketch, Geoplatform, TNM, 3DEP...

- **Seasketch:** <http://www.seasketch.org/#projecthomepage/5272840f6ec5f42d210016e4>
- <https://cms.geoplatform.gov/elevation/3DEP/Propose3DEPAOI> **Geoplatform**
- <http://nationalmap.gov/> **The National Map site will also take you to the 3DEP site and more...**

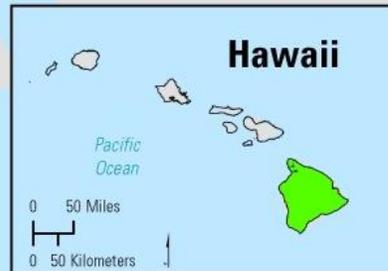
As of 03/13/2017

3D Elevation Program - FY17 Partnerships To Date (March 2017)

For more on the 3D Elevation Program (3DEP) visit:
<http://www.nationalmap.gov/3DEP>

Visit the US Interagency Elevation Inventory (USIEI) at:
<http://coast.noaa.gov/inventory/>

Pacific Ocean



CANADA

Atlantic Ocean

Map shows geographic extent of existing and on-going data acquisition projects that meet current 3DEP Specifications. FY17 Projects are the result of partnership projects awarded through the FY17 3D Elevation Program (3DEP) Broad Agency Announcement (BAA) and through on-going Federal coordination via the 3DEP Working Group.

3DEP Specifications:

- Quality level 2 or better lidar data (ifsar in AK)²
- Publicly available
- 8 years old or newer as of 2016

²as defined in USGS Lidar Base Specification v1.2

Sources:
3DEP FY17 Broad Agency Announcement
USIEI data from March 2017

EXPLANATION

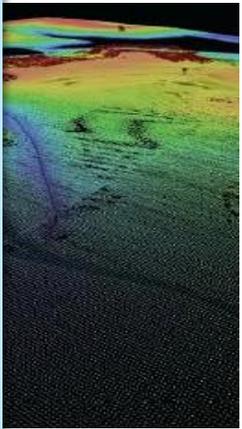
3DEP Partnership Projects

- BAA Opportunities Selected
- Federal Partnerships

In-Progress and Existing Data that Meet 3DEP Specification

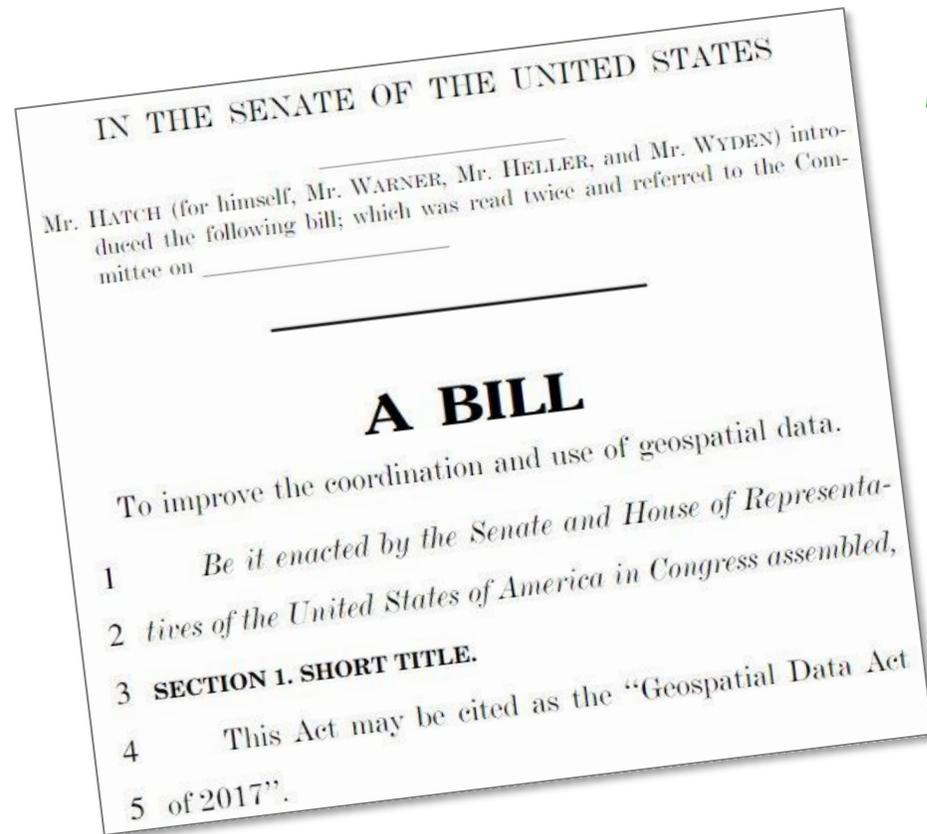
- lidar
- ifsar (Alaska)

Puerto Rico / US Virgin Islands



Geospatial Data Act of 2017

Pam Bond





Cybersecurity RoundTable

Preview: *Bill Farnsworth*

- *Director of Information Security*
- *State Chief Information Security Officer*

TWG Updates

- **Soils TWG**

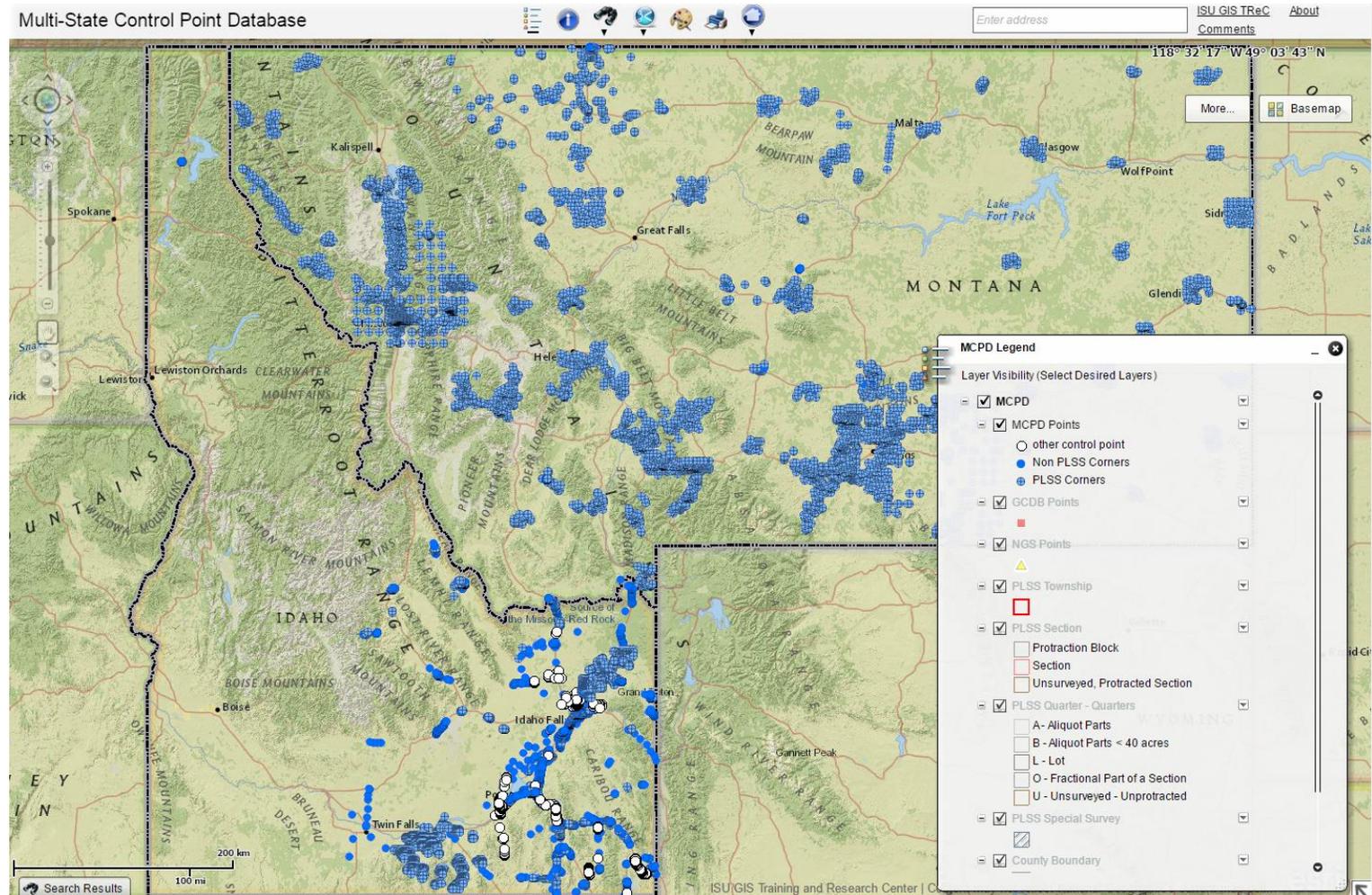
Jerry Korol, NRCS

Geodetic Control Technical Working Group (GC-TWG)

Chair: Keith T Weber, GISP

MCPD

- 13,430 points total
 - Idaho = 8,511 points
 - Montana = 4,919 points



Control Point Life Cycle Study

- Guideline and best practices document to understand a control point's life cycle
 - Are our control points good forever?
 - Do they change?

As you know...

- Projected geospatial data is composed of three elements
 - Datum (e.g., NAD83)
 - Projection (e.g., Transverse Mercator)
 - Units or coordinate system (e.g., meters)
- If we re-project a geographic feature, we can change it's calculated length or area

Similarly...

- If we change the datum, this can affect geometry
- Specifically, we can change a point's representative location

This can happen when a Datum is Updated

- For example: North American Datum of 1983 (NAD 83)
 - Updated/modified (adjusted) a number of times
 - The first version was called NAD 83 (1986)
 - This did NOT include any GNSS data in its calculations
 - Was based solely on the Geodetic Reference System of 1980 reference ellipsoid (GRS 80)

Since NAD83(1986)

- Adjustments
 - 1996 (CORS96)
 - 2007 (NSRS or NRA2007)
 - 2011 (2011) epoch 2010.00

Summary of Results

Table 1. Summary of control point statistical analyses completed in this study

	Mean (m)	Standard Deviation (m)	t-statistic
Differences between horizontal coordinates (2013 vs 2015)			
Easting	0.000	0.023	0.18 ¹
Northing	0.000	0.042	-
Horizontal Difference	0.008	0.039	0.08 ¹
Differences between vertical coordinates (2013 vs 2015)			
Elevation difference using GEOID03	0.072	0.052	-
NAD 83(1986) vs NAD 83(2011)			
Easting Difference	-0.98	0.030	428.65 ¹
Northing Difference	0.680	0.011	551.55 ¹
Horizontal Difference	1.200	0.018	598.26 ¹
NAD 83(1986) vs NAD 83(NRA2007)			
Easting Difference	0.038	0.027	6.43 ²
Northing Difference	-0.037	0.030	5.74 ²
Horizontal Difference	0.062	0.025	10.94 ²
NAD 83(CORS96) vs NAD 83(2011)			
Easting Difference	0.009	0.011	1.90 ³
Northing Difference	0.014	0.021	4.16 ³
Horizontal Difference	0.022	0.017	4.84 ³
Vertical Coordinate using Geoid Models			
GEOID03 vs GEOID12A	0.304	0.237	3.63 ⁴
GEOID99 vs GEOID12A	-0.616	0.029	54.73 ⁵
Difference in coordinates position due to velocity			
NAD 83(2011) 2010.00 > NAD 83(CORS96) 2002.00	0.600	0.671	5.49 ⁶

1- t-critical (0.05) value = 1.99

2- t-critical (0.05) value = 2.09

3- t-critical (0.05) value = 2.13

4- t-critical (0.05) value = 2.37

5- t-critical (0.05) value = 2.20

6- t-critical (0.05) value = 2.02

Take Home Message

- The earth's plates are moving
- Accuracy is dependent on *age of observation*
- This is important today because our instruments can measure location within the error tolerance of datum shifts

Questions?



Acknowledgements: Dr. Kazi Arifuzzaman (Geodetic Coordinator) provided many of the calculations shown in these slides

Idaho Statewide Lidar Plan

Jessie Sherburne, Idaho Lidar Consortium Coordinator
JessicaSherburne@boisestate.edu

Idaholidar.org
Summer 2017



Working together to collect lidar across Idaho

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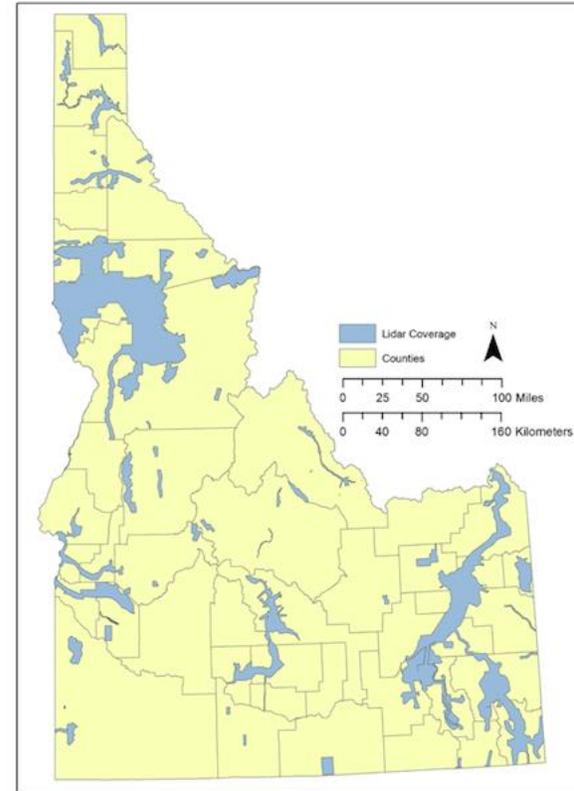
Importance of Lidar in Idaho

- Flood and other risk hazard assessments
- Transportation infrastructure planning and modeling – roads, bridges, dams, etc.
- Fuels assessments
- Natural resource mapping (soils)
- Forestry
- Education, training, and research



Current State of Lidar in Idaho

- Currently: 11.7% statewide coverage (2016)
- Past acquisitions have been facilitated by:
 - Federal programs (USGS 3DEP, FEMA, BLM, USFS, BoR, DOE, etc)
 - State agencies
 - County, city municipalities
 - Utilities
 - Universities
 - Many more



National Business Use Cost Benefits

Maune (2017) Cost Benefit Analysis Nationwide

Table 1. Estimated Annual Dollar Benefits, by Business Use, from Enhanced Elevation Data

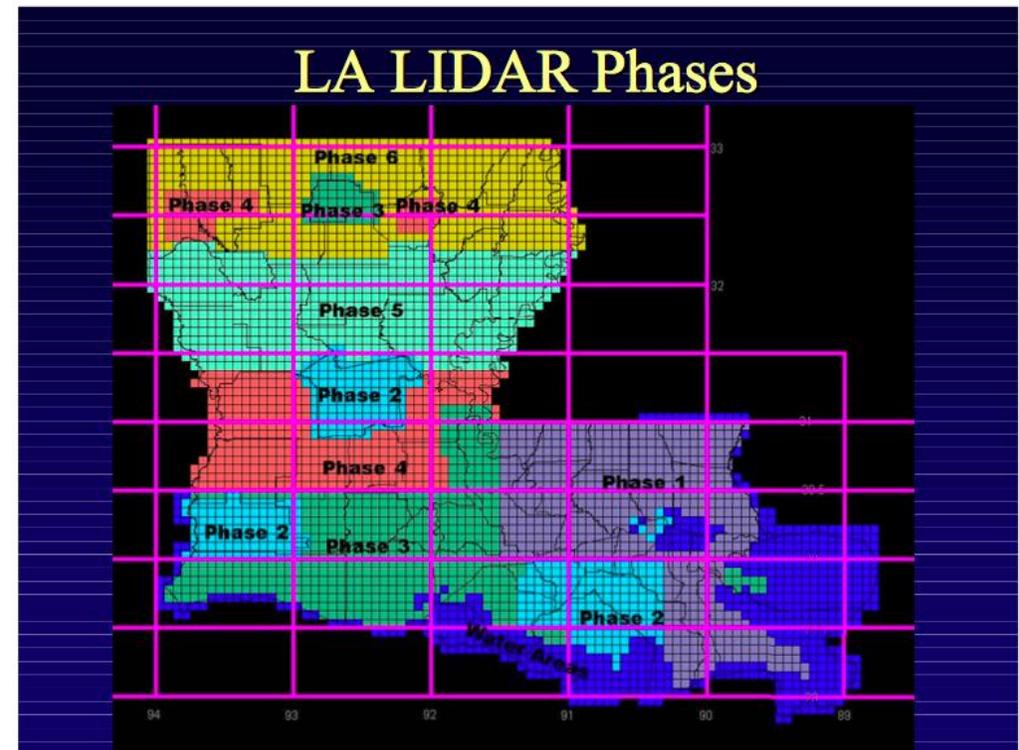
BU#	Business Use (BU) Name	Enhanced Elevation Data Annual Benefits	
		Conservative Benefits	Potential Benefits
14	Flood Risk Management	\$440.853M	\$787.886M
21	Infrastructure and Construction Management	\$246.311M	\$974.643M
1	Natural Resources Conservation	\$169.037M	\$337.164M
8	Agriculture and Precision Farming	\$122.330M	\$2,011.330M
2	Water Supply and Quality	\$85.659M	\$156.583M
16	Wildfire Management, Planning and Response	\$84.250M	\$166.950M
9	Geologic Resource Assessment and Hazard Mitigation	\$54.235M	\$1,069.235M
5	Forest Resources Management	\$43.949M	\$61.655M
3	River and Stream Resource Management	\$39.564M	\$86.632M
20	Aviation Navigation and Safety	\$35.000M	\$56.000M
4	Coastal Zone Management	\$23.785M	\$41.740M
17	Homeland Security, Law Enforcement, Disaster Response	\$10.444M	\$126.544M
11	Renewable Energy Resources	\$10.050M	\$100.050M
12	Oil and Gas Resources	\$10.000M	\$100.000M
22	Urban and Regional Planning	\$7.415M	\$68.744M
15	Sea Level Rise and Subsidence	\$5.800M	\$21.660M
10	Resource Mining	\$1.686M	\$4.864M
7	Wildlife and Habitat Management	\$1.510M	\$4.020M
13	Cultural Resources Preservation and Management	\$0.800M	\$7.000M
25	Education K-12 and Beyond	\$0.514M	\$2.514M
18	Land Navigation and Safety	\$0.316M	\$7,125,000M ¹
27	Telecommunications	\$0.185M	\$1.850M
26	Recreation	\$0.100M	\$0.100M
23	Health and Human Services	\$0.000M	\$1.000M
19	Marine Navigation and Safety	\$0.000M	\$0.000M
24	Real Estate, Banking, Mortgage, Insurance	\$0.000M	\$0.000M
6	Rangeland Management	\$0.000M	\$0.000M
Total Estimated Annual Dollar Benefits		\$1,393.793M	\$13,313.164M

Using Dewberry (2011) business uses and ranking based on State of Idaho businesses.

Rank	Business use	Annual benefits (millions)
1	Agriculture and precision farming	\$1.71
2	Natural resources conservation	\$1.63
3	Infrastructure and construction management	\$1.03
4	Geologic resource assessment and hazard mitigation	\$0.62
5	Flood risk management	\$0.46
6	Forest resources management	\$0.41
7	Aviation navigation and safety	\$0.08
8	Renewable energy resources	\$0.06
9	River and stream resource management	\$0.05
10	Water supply and quality	\$0.04
Other		\$0.03
Total		\$6.12

Many States Have Created Statewide Plans

- North Carolina
- Virginia
- Pennsylvania
- Maryland
- Iowa
- Louisiana
- Minnesota
- Massachusetts
- Indiana
- Delaware
- Connecticut
- Ohio



Why Does Idaho Need a Statewide Plan?

- Increase coordination efforts / create more partnerships
- Cost effective – more partners, overall cost decreases
- If funds are available from federal programs that give preference to states with demonstrated statewide coordination, we will be ready
- Set lidar standards for the state in the statewide plan
 - provide the maximum benefit for all users

Elements of Statewide Plans

- Projected cost analysis
- Collaboration with many state and federal agencies
- Prioritization based on risk/resources
- Identify uses for lidar in the state
- Identify standards for the state
- Statewide prioritization survey
- Approval of plan by GIS community, federal agencies, governor, etc.

Timeline & Cost for Statewide Acquisition

Description	Area (km ²)	Cost (km ²)*	Percent Total (of 216,630 km ²)
Current lidar coverage	25,129 (1,176 km ² collected in 2016)	-----	11.6%
Proposed coverage 2017	4,000	\$ 450,000*	13.4%
Suggested coverage 2018-2020	75,600	\$ 9,000,000*	53%
Suggested coverage 2021-2024	111,901	\$ 12, 000,000*	100%
Data and management cost (2017 projected cost)	-----	Approximately 5%	-----
Total	216, 630	\$22,522,500	-----

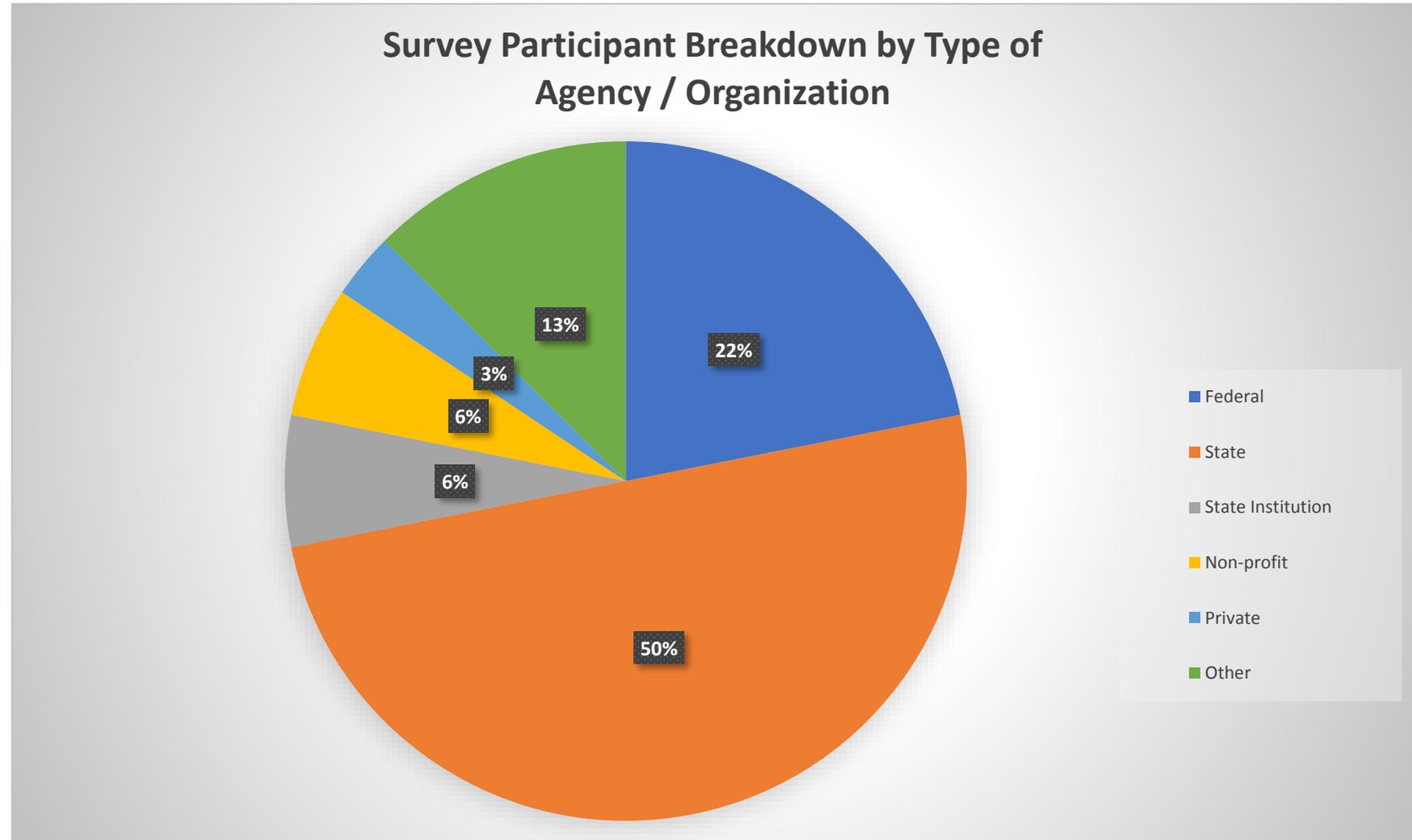
*Cost is a rough estimate based on \$0.50/acre.

Prioritizing Regions

- Agency/Organization Input
 - Priority Watershed Survey
- Risk/Resources
 - Risk Map
 - Urban Theme
 - Water
 - Forest
 - Agriculture
- Other?

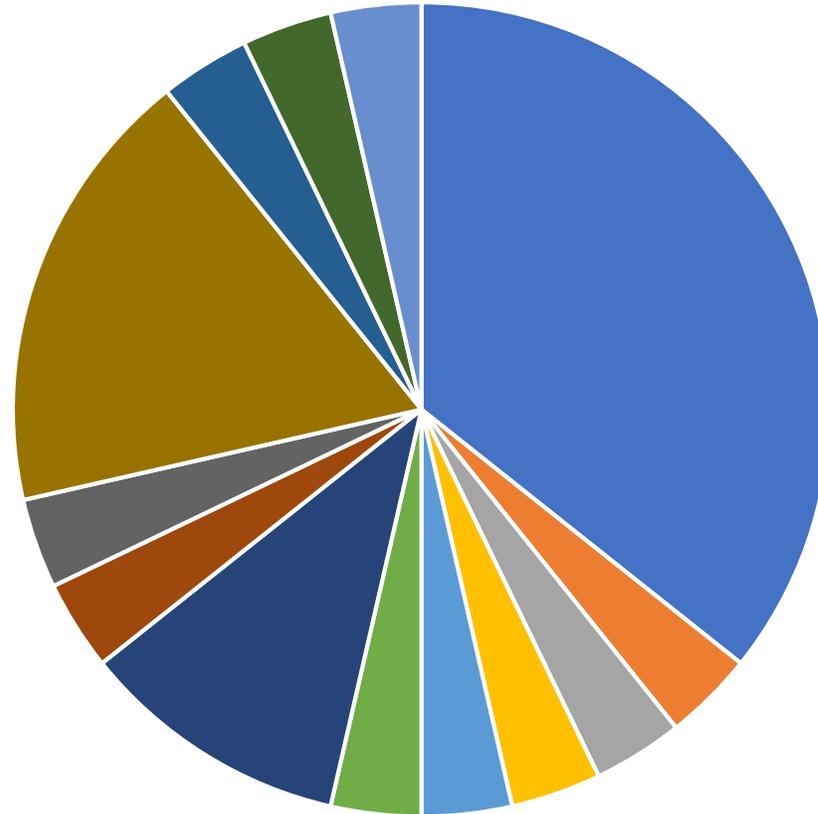
Priority Watershed Survey Summary

- 34 participants



Priority Watershed Survey Summary

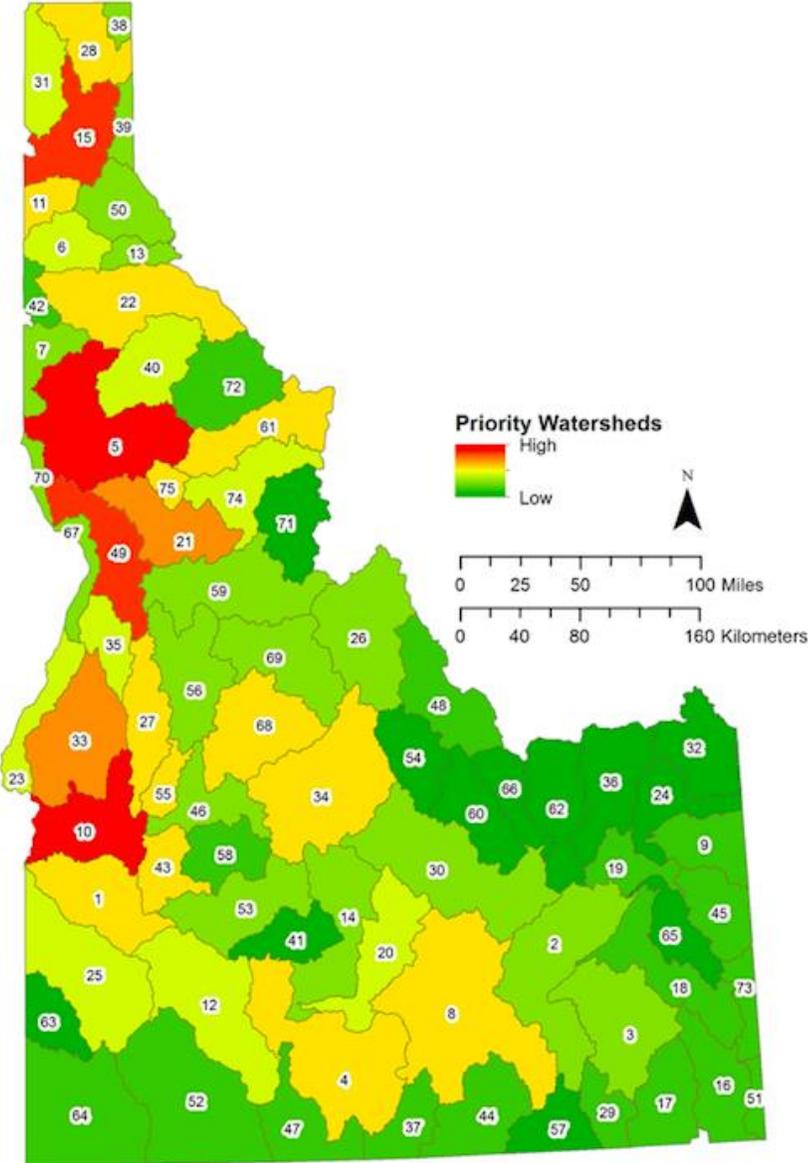
- Survey breakdown by location



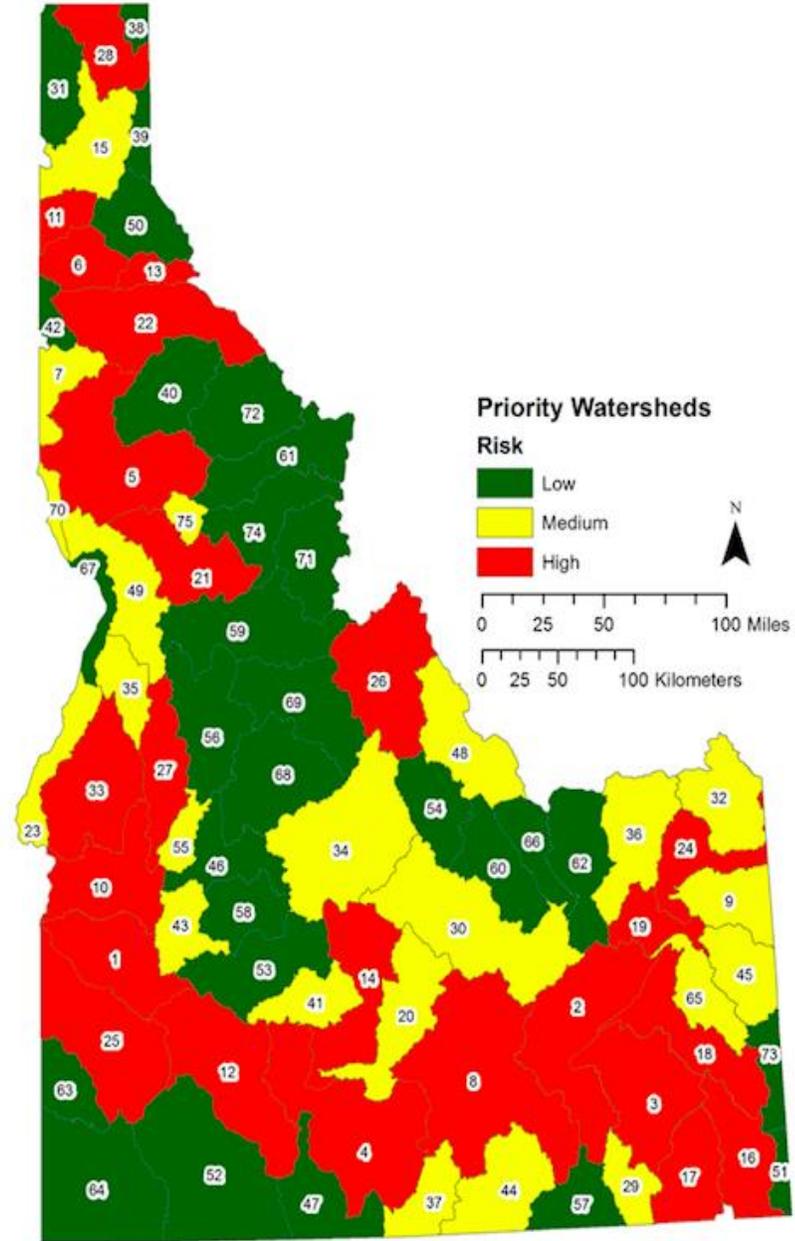
Boise Bonner's Ferry Coeur d'Alene Grangeville Idaho City
Ketchum Lapwai McCall Meridian Moscow
Pocatello Priest River Walla Walla

Priority Map Based on Participant Response

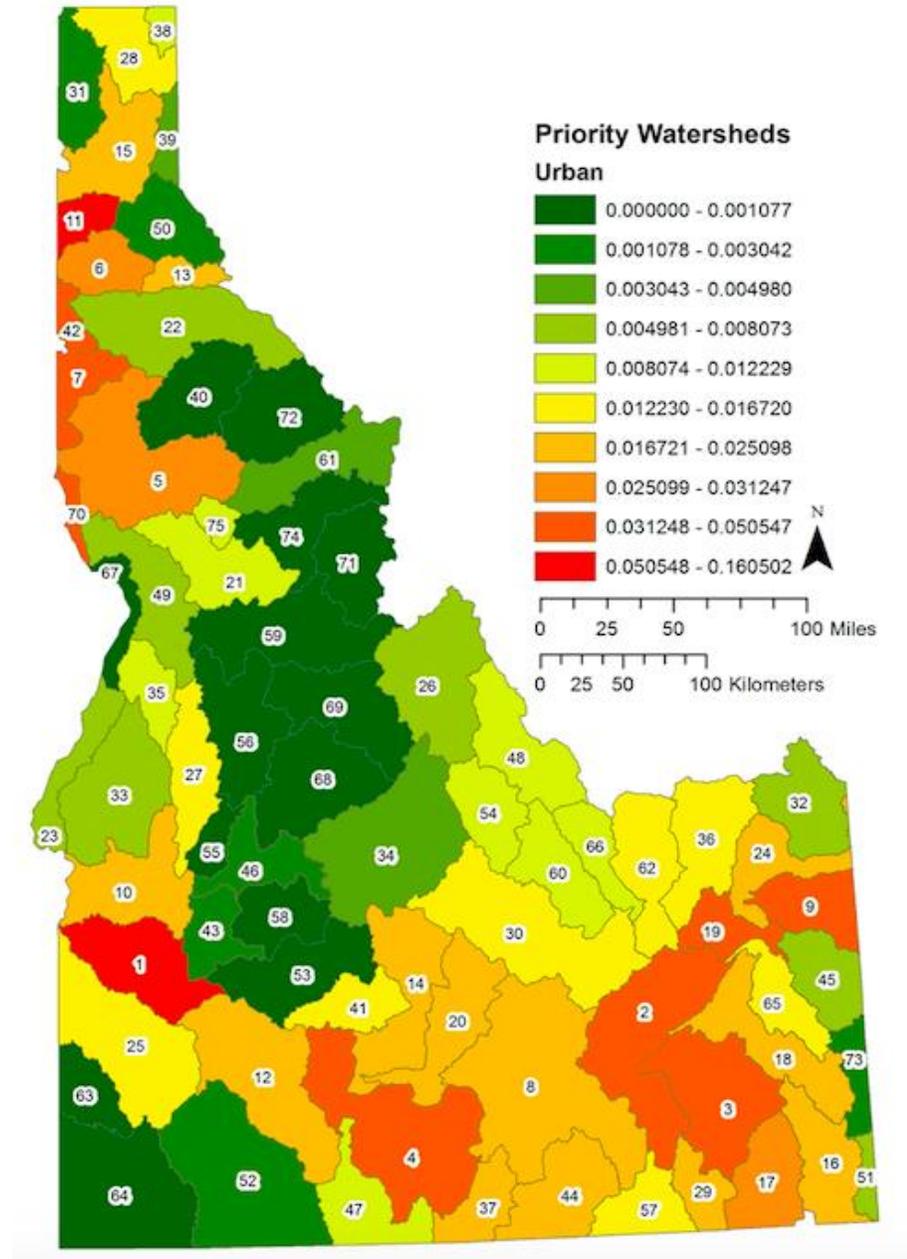
We need more input from around the state.



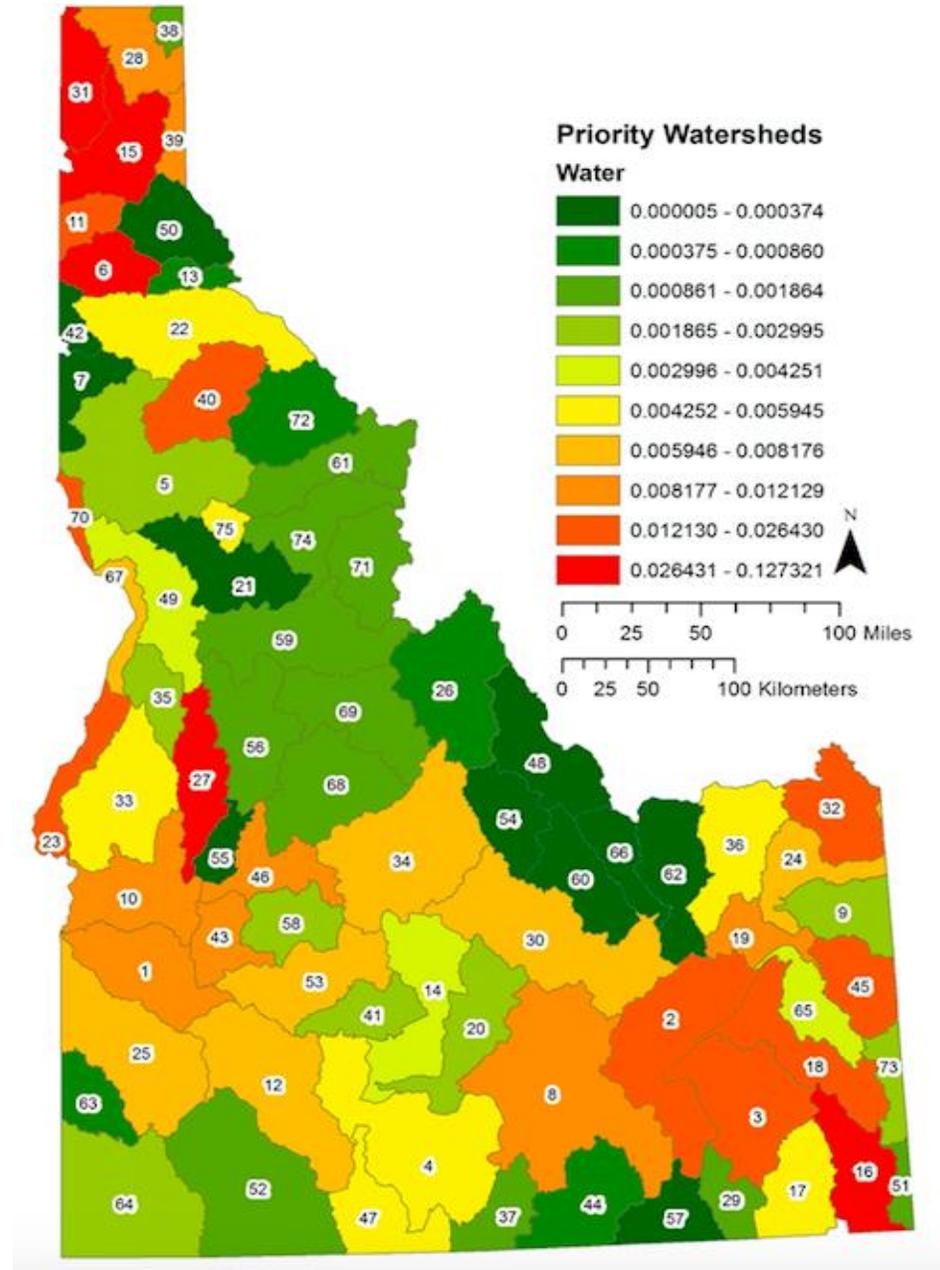
Risk theme



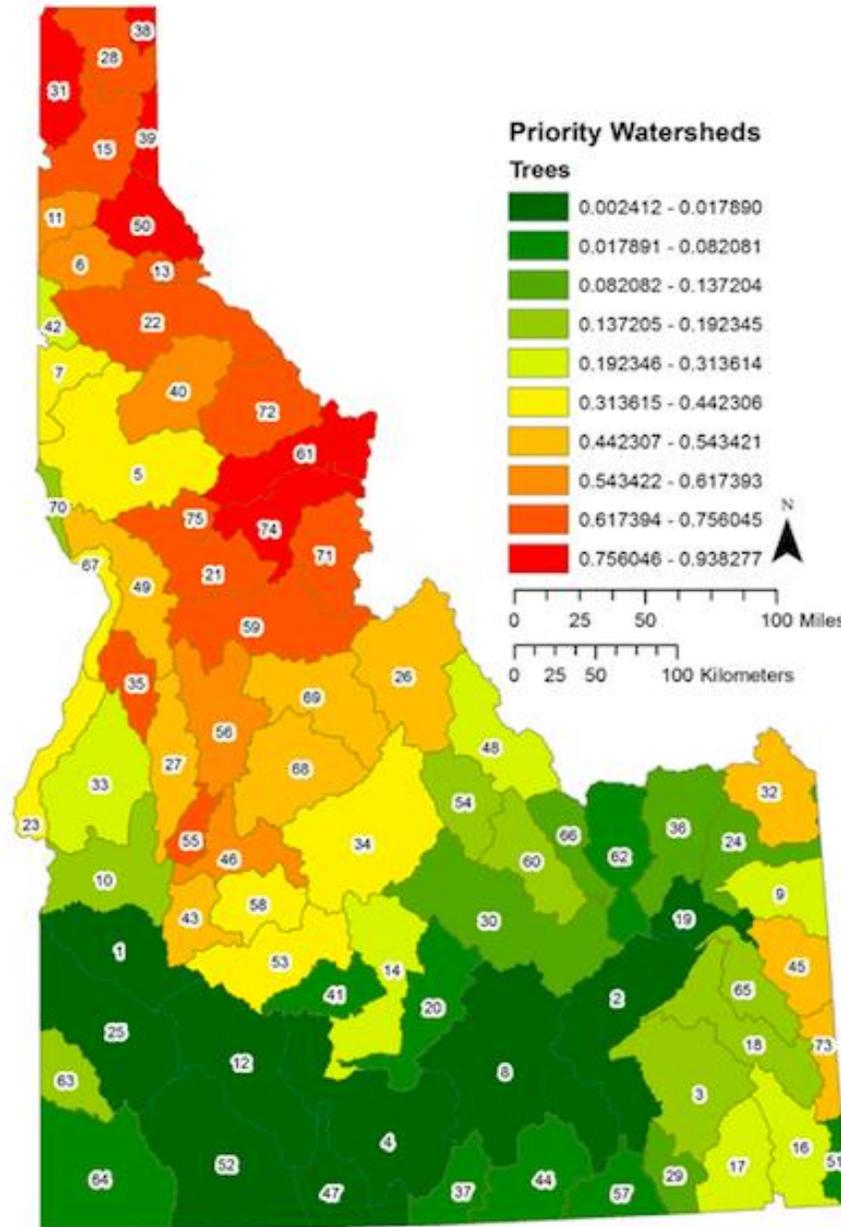
Urban theme



Water theme

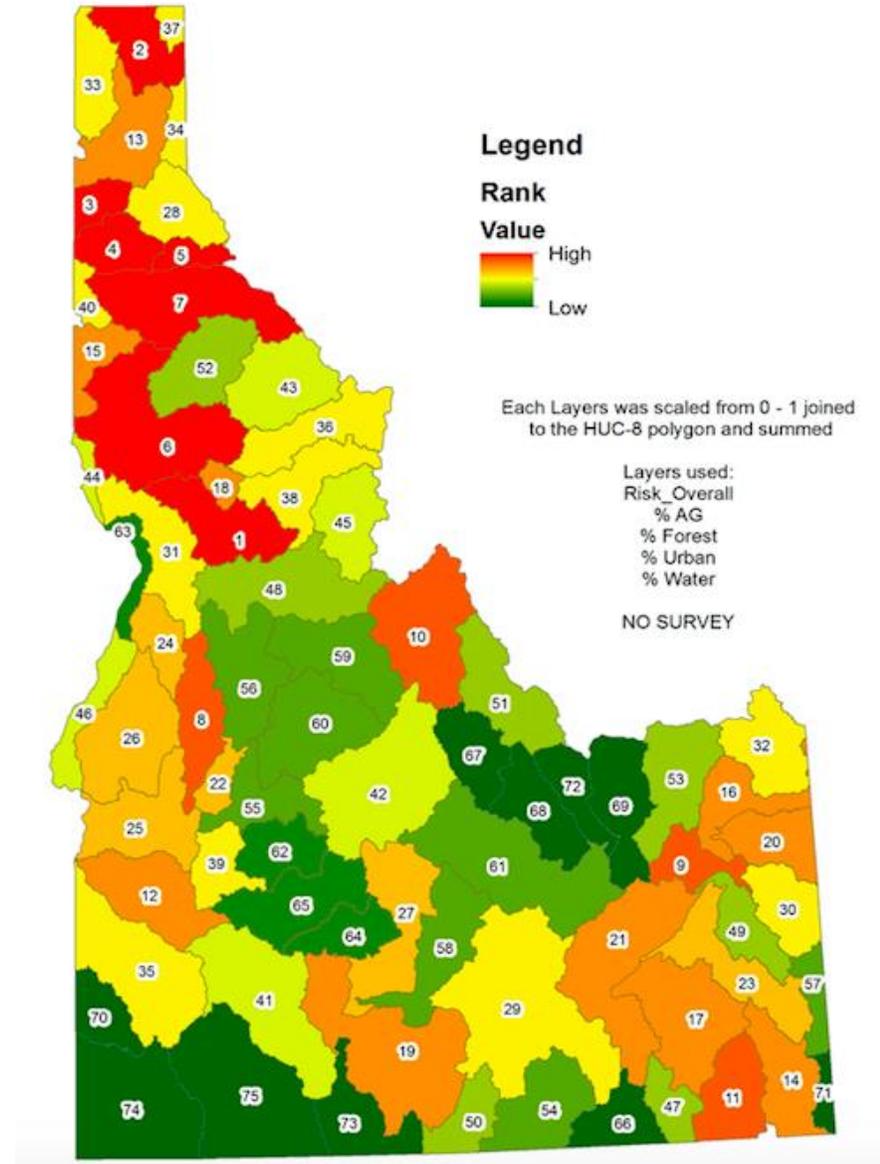


Forest theme



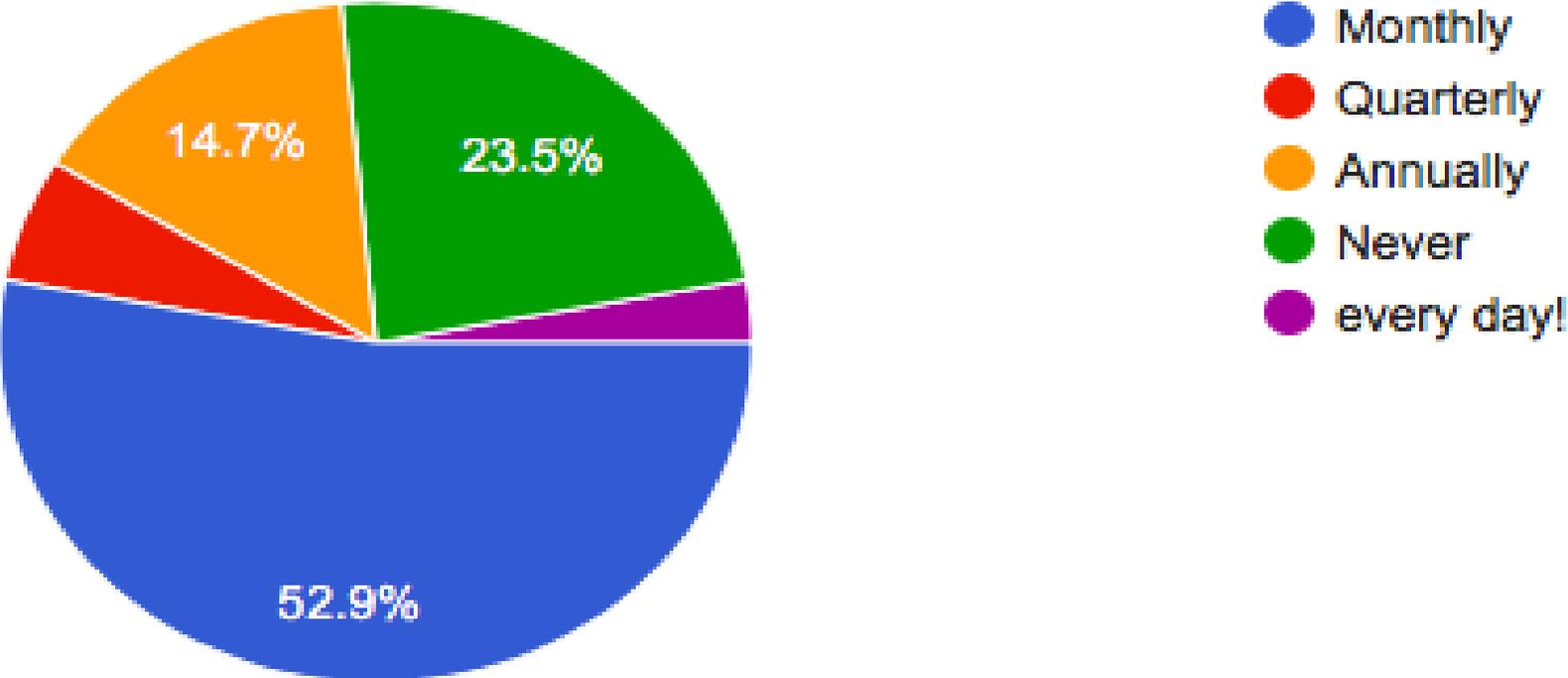
Priority Regions Map

- Combines Risk/Resources Maps

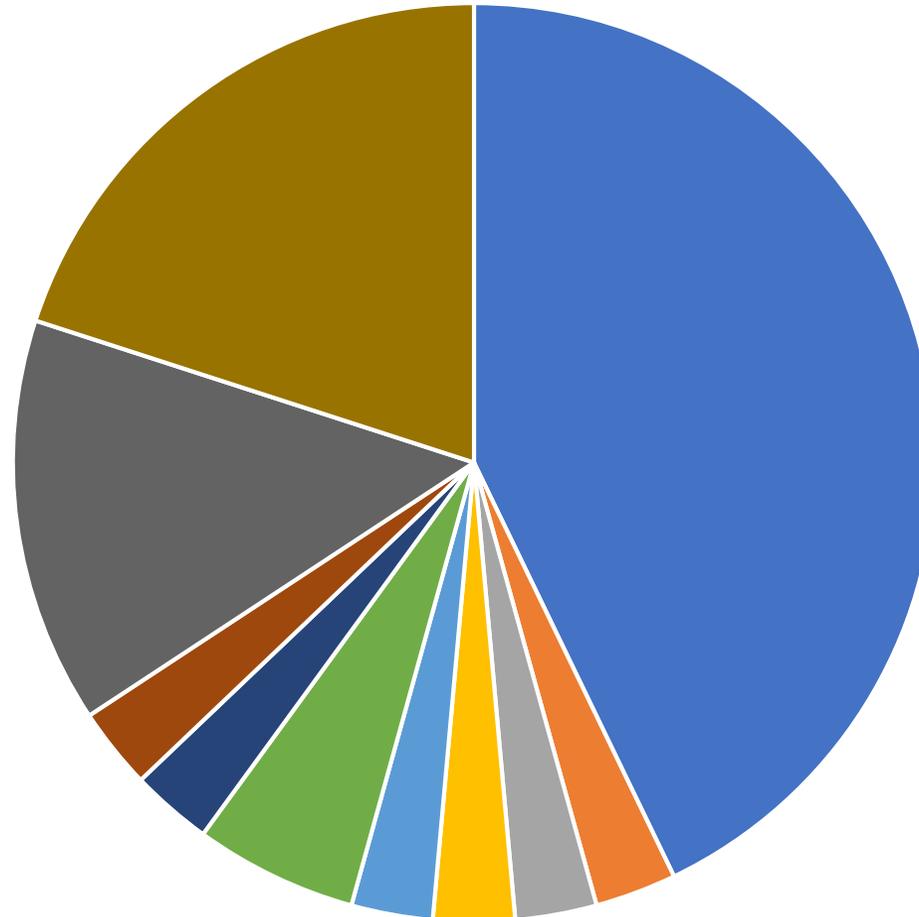


How often do you or your agency / organization use lidar?

34 responses



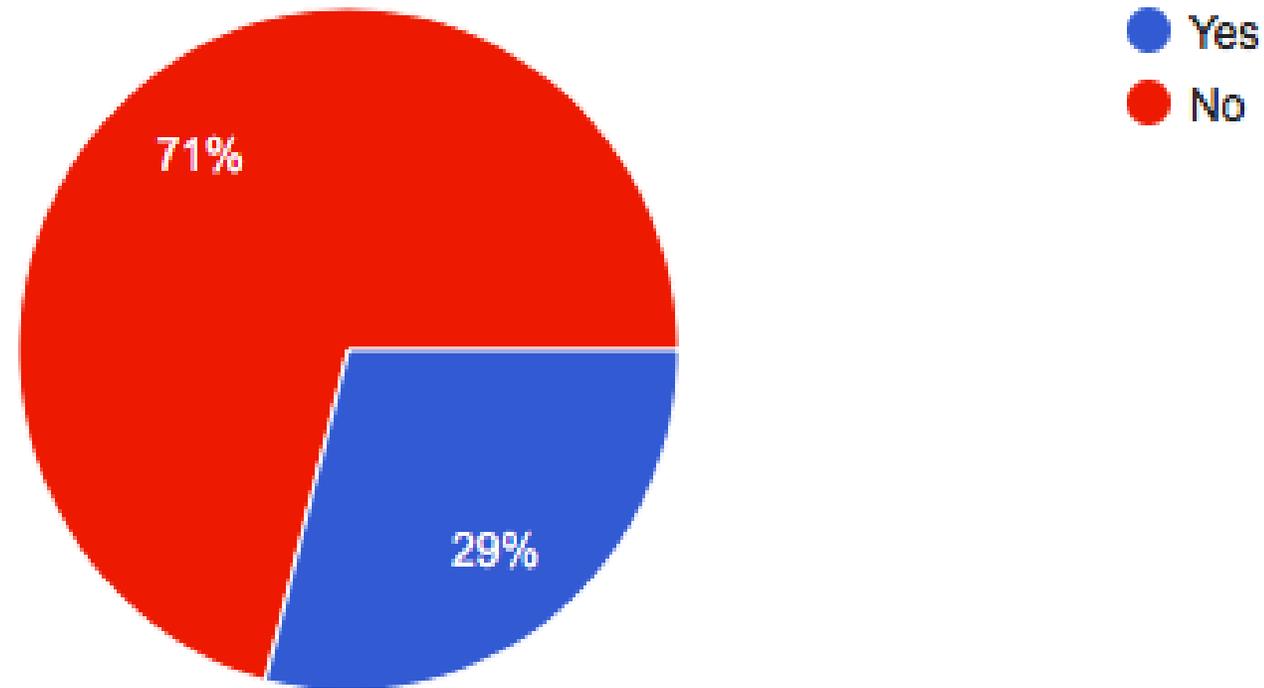
Money Spent on Lidar Annually



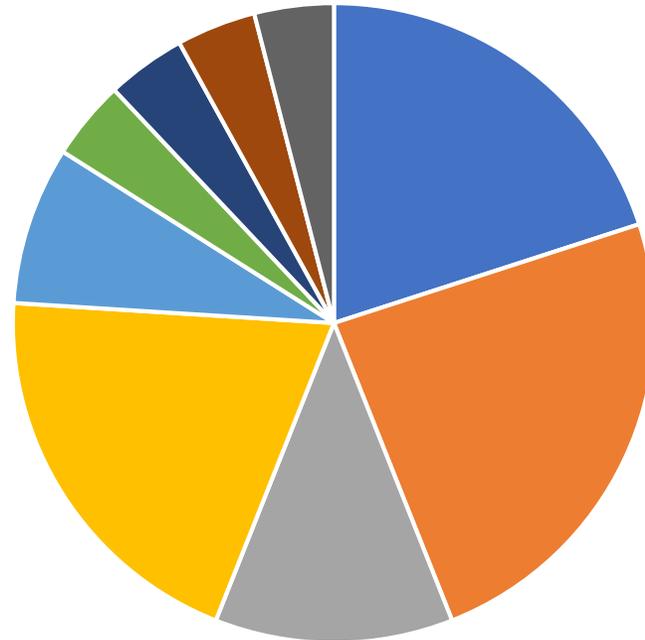
- \$0
- 2,000
- 10,000
- 25,000
- 60,000
- 100,000
- 400,000
- \$2,000,000
- Don't know
- No answer

Does your agency / organization have funding to collect lidar currently?
Answering this question does not obligate you to contribute funds.

31 responses

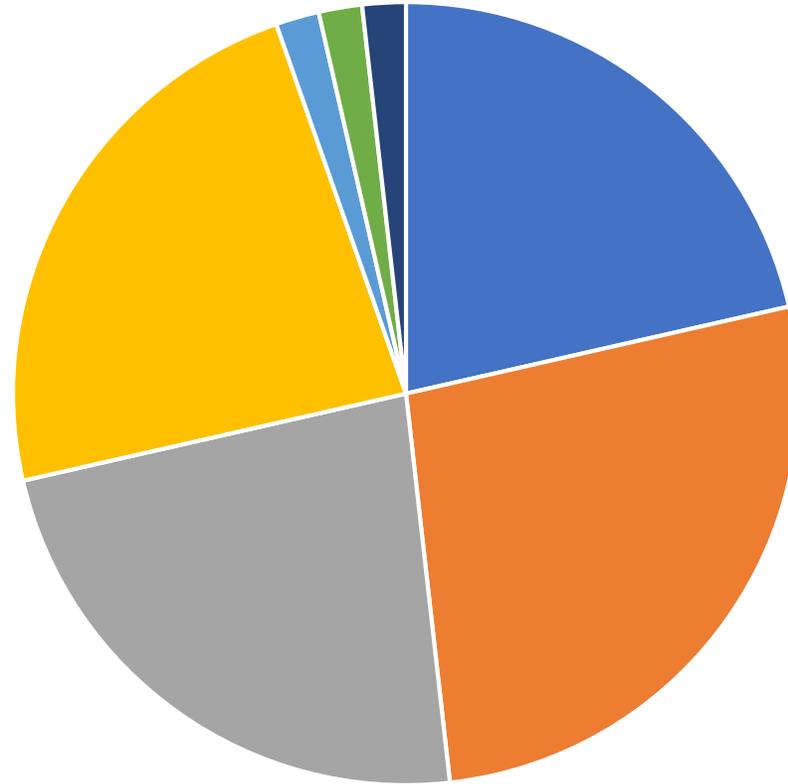


What is Limiting Participant Use of Lidar



- Complete coverage over large areas
- Availability
- Technical capabilities
- Money
- Time
- Need
- Understanding lidar data sets exist
- Distributing large files online
- End user visualization

Participant Interest in Learning More about Lidar



■ How to use GLOBUS

■ How to process vegetation and topo lidar data

■ Using CAVE

■ Updating National Hydrography Dataset using lidar

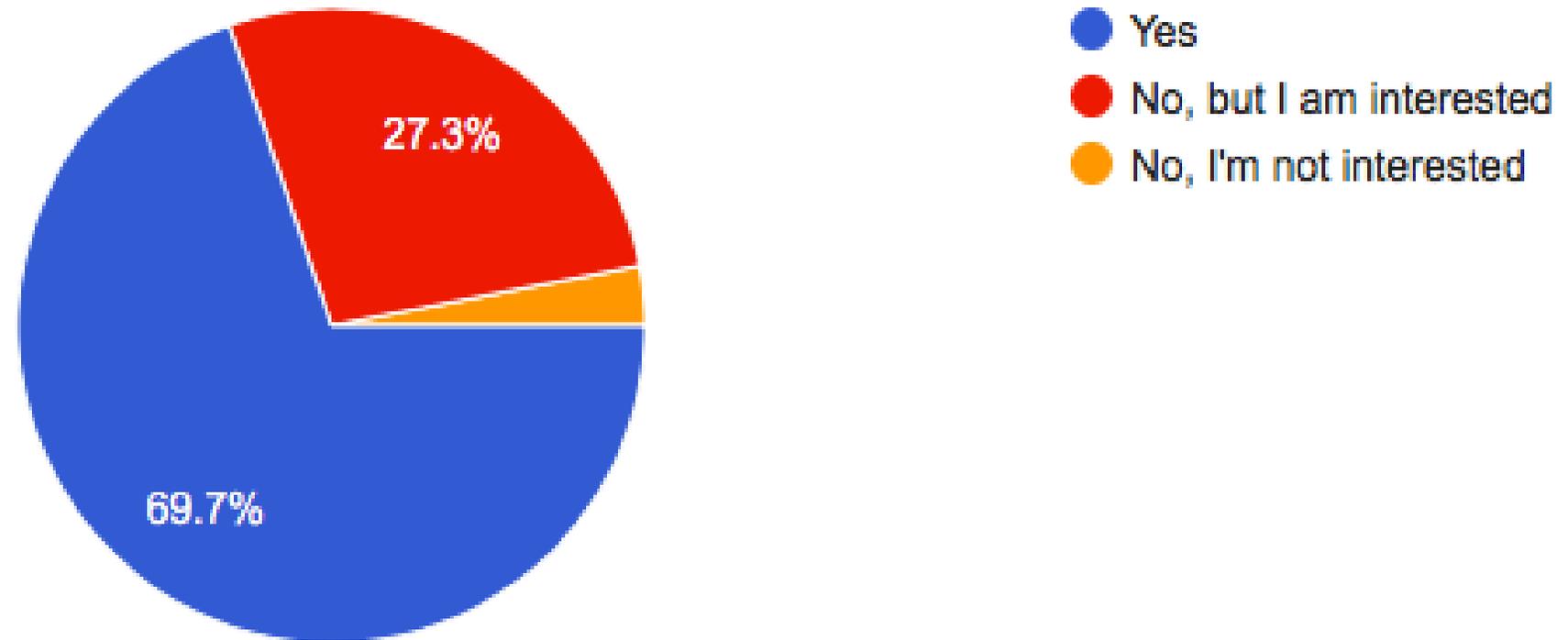
■ How to use lidar to map vegetation and topography

■ Case study using lidar

■ Geo and hazard mapping

Are you subscribed on the Geotech Listserv (<http://admws.idaho.gov/mailman/listinfo/geotech>)?

33 responses



Timeline

- We are collecting comments from individuals who helped create Statewide Lidar Plan until July 31st
- Send to IGC-EC after we incorporate above comments ~ Aug 7
- Send to Geotech listserv after we incorporate IGC-EC comments ~ September 1

OTHER BUSINESS

- **IGC-EC Vacancy (Seat 10: Private Sector)**

The Science of Where

OTHER BUSINESS

Esri User Conference 2017 ✨

..... Big Ideas



<http://p.ctx.ly/r/50oy>

Adjourn

NEXT MEETING:

Thursday, September 21, 2017