

The LiDAR Program in Missouri

Branson LiDAR Workshop

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Chair, MGISAC Data Development

Outline

- Data Development Committee
- Lidar Stakeholders Group
- National Elevation Enhancement Assessment
- National Strategy for complete coverage
- Current Lidar status

Data Development Committee

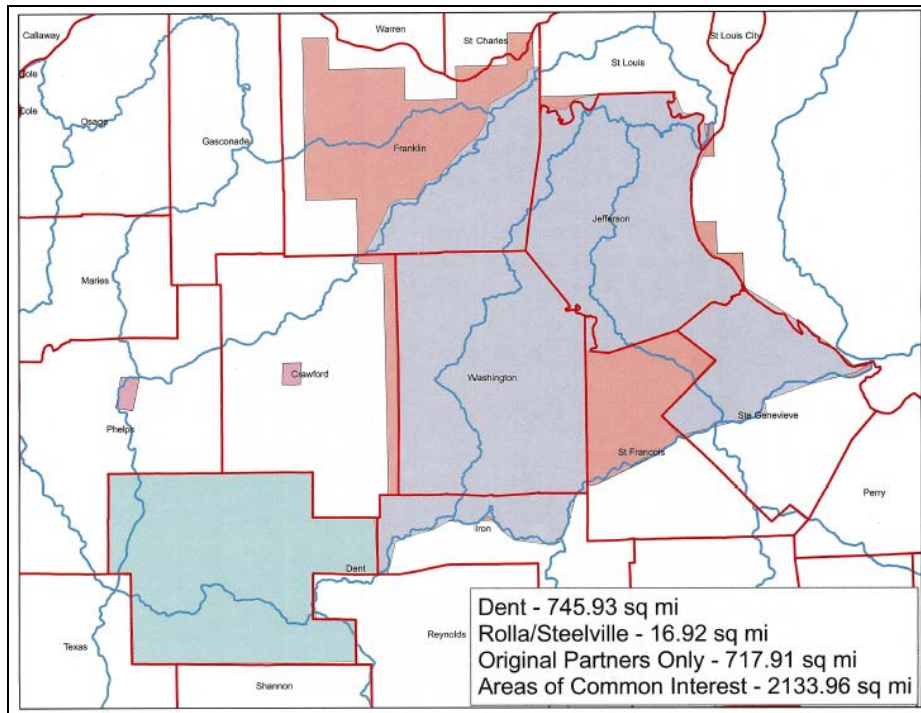
- Committee consists of Federal, State, Regional, Local, and Private Industry
- Started in 2004, initial purpose was to acquire state wide imagery
- We meet quarterly either in person or by phone bridge. Next meeting is March 27 in Columbia

Lidar Stakeholders Group 2009

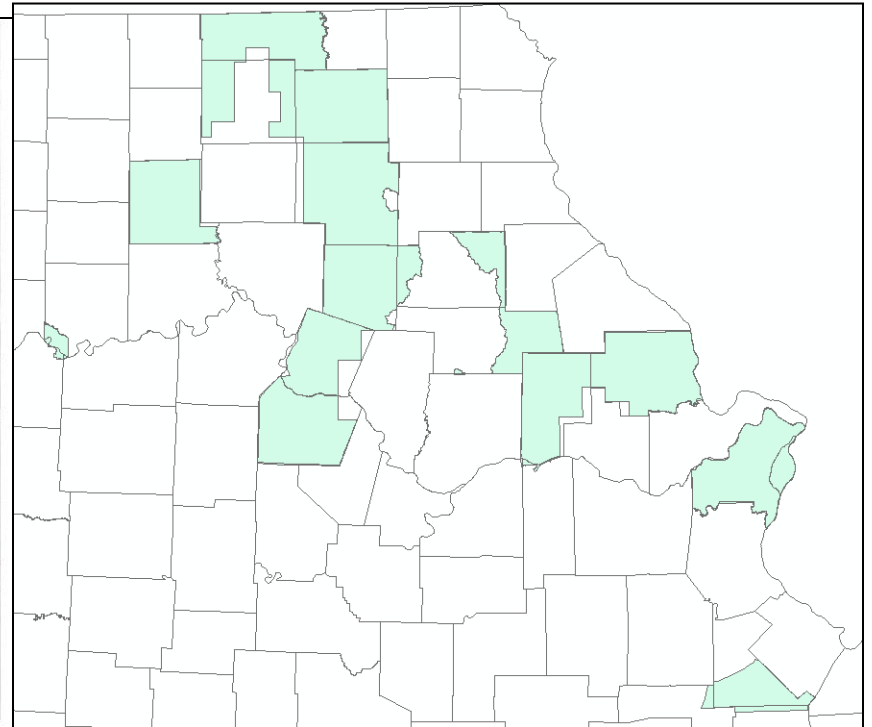
- Came about to pool resources for LiDAR collection, economy of scale
- Those agencies that have actively acquired Lidar asked to participate
- Includes SEMA, DNR, MDC, NRCS, USACE-KC, StL and RI, USGS, FEMA
- Has been very successful

Stakeholder Projects

2011 Meramec



2012 Mo Grand



2012

- We will meet in late May to determine where partners need Lidar, who has funding and best way to contract (have used USACE-St Louis)

How do I get my City, County, region collected?

- Let a Stakeholders know (St Francois County added this year due to local need)
- If you have funding it makes your area much easier for partnerships, otherwise it depends on our (stakeholders) having the need.
- There is an economy of scale

+ National Enhanced Elevation Assessment

Completed in December 2012

Sponsor:

- National Digital Elevation Program (NDEP) – Twelve-member agencies, NSGIC

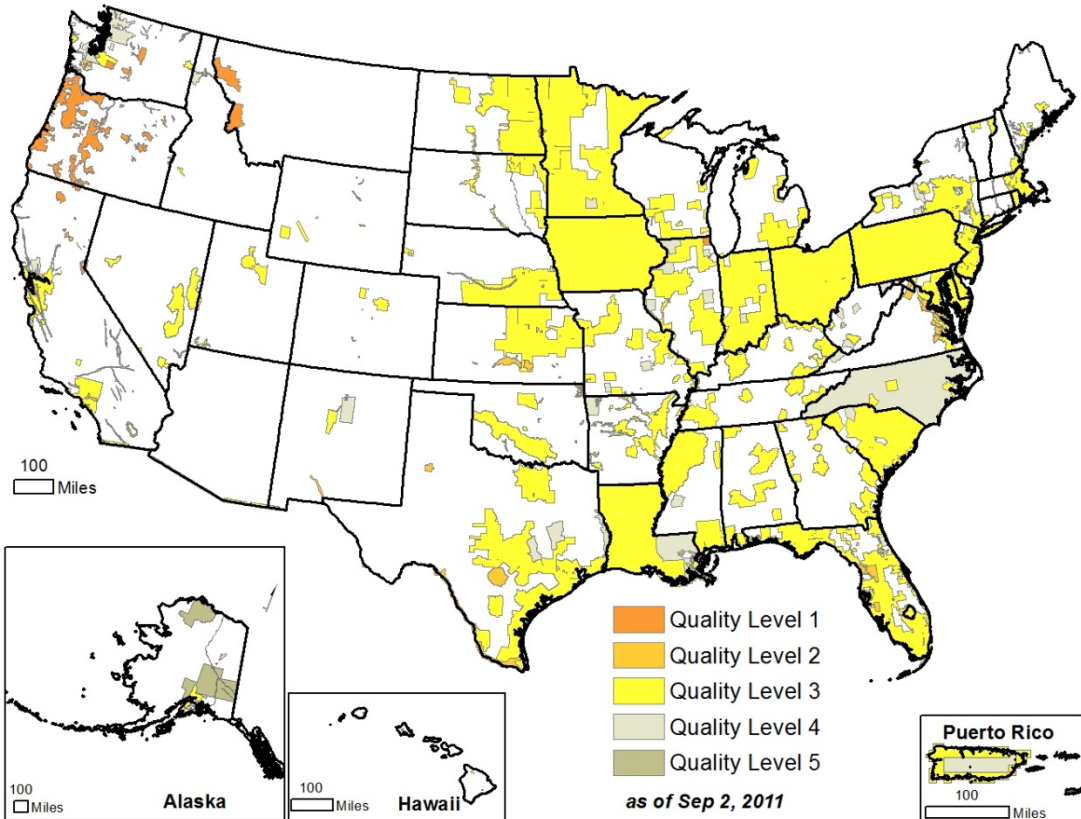
Partners:

- U.S. Geological Survey (Managing Partner)
- National Geospatial-Intelligence Agency
- Federal Emergency Management Agency
- Natural Resources Conservation Service
- National Oceanic and Atmospheric Administration
- Study participants - 34 Federal agencies, 50 states and others



National Digital Elevation Program (NDEP)

Status of Elevation Data



Map depicts public sources of LiDAR in all states plus IfSAR data in Alaska

1996 - 2011

- 28% coverage - 49 states
- 15% coverage – Alaska
- 30+ year replacement cycle
- Program is efficient – less than 10% overlap of coverage
- Cooperative data projects work
- Data quality variable

Why is this a problem?

- Remaining 72% coverage is 30 or more years old.
- Alaska – very poor quality
- Meets 10% of need. Current and emerging needs require much higher quality data.

NEEA Quality Levels

Quality Levels	Elevation Source	Horizontal Resolution Terms			Vertical Accuracy Terms	
		Point Density	Nominal Pulse Spacing	NED Post Spacing	RMSEz in Open Terrain *	Equivalent Contour Accuracy
QL 1	LIDAR	8 pts/m ²	0.35 m	1/27 arc-sec (~1 m)	9.25 cm	1-ft
QL 2	LIDAR	2 pts/m ²	0.7 m	1/27 arc-sec (~1 m)	9.25 cm	1-ft
QL 3	LIDAR	1 – 0.25 pts/m ²	1 – 2 m	1/9 arc-sec (~3 m)	≤18.5 cm	2-ft
QL 4	Imagery	1 – 0.04 pts/m ²	1 – 5 m	1/3 arc-sec (~10 m)	46.3 cm – 139 cm	5 – 15 ft
QL 5	IFSAR	0.04 pts/m ²	5 m	1/3 arc-sec (~10 m)	92.7 cm – 185 cm	10 – 20 ft



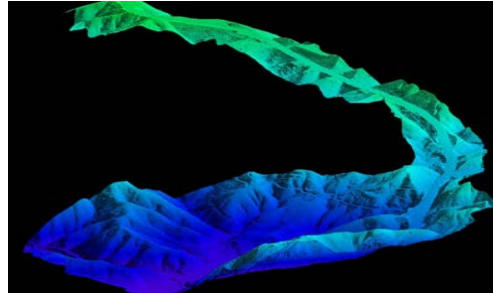
Example Functional Activities (Needs)

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602 Functional Activities documented from 34 Federal agencies, 50 States and Territories and from sampled non-profit, industry, local governments and tribes



Precision Farming



Land Navigation and Safety



Geologic Resources and
Hazards Mitigation



Natural Resource
Conservation



Infrastructure Management



Flood Risk Mitigation



Benefits for Top Business Uses

		Annual Benefits	
Rank		Conservative	Potential
1	Flood Risk Management	\$295M	\$502M
2	Infrastructure and Construction Management	\$206M	\$942M
3	Natural Resources Conservation	\$159M	\$335M
4	Agriculture and Precision Farming	\$122M	\$2,011M
5	Water Supply and Quality	\$85M	\$156M
6	Wildfire Management, Planning and Response	\$76M	\$159M
7	Geologic Resource Assessment and Hazard Mitigation	\$52M	\$1,067M
8	Forest Resources Management	\$44M	\$62M
9	River and Stream Resource Management	\$38M	\$87M
10	Aviation Navigation and Safety	\$35M	\$56M
:			
20	Land Navigation and Safety	\$0.2M	\$7,125M
Total for all Business Uses (1 – 27)		\$1.2B	\$13B



Potential Elevation Data Program Options

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Option 1: Quality Level 2 (QL2) LiDAR* - 8 year acquisition (3)

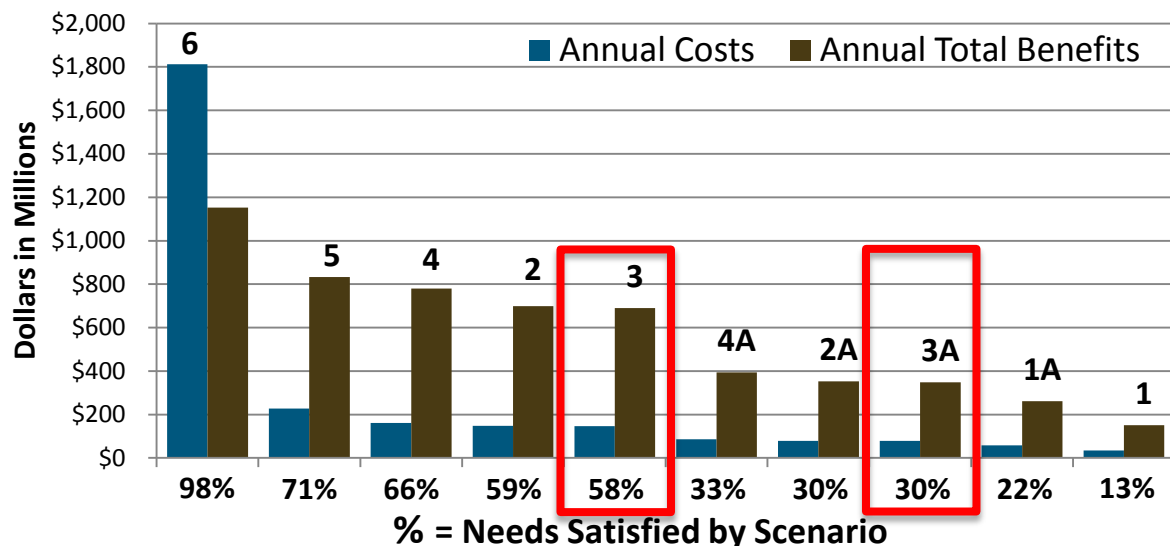
- Average Annual Costs: \$146M
- Average Annual Benefits: \$690M (B/C Ratio - 4.7:1)
- Total Possible Benefits Satisfied: 58%

Option 2: Uniform QL2 LiDAR - 15 year acquisition (3A)

- Average Annual Costs: \$78M
- Average Annual Benefits: \$349M (B/C Ratio - 4.5:1)
- Total Possible Benefits Satisfied: 30%

Option 3: Uniform QL2 LiDAR - 15 year acquisition (3A plus cost share)

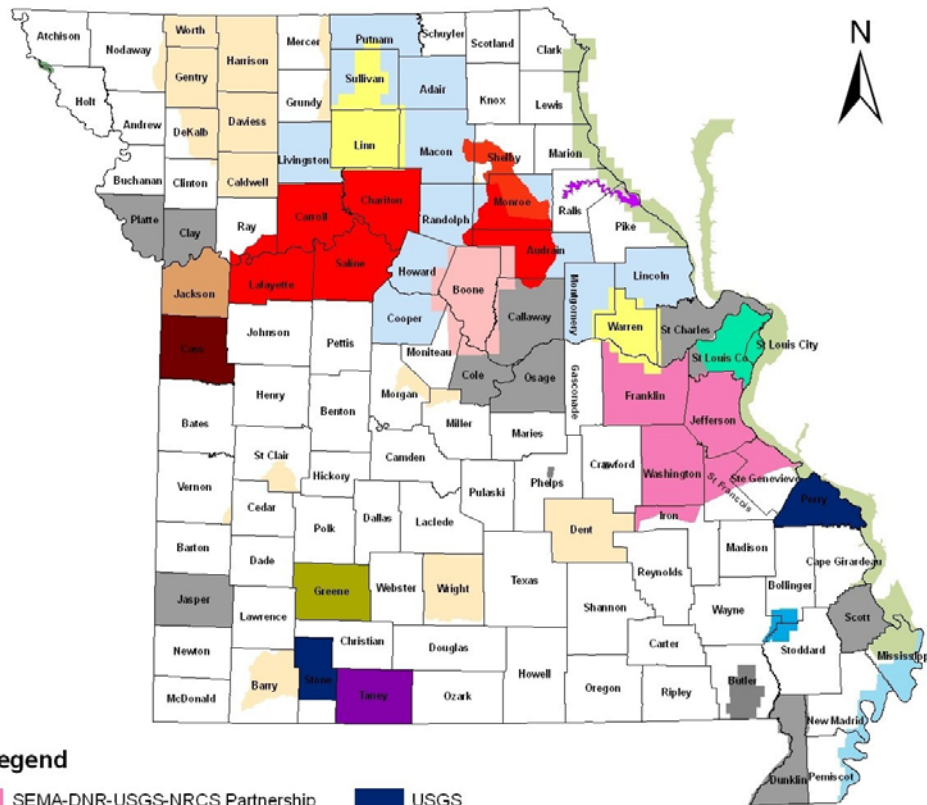
- Average Annual Costs: \$39M plus 50% cost share (partner contribution)
- Average Annual Benefits: \$349M (B/C Ratio - 4.5:1)
- Total Possible Benefits Satisfied: 30%





















Results

- Best return with QL 2 on an 8 year cycle.
- Most of LiDAR in Missouri is QL 3
- Moving forward with a funding strategy to go before Congress.
- Multi agencies sharing the cost

Elevation Mapping from Airborne LiDAR Completed or Contracted



Legend

- | | | | |
|---|---------------------------------------|---|---------------------------------|
|  | SEMA-DNR-USGS-NRCS Partnership |  | USGS |
|  | DNR-NRCS Partnership |  | NRCS-KC COE Partnership |
|  | Boone County |  | KC COE |
|  | St. Louis COE |  | Rock Island COE |
|  | Greene County |  | Memphis COE |
|  | Cass County |  | SEMA (RISKMap 4ft Contour Spec) |
|  | NRCS-SEMA-USGS-KC COE Partnership | | |
|  | Jackson County | | |
|  | Taney County | | |
|  | Metropolitan St. Louis Sewer District | | |
|  | SEMA | | |
|  | MDC | | |
- Note: Collection specifications vary by agency. However, all data except those noted were collected to support at least a 2ft resolution.

Note: Collection specifications vary some among projects. However, all data except those noted as RiskMap 4ft spec were collected to support at least a 2ft contour mapping standard.

Updated 11/2011

Contact Information

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