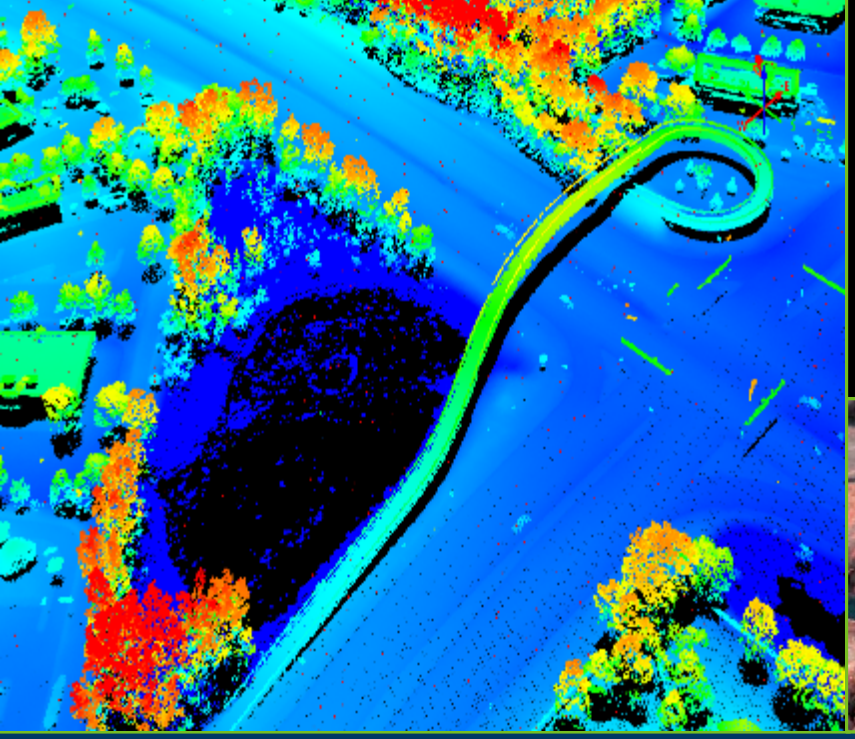
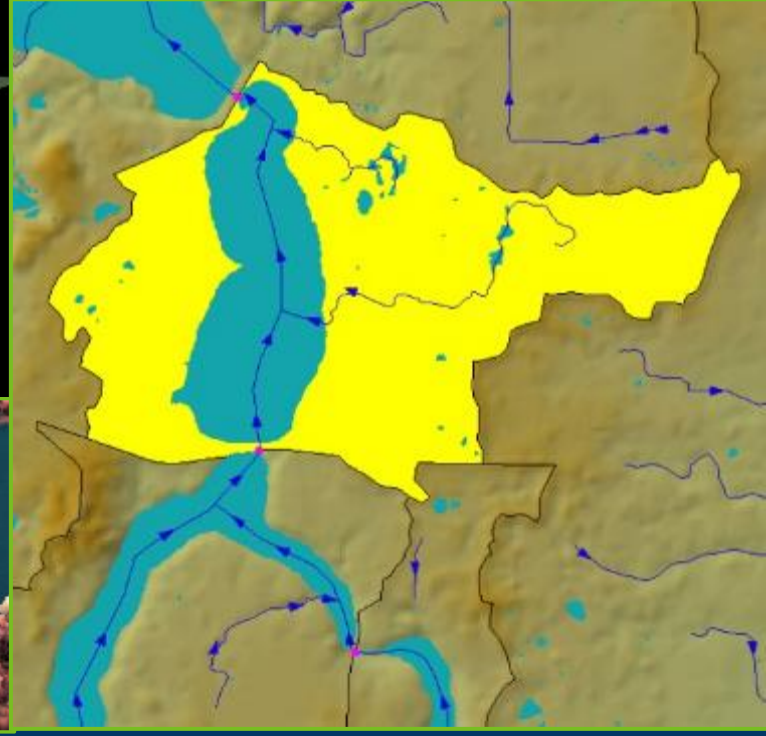


3DGeo Stakeholder Coordination: MN Lidar Plan

Central and Upper Mississippi River LABs - USGS 3DEP Grant Application Discussion

Monday August 23, 2021 - 1:00 – 3:00

Presented by the Geospatial Advisory Council (GAC) - 3D Geomatics Committee's Data Acquisition Workgroup

MINNESOTA GEOSPATIAL ADVISORY COUNCIL

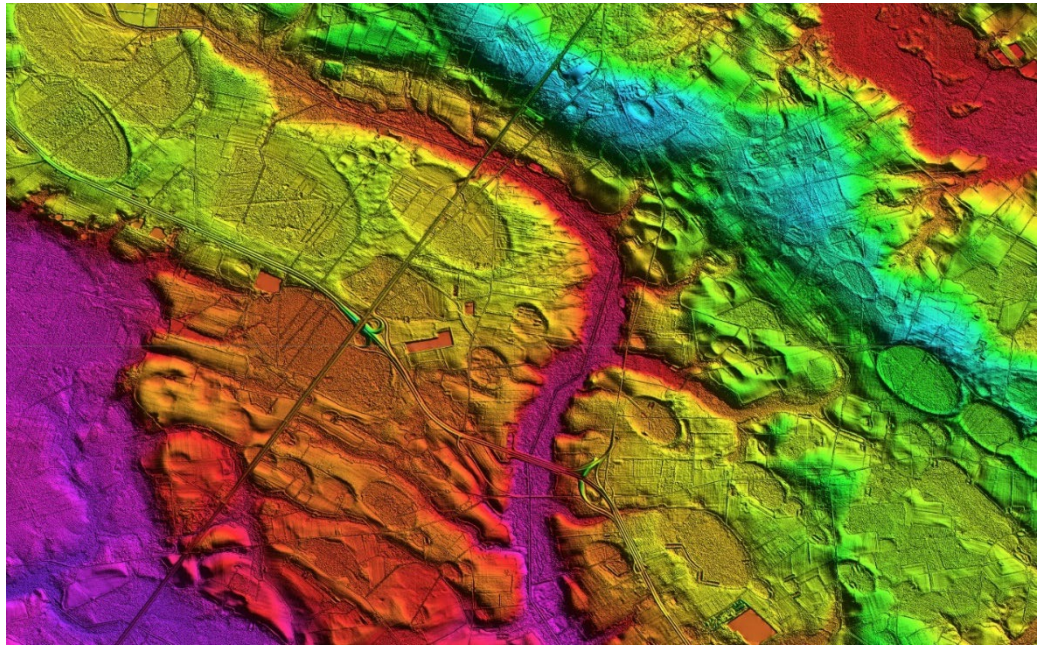
Jesse Reinhardt
Gerry Sjerven
Sean Vaughn
Jennifer Corcoran
Alison Slaats

Please stand by as other participants join, we will get started soon. Thank you

Welcome!

Thank you for joining us today

- We are excited to meet with you today to discuss lidar acquisition planning efforts in Minnesota.
- Members of the 3D Geomatics Committee Lidar Acquisition Workgroup will be introducing 3DGeo, sharing updates, and information about next steps for lidar collection for Minnesota.
- We welcome your input today and going forward.

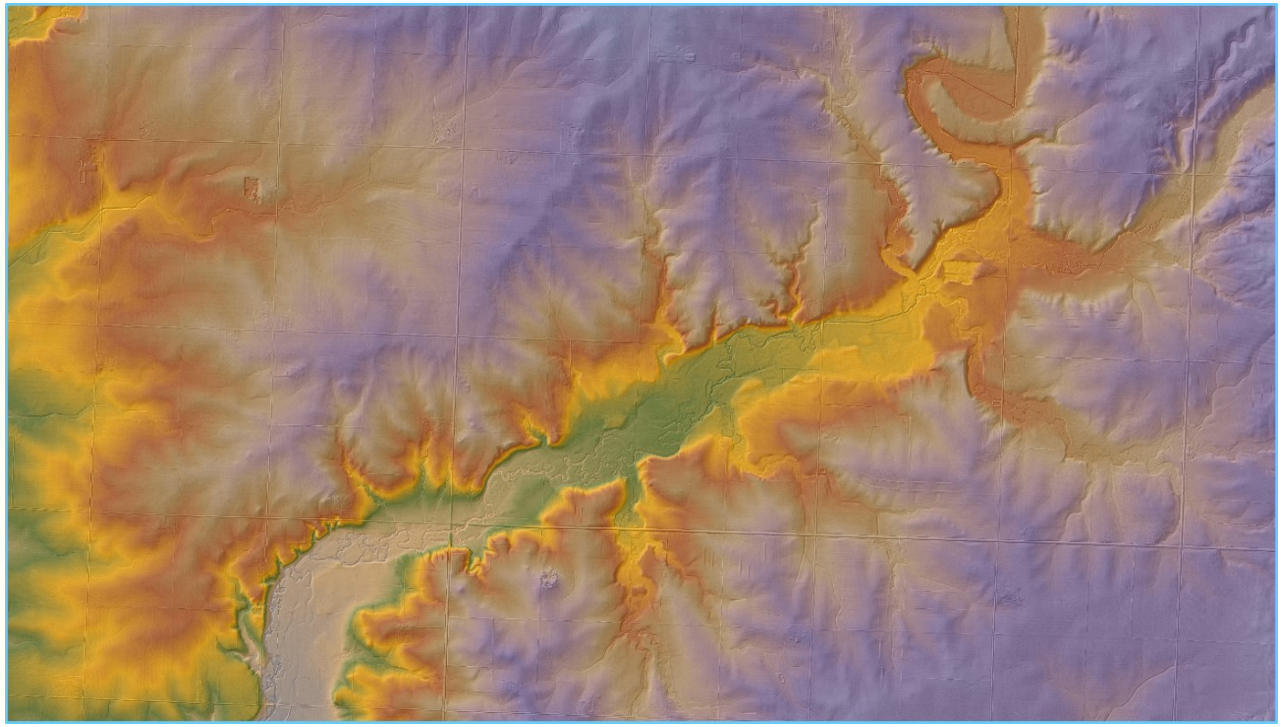


Meeting Housekeeping

- Please **mute** your microphone if you're not speaking
- A meeting recording and presentation slides will be shared after the meeting
- Type in questions into the **chat window**, and we'll address them during the Q&A section (not recorded)

Goals for today

- Who is 3D Geomatics (**3DGeo**)?
- USGS 3D Elevation Program (**3DEP**) and Broad Agency Announcement (BAA) submission process
- Lidar **Quality Levels**
- **Roles** of USGS, state, county and local partners
- **Contract** administration and fund match structure
- **Cost estimates** and partner participation specific to each region
- Communication and **next steps**
- Question and answer

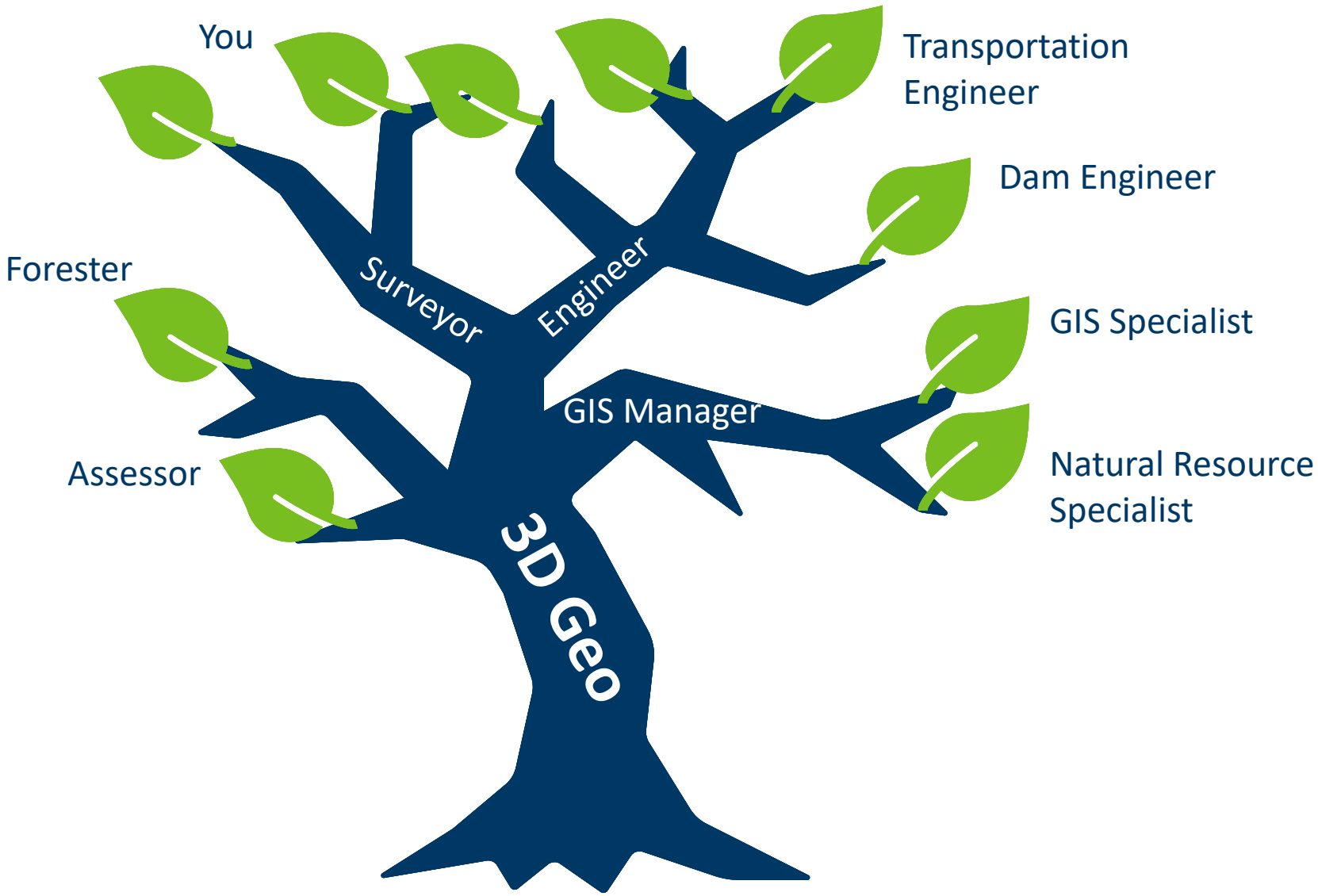


Collaboration – Individual Stakeholder

You don't have to have money or be a decision maker to be a stakeholder . . .

You can be a voice of support . . .

A collaborator



Coordinating Minnesota's Lidar Acquisition

Geospatial Advisory Council (GAC) - 3D Geomatics Committee

Geospatial Advisory Council

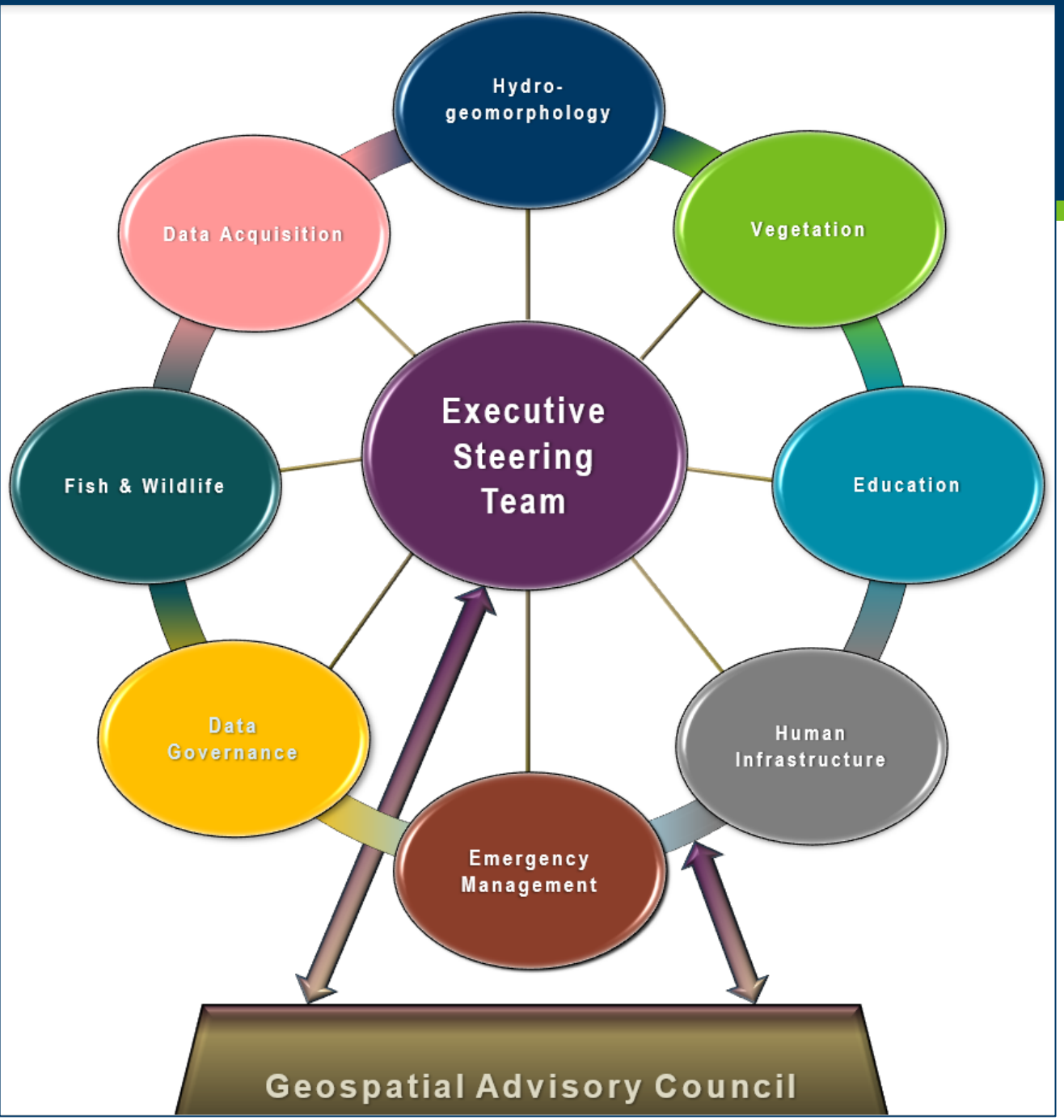
- The Minnesota ***Geospatial Advisory Council*** *(GAC)* is the coordinating body for the Minnesota geospatial community.
- **Cross-section of organizations** that include counties, cities, universities, business, nonprofit organizations, federal and state agencies, tribal government, and other stakeholder groups.

3D Geomatics Committee?

- The ***3D Geomatics Committee*** (3DGeo) is a committee under GAC that works to identify and promote the need for planning, funding, acquisition, and management of three-dimensional geomatic data and derived products.

MINNESOTA
GEOSPATIAL ADVISORY COUNCIL

GAC Rank	Project or Initiative Name
1	All public geospatial data in MN to be free and open to everyone
2	Updated and aligned boundary data from authoritative sources
3	The implementation of an archive for Minnesota geospatial data
4	Statewide publicly available parcel data
5	Improvements to the MnGeo Imagery Service, such as Web Mercator support, tiling, and complementary options such as "composite of latest leaf off imagery", and downloading options
6	Accurate hydro-DEMs (hDEM) that serve modern flood modeling and hydro-terrain analysis tools, and the development of more accurate watercourses and watersheds
7	Statewide publicly available road centerline data
8	New LiDAR data acquisition across Minnesota for use in developing new derived products guided by committee developed standards
9	An emergency management damage assessment data standard to provide an accepted specification to support a request for State or Federal assistance after a disaster
10	Statewide publicly available address points data
11	Maps, procedures, templates and other materials to help all levels of government implement the U.S. National Grid
12	A parks and trails data standard
13	A forum (committee, workgroup, etc.) for MN geospatial professionals to discuss and share best practices, standards, lessons learned, etc. for implementing and supporting the geospatial components of NG9-1-1



3DGeo Workgroups

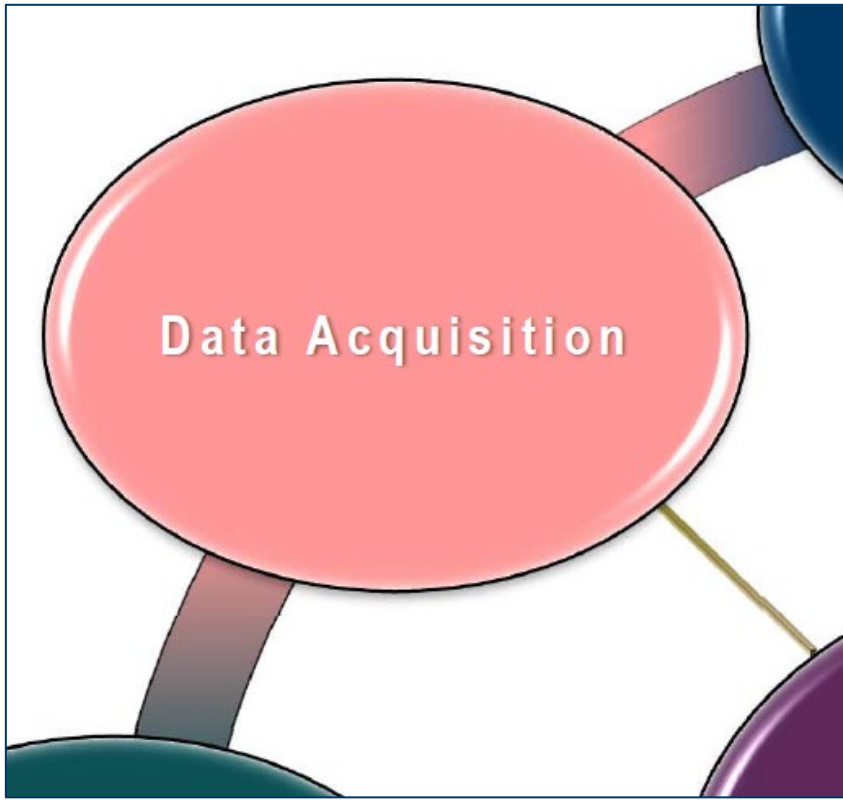
3DGeo Executive Steering Team

- Workgroups/Subgroups
  - Hydrogeomorphology
    1. Data Catalog
    2. Foundational Hydrography Data Stewards
    3. DEM Hydro-modification
  - Vegetation
  - Education
  - Human Infrastructure
  - Data Acquisition

3DGeo - Data Acquisition Workgroup

Mission:

- The Data Acquisition Workgroup promotes procurement of foundational 3D data for Minnesota.



Co-Chairs

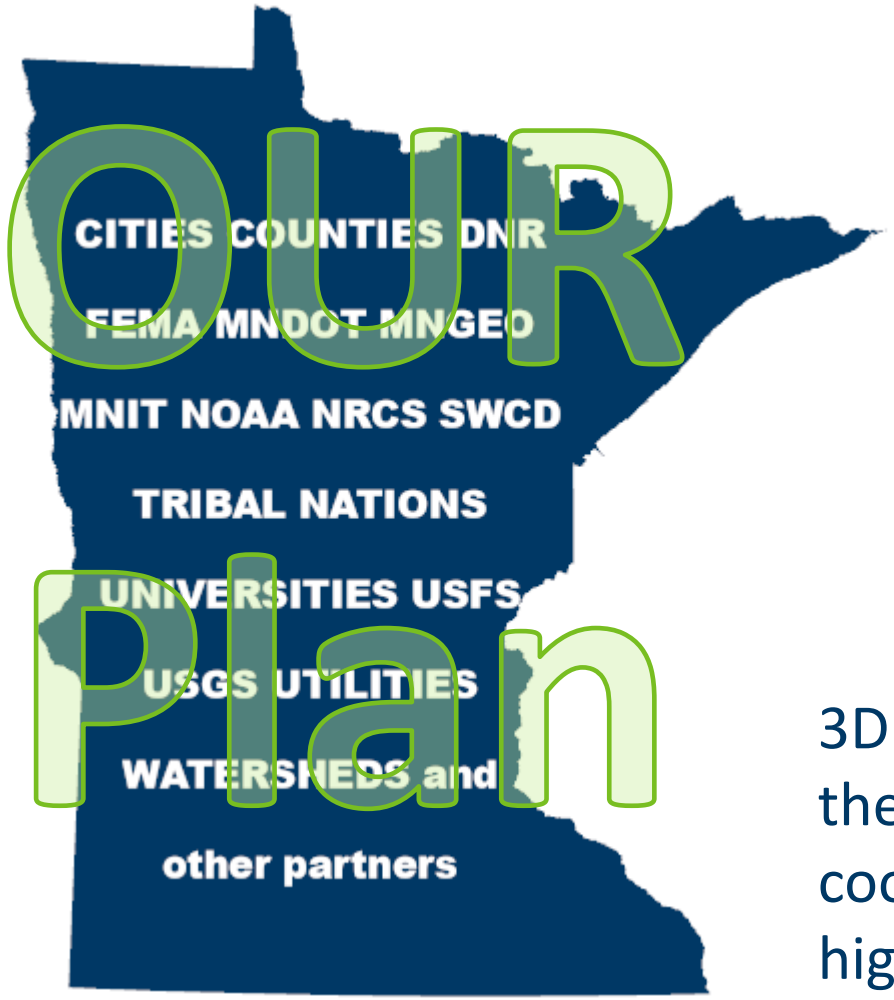
- Sean Vaughn, Alison Slaats, and Gerry Sjerven

Lidar Acquisition Subgroup:

- Alison Slaats (MnGeo), Sean Vaughn (MNIT DNR), Gerry Sjerven (MN Power), Dan Ross (MnGeo), Jennifer Corcoran (DNR), Colin Lee (MnDOT), Matt Baltes (NRCS), Joel Nelson (U of MN), Joe Sapletal (Dakota Co), Mark Reineke (Widseth), and Brandon Krumwiede (NOAA), Jeff Weiss (DNR).

Minnesota Lidar Plan

Minnesota Lidar Plan - Our Plan – Your Plan – One Plan

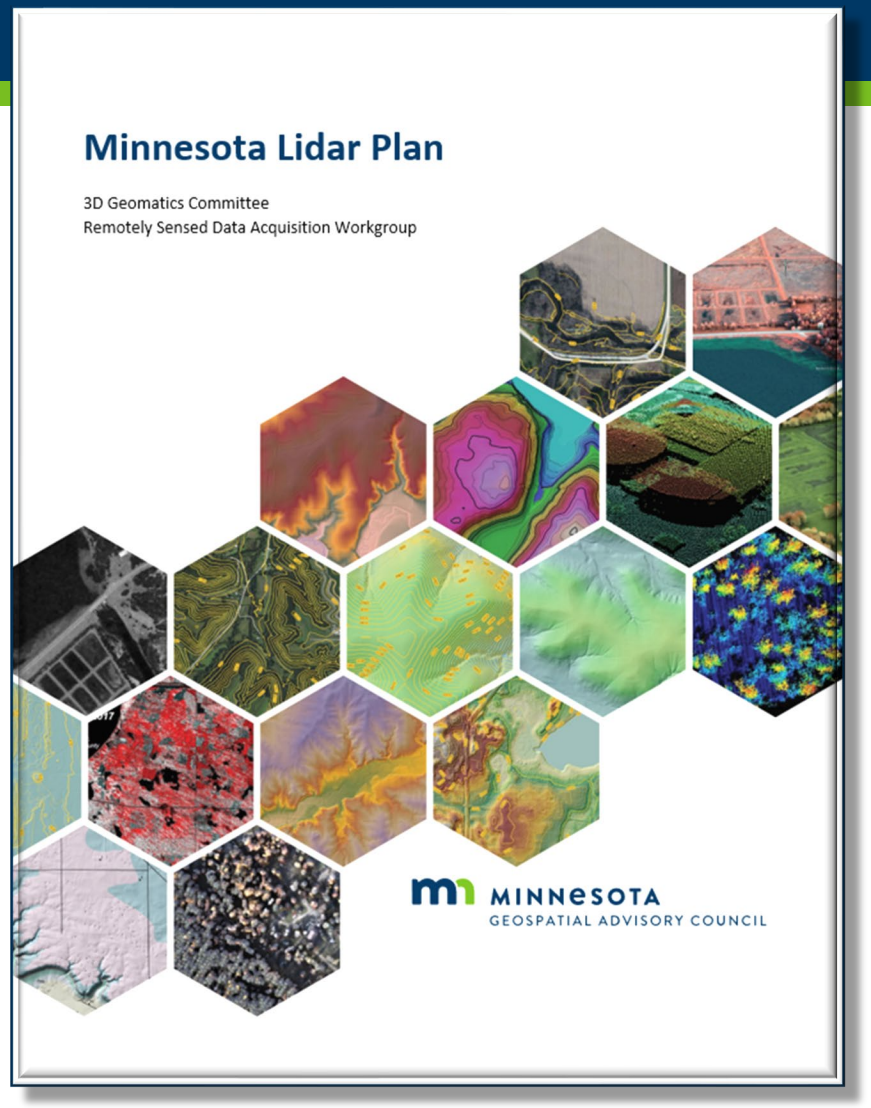


The Minnesota Lidar Plan

- **One** plan for Minnesota
- **Committee** led plan, not a state agency plan
- **Collaboration** of the geospatial community
- **Coordination** of lidar acquisition in Minnesota leverages federal match dollars

3DEP grant success is built on a guiding plan that pulls the community together to foster collaboration and coordinate funding to achieve the common goal of high density lidar acquisition across Minnesota

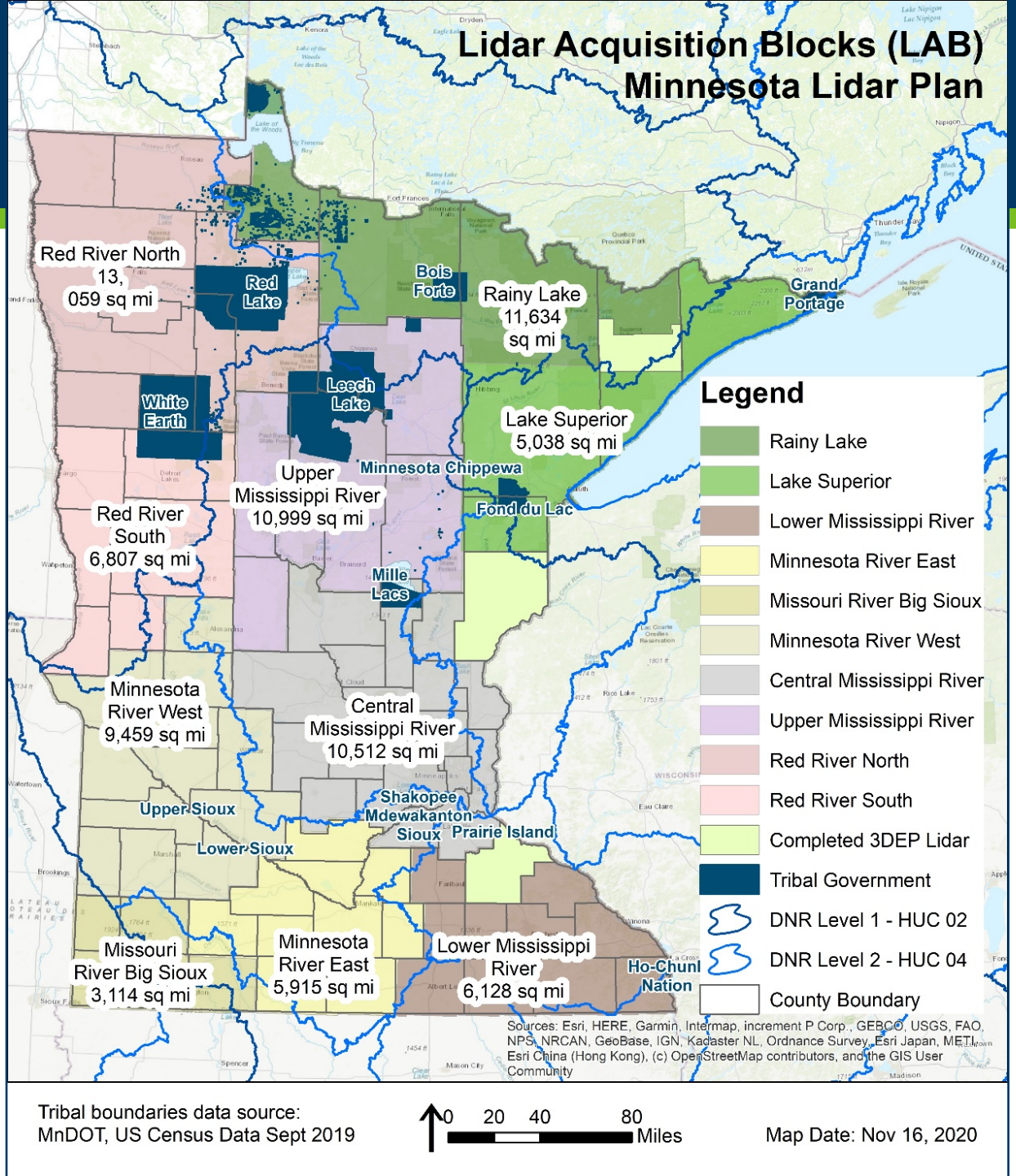
Minnesota Lidar Plan and StoryMap



https://www.mngeo.state.mn.us/committee/3dgeo/acquisition/Minnesota_State_Lidar_Plan.pdf

http://bit.ly/MnLidarPlanStoryMap

Lidar Acquisition Areas and Blocks of Interest

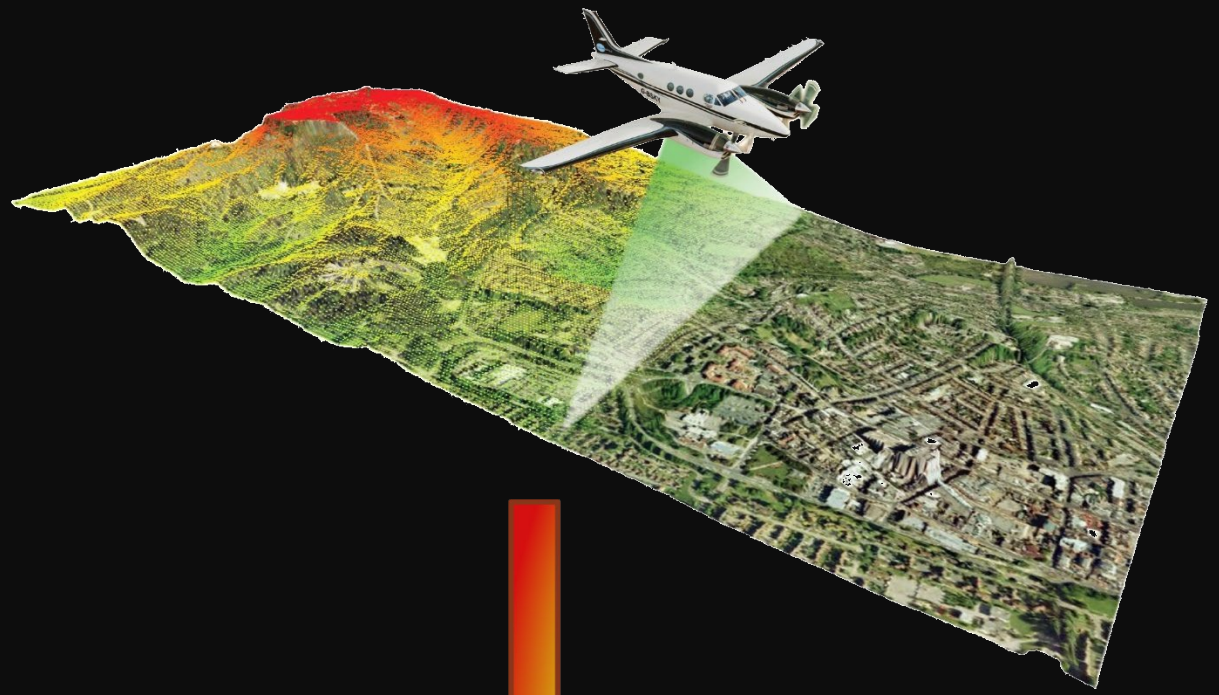


Lidar Planning – Background

- Lidar acquisitions are coordinated by the GAC's **3DGeo Committee**
- Minnesota's Lidar Plan divides up the state into **lidar acquisition areas** (LAA) based on political (county) and watershed boundaries
- **Grant funds** are available from USGS for lidar acquisition because there is a local-to-national scale need for a seamless nationwide DEM elevation layer
- 3DGeo is working to coordinate lidar acquisition with local, federal, and state **partnerships**
  - Leveraging **USGS federal funding opportunity**
- **Economies of scale** are achieved when partners collaborate across landscapes
  - The bigger the collection footprint, the lower the cost

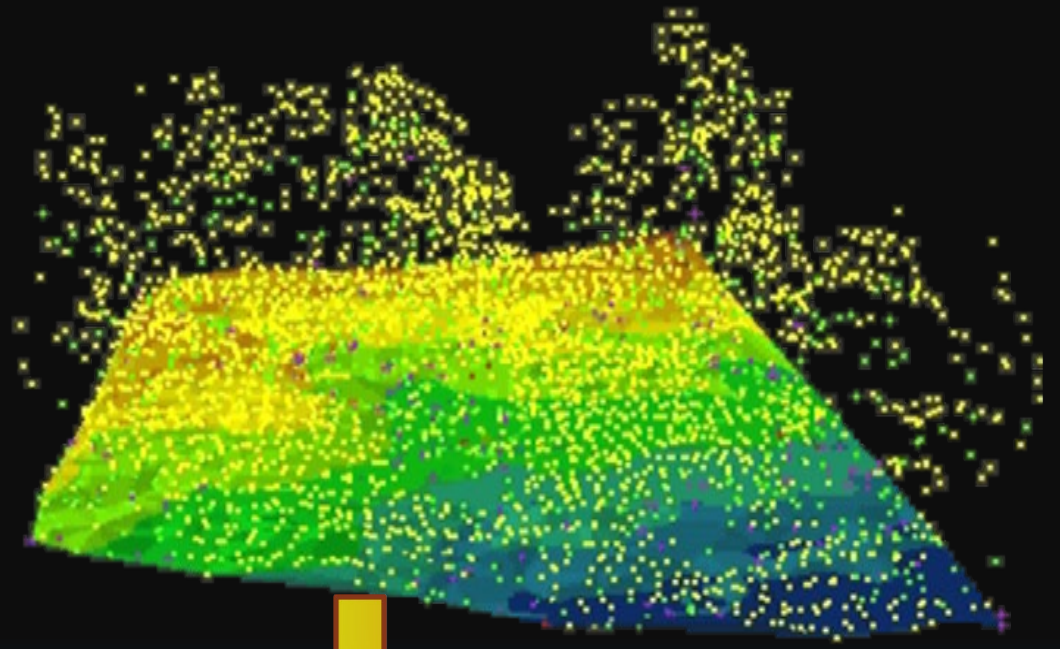
Lidar Acquisition → Point Cloud

Lidar Acquisition



Lidar Point Cloud

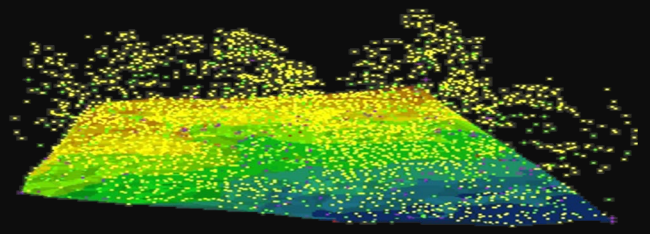
3D Rendition of Natural
and Built Environments



Lidar Classification

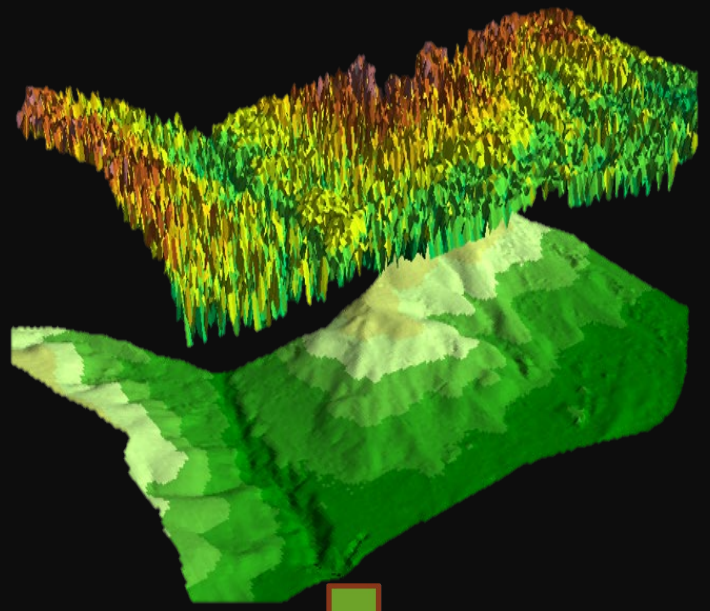
Painting the Lidar Point Cloud
Elevation Values

Lidar Acquisition → Point Cloud → Classification → DEM

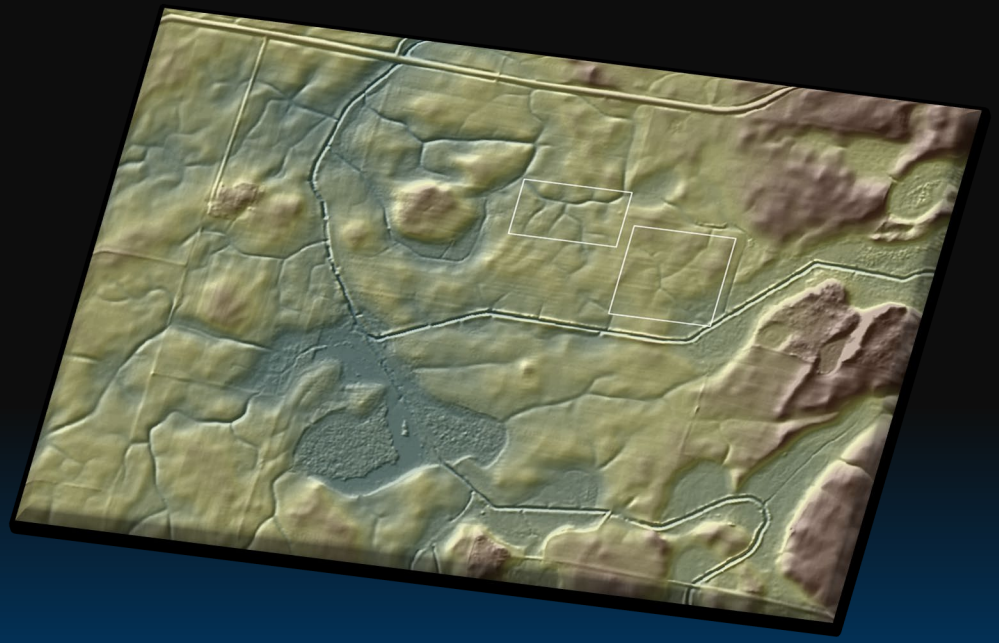


Lidar 3D Point Cloud

- Point Cloud Classification – Feature Identification and Separation of Data for Sector Application



LiDAR-derived 3D Digital Elevation Model (DEM)



What is Lidar?

To Some Lidar Is:

- **A 3D Point Cloud**

To Some:

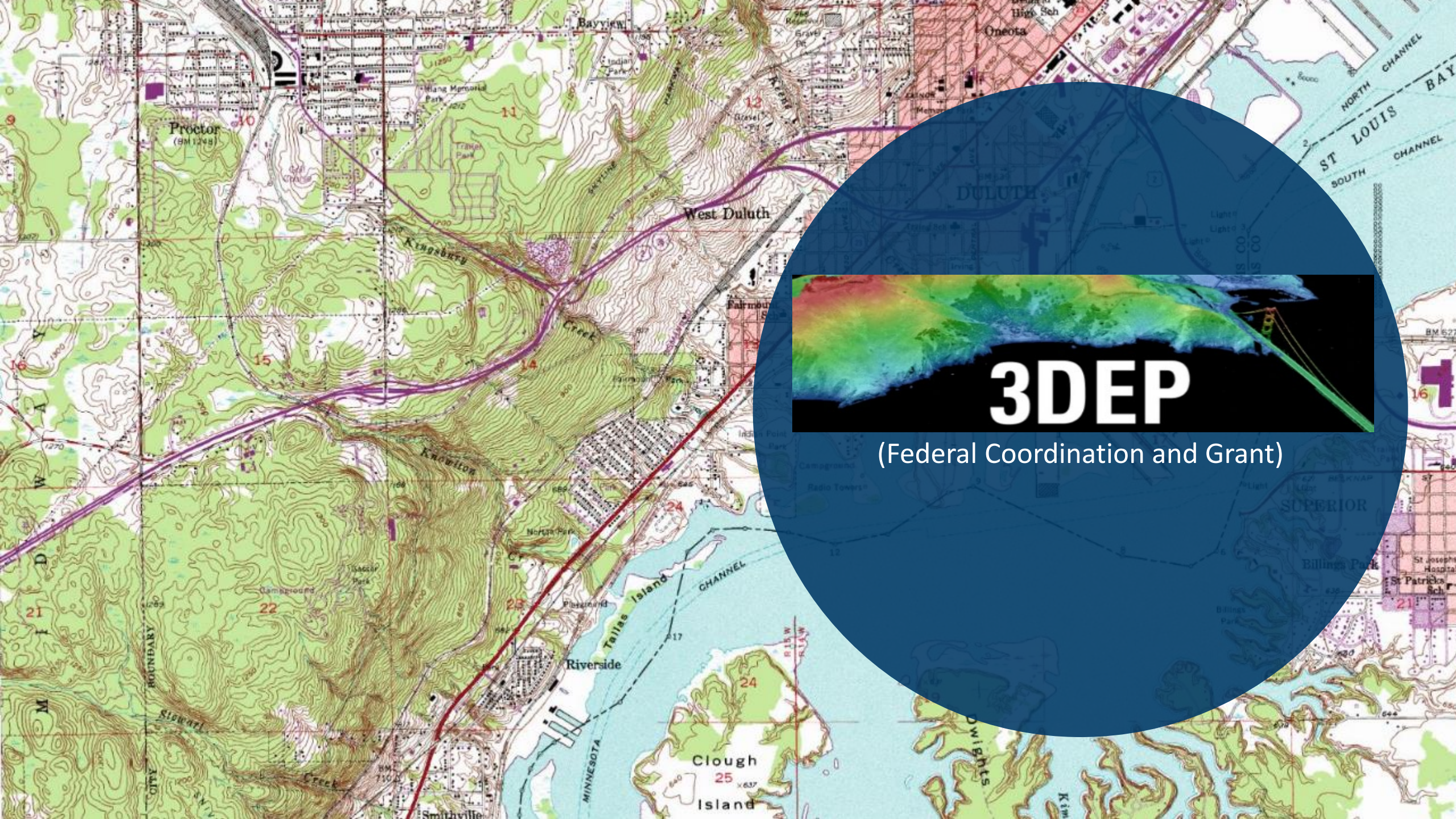
- 2-ft Contours
- Digital Elevation Model (DEM)

Note: The two most downloaded authoritative lidar-derived products from MnTOPO are the 2-ft Contours and the DEM.

To Some:

- Hydro-modified DEM & Hydrography
- 1-ft contour Dataset
- Vegetation and Buildings
- Intensity Imagery
- Digital Surface Model (DSM)
- And Many other products

Regardless what lidar is to you and your business needs, “lidar” begins with **collection of the lidar data** as part of a data procurement project, within a 3D Geomatics lidar acquisition block (LAB).



(Federal Coordination and Grant)

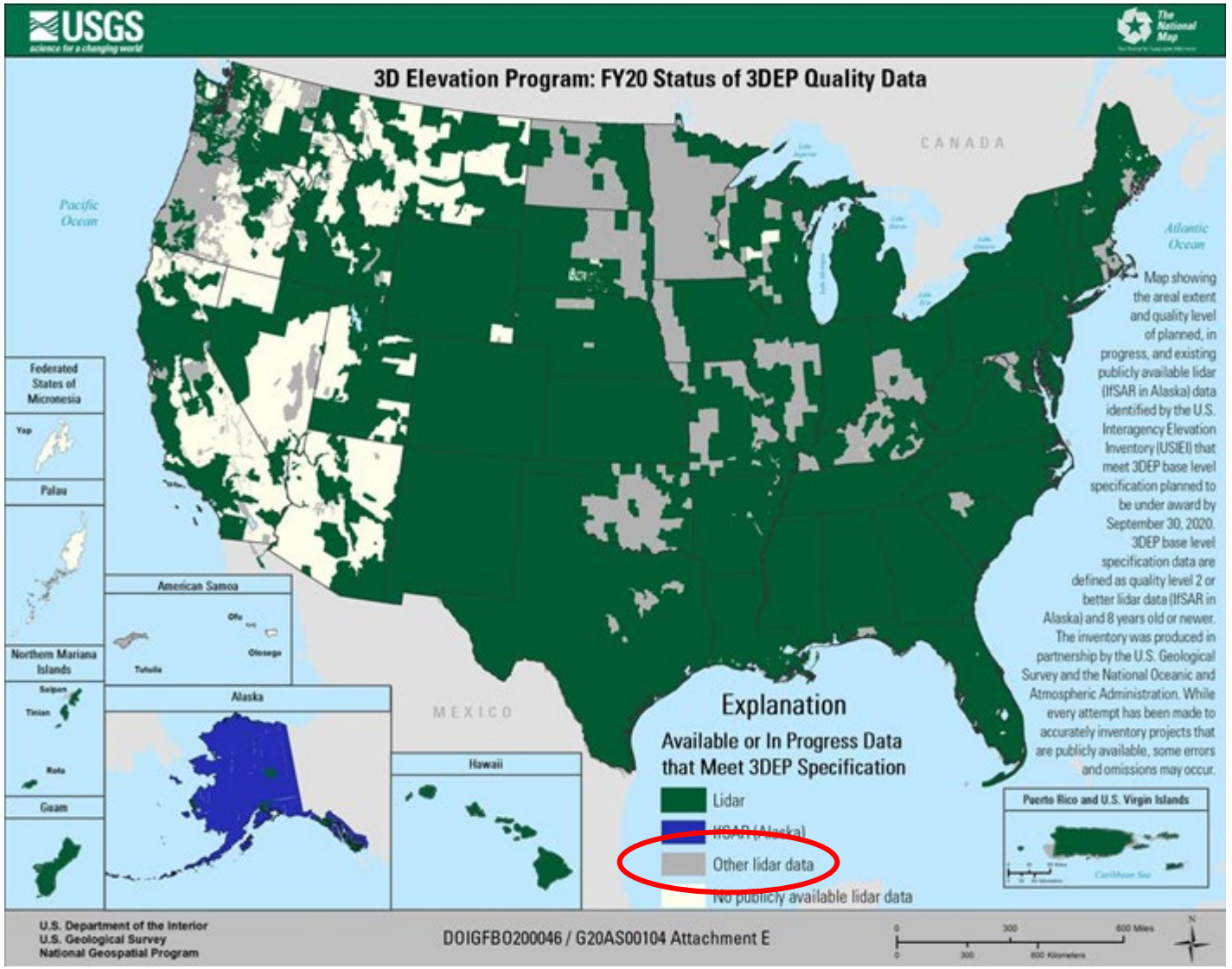
USGS 3D Elevation Program (3DEP)

3D Elevation Program (3DEP)

- **Systematically** guiding the collection of 3D elevation data in the form lidar data for the United States, and the U.S. territories

Broad Agency Announcement (BAA)

- **Grant coordinating** mechanism 3DEP
- Guides **partnerships** between the USGS and other Federal agencies with other public and private entities seeking high-quality 3D lidar elevation data acquisition.



USGS 3D Elevation Program (3DEP) - IGCE

Independent Government Cost Estimate (IGCE)

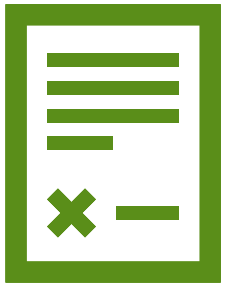
- Formal federal **contracting process**
  - The government is entitled to receive quality supplies and services at fair prices. Under normal market conditions, competing offers ensure that adequate value is received. The contracting officer relies on the IGCE to assist in the determination of the acquisition strategy, as well as an estimated cost for the proposed effort.
  - Uses vendor proposals, historical rates, and other information
- **Not unique** to this lidar acquisition project or 3DEP
- 3DEP BAA process uses **Attachment C** to solicit a PRELIMINARY Independent Government Cost Estimate.
- Due September 3rd
- Provides an estimate of project costs sufficient for project planning and partnership development.
  - A full and final IGCE will be completed after award

3D Geomatics Funding Agreements

Contributions to Minnesota Lidar (millions)

- Minnesota Partners: $3.15
- USGS 3DEP: $6.18
- Other Federal $0.448

Total: $**9.77**M



The State (MnGeo) Serves as the fiscal Agent with Minnesota Partners

- MnGeo will establish funding agreements with funding partners
- MnGeo will establish funding agreement(s) with USGS 3DEP

Lidar Quality Levels – Lidar Specifications

Three standards provide guidance and protocol documentation for lidar data procurement, processing, management, and accuracy assessment for certification.

1. **Positional Accuracy Standards for Digital Geospatial Data** [2014] – Developed by the American Society for Photogrammetry and Remote Sensing (**ASPRS**) to validate the positional accuracy data.
    - This nationally recognized document defines and categorizes vertical and horizontal accuracy of elevation data, which includes elevation data derived from lidar.
2. **Federal Geographic Data Committee** (FGDC) [1998] – Developed by the federal Office of Management and Budget Circular A-16 to promote the coordinated development, use, sharing, and dissemination of geographic data.

Lidar Quality Levels – Lidar Specifications

Three standards (continued)

3. **Lidar Base Specification** (LBS) [2013 to present version] – Developed by **U.S. Geological Survey** (USGS), through its National Geospatial Program (NGP) to support 3DEP lidar consistency across all USGS and partner-funded lidar acquisitions.

   - The LBS places particular emphasis on the development of **uniformly formatted and organized data**, as it moves from the vendor, to the USGS and into the hands of the funding partners.

   - Technical protocol outlined in the LBS supports the **entire data development process** from procurement to quality control, accuracy classification, data point classification, development of derived products, and data delivery to partners

Lidar Quality Levels – 3DEP Lidar Base Specifications

Tables 1-6 of the lidar base specification online, provide lidar specifications

- Aggregate nominal **pulse spacing** (m) and **pulse density** (pls/m2) are the same for QL1 and QL0 lidar.
- The required **absolute** non-vegetated vertical accuracy (NVA) and **absolute** vegetated vertical accuracy (VVA) of QL0 data is two times that of QL1 data.

Recently Recognized Criteria

- Positional Accuracy Standards for Digital Geospatial Data (ASPRS, 2014) require that the checkpoint survey used to verify vertical accuracy must be "***three times more accurate than the expected airborne lidar NVA***".
  - ✓ QL1 checkpoint survey must achieve a root mean square error in the z direction (RMSEz) of **≤ 3.33** cm for a 10 cm NVA RMSEz.
  - ✓ A QL0 checkpoint survey must achieve **≤ 1.67** cm RMSEz for a 5 cm NVA RMSEz. To achieve this level of accuracy, it is likely that QL0 checkpoint surveys will require static and redundant surveys rather than the RTK survey techniques commonly used

Lidar Quality Levels - Costs

	Quality Level (QL)	Average Cost per mi²*
No Longer Supported by 3DEP →	**QL-0**	**$N/A**
3DGeo QL0.5:30 (Goodhue) →	**QL-0.5:30**	**$440**
3DGeo Statewide Recommendation →	**QL-1**	**$330**
USGS Base Specification →	**QL-2**	**$200**
Current Statewide Lidar →	~~***QL-3***~~	~~***$175***~~

**Please note the following, regarding the above cost estimates:*

- *Estimates where obtained in 2020.*
- *These average estimates are based on a series of USGS 3DEP Independent Government Cost Estimate (**IGCE**) quotes. Actual cost estimates are subject to change based on a proposed area of interest.*
- *The 3DGeo Committee advocates for QL1 lidar and will assist partners to explore acquiring upgrades and additional derived products in their area of interest (e.g., QL0.5). An upgrade to point density or additional derived products will increase costs and will be the responsibility of the requesting partner(s).*
- *QL3 no longer meets USGS Base Specification, it is crossed out because it would not be purchased under this Lidar Plan.*

Quality Levels

USGS 3DEP Broad Agency Announcemnt (BAA) Statement of Work (SOW) & Task Order Lidar Acquisition Specifications

Lidar Quality Levels Adopted from 3DEP Lidar Base Specification (LBS)	**LBS Table-2: Aggregate Nominal Pulse Spacing (ANPS)** [m]	**LBS Table-2: Aggregate Nominal Pulse Density (ANPD)** [pulse/m^2]	**LBS Table-4: Absolute Vertitcal Accuracy RMSEz** (Non-vegetated) [m] *Alternative Units* ([cm] / [in] / [ft])	**ASPRS Checkpoint Vertical Survey Requirement** 3-times More Accurate than Non-vegetated RMSEz (3xRMSEz) [m] Alternative Units ([cm] / [in] / [ft])	**LBS Table-6: DEM Cell Size** [m]	**Delivered Point Density** [point/m^2]	**Cost Estimate Based on formal 2020 IGCE** (expected to be updated in September 2021) [$mile^2$]
QL0 *(ASPRS Accuracy Compliant QL0)*	≤ 0.35	≥ 8.0	≤ 0.05 m ≤ **5.0** cm ≤ 1.969 in ≤ 0.164 ft	≤ 0.017 m ≤ **1.667** cm ≤ 0.656 in ≤ 0.055 ft	0.5 m	≥ 8.0	Not Supported by 3DEP
QL0 *(ASPRS Accuracy Compliant QL0)* [LeSueur and Olmsted Counties]	≤ 0.35		≤ 0.05 m ≤ **5.0** cm ≤ 1.969 in ≤ 0.164 ft	≤ 0.017 m ≤ **1.667** cm ≤ 0.656 in ≤ 0.055 ft	0.5 m	**≥ 30.0**	Unknown at this time, we hope to learn more by end of year from vendors efforts this fall
3DGeo QL0.5:30 (Goodhue County Lidar Criteria)	≤ 0.35	≥ 8.0	> 0.05 m to < 0.10 m > **5.0** cm to < **10.0** cm > 1.969 in to < 3.937 in > 0.164 ft to < 0.328 ft	> 0.0167 m to < 0.0333 m > **1.667** cm to < **3.333** cm > 0.656 in to < 1.312 in > 0.055 ft to < 0.109 ft	0.5 m	**≥ 30.0**	**$440**
QL1 *(ASPRS Accuracy Compliant QL1)*	≤ 0.35	≥ 8.0	≤ 0.100 m ≤ **10.0** cm ≤ 3.937 in ≤ 0.328 ft	≤ 0.033 m ≤ **3.333** cm ≤ 1.312 in ≤ 0.109 ft	0.5 m	**≥ 30.0**	No 2020 IGCE. Requires a 2021 IGCE submission to obtain a cost/m^2.
QL1 *(ASPRS Accuracy Compliant QL1)*	≤ 0.35	≥ 8.0	≤ 0.100 m ≤ **10.0** cm ≤ 3.937 in ≤ 0.328 ft	≤ 0.033 m ≤ **3.333** cm ≤ 1.312 in ≤ 0.109 ft	0.5 m	≥ 8.0	**$330**

What is: High-density Lidar

Need for New High-density Lidar

- **Update** our existing Lidar data holdings which are now a decade old.
- **Improves** our ability to analyze the landscape in Minnesota, map assets, and assess resources
- Provides the foundation for development of updated authoritative **derived products** to support analysis and informed decision-making
- Enables practitioners, managers, and researchers to be more **proactive** than reactive.

Lidar point cloud colorized by photograph pixel colors

3DEP Standard Deliverables

- **Point Cloud** (classified to minimum level – meets most needs; data hosted online)
- Digital Elevation Model (**DEM**/Bare-Earth Surface Raster)
- Lidar Swath Polygon
- **Hydro**-breaklines
- Metadata & Reports

3DEP Program – Upgrades and Enhancements

Possible Added Deliverables

- **Possible deliverables not funded by 3DEP, but can be part of the 3DEP contract as additional products and services with the 3DEP contract vendor at an additional cost**
  - Higher density Point Cloud
    - 3DGeo advocates for QL1, **partners may upgrade areas to QL0**
  - Improved hydrographic products
    - ✓ Advanced **hydro-modified DEM** (Conditioned DEM), and/or hydro-flattening
  - Bare Earth point cloud
  - Additional Point Classification
    - ✓ High vegetation and **buildings**
  - **Intensity** imagery, GeoTIFF

State Agency Deliverables - Lidar Derived Products

Foundational Derived Products

- **Publicly available data served as authoritative products from state agency distribution portals**
  - 1-ft **Contour** Dataset
  - **Hillshaded** DEM
  - **Canopy Height** Model (CHM)
  - Other products to come?

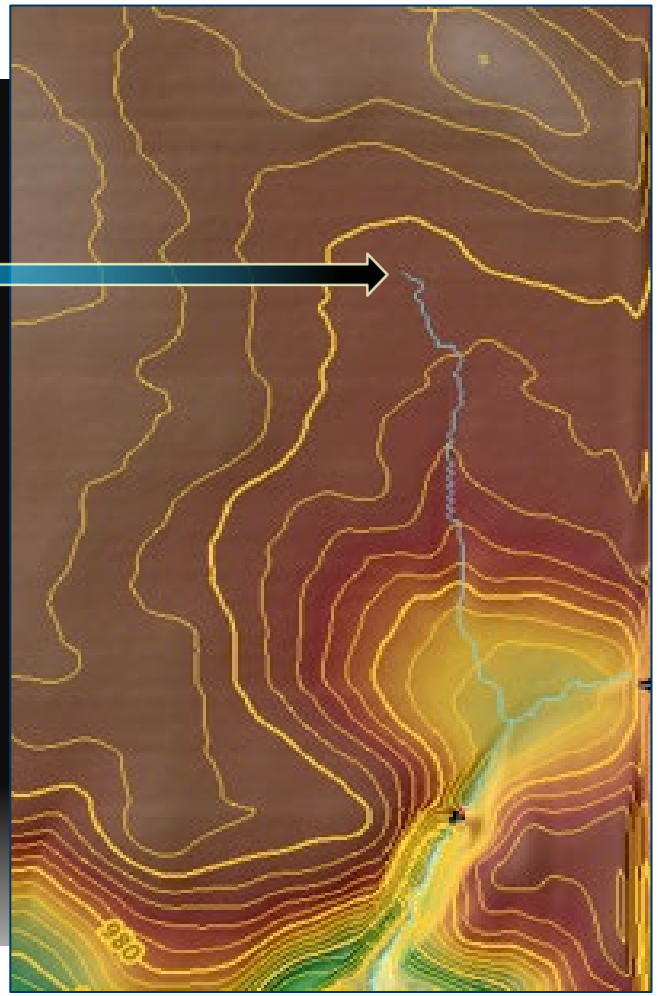
HD Lidar – Derived Products - Hydrography Example

WATER CONVEYANCE LANDFORMS

Mapping the Unmapped Hydrography

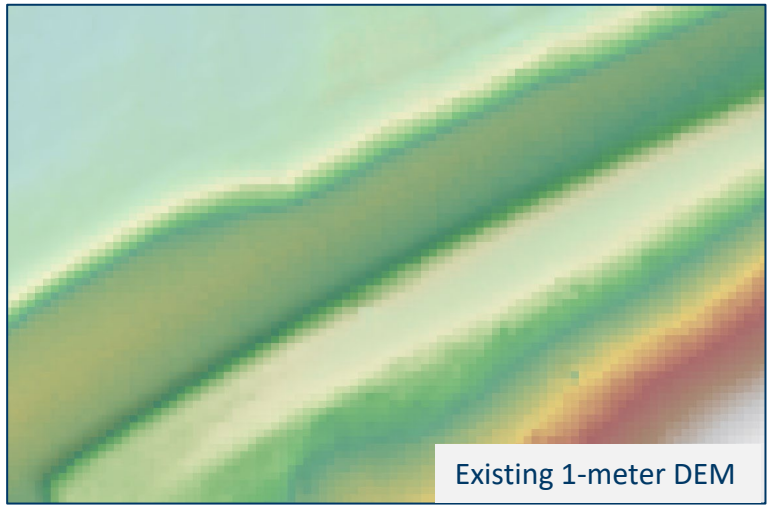
- Features of hydrologic Significance.
  - Nickpoint
  - Fluvial Processes
  - Soil Degradation
- Where does the watercourse begin ?
  - Where concentrated flow begins. LiDAR captures these landform.

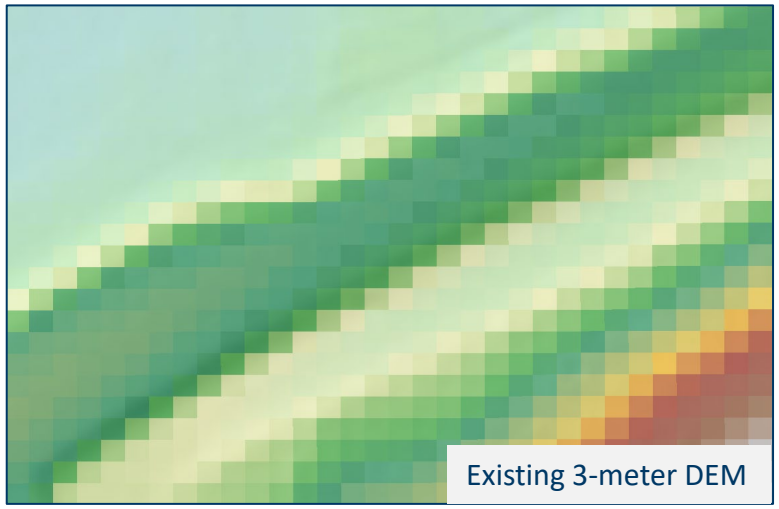
We Model this with DEMs

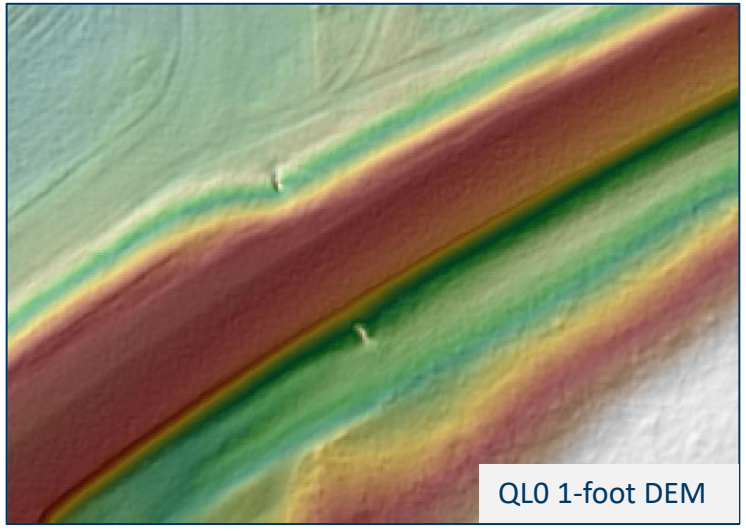


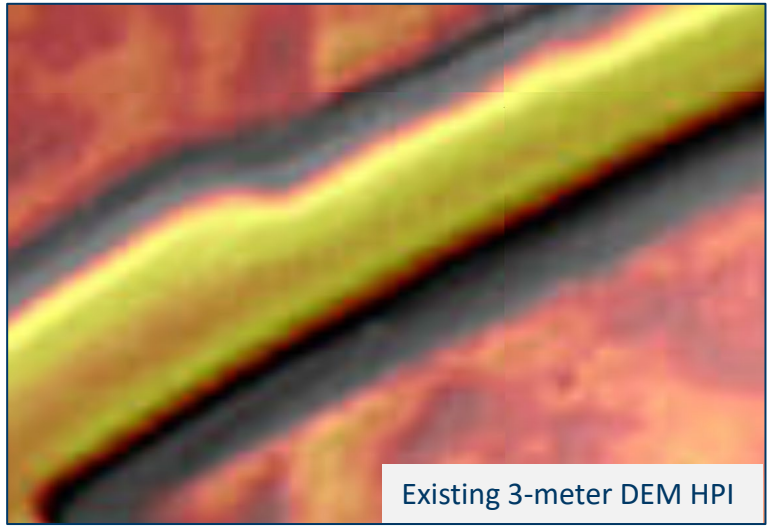
HD Lidar Examples: Hydrography & Infrastructure

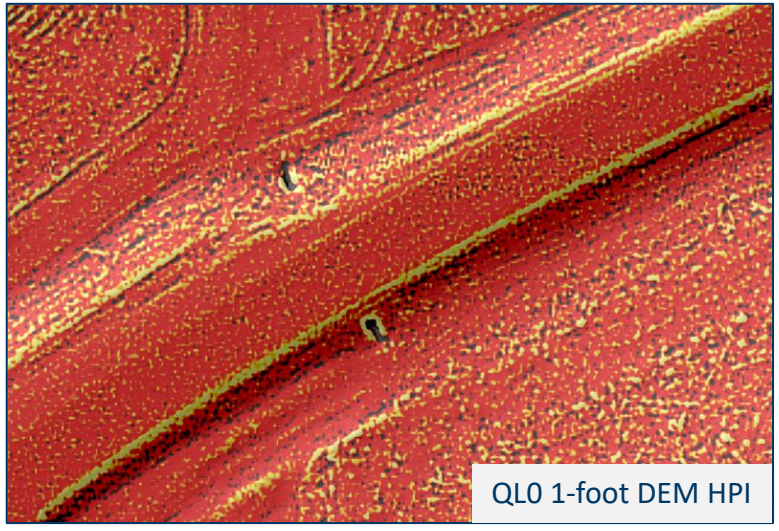
Culvert Capture High Density QL0 (30pts/m^2)





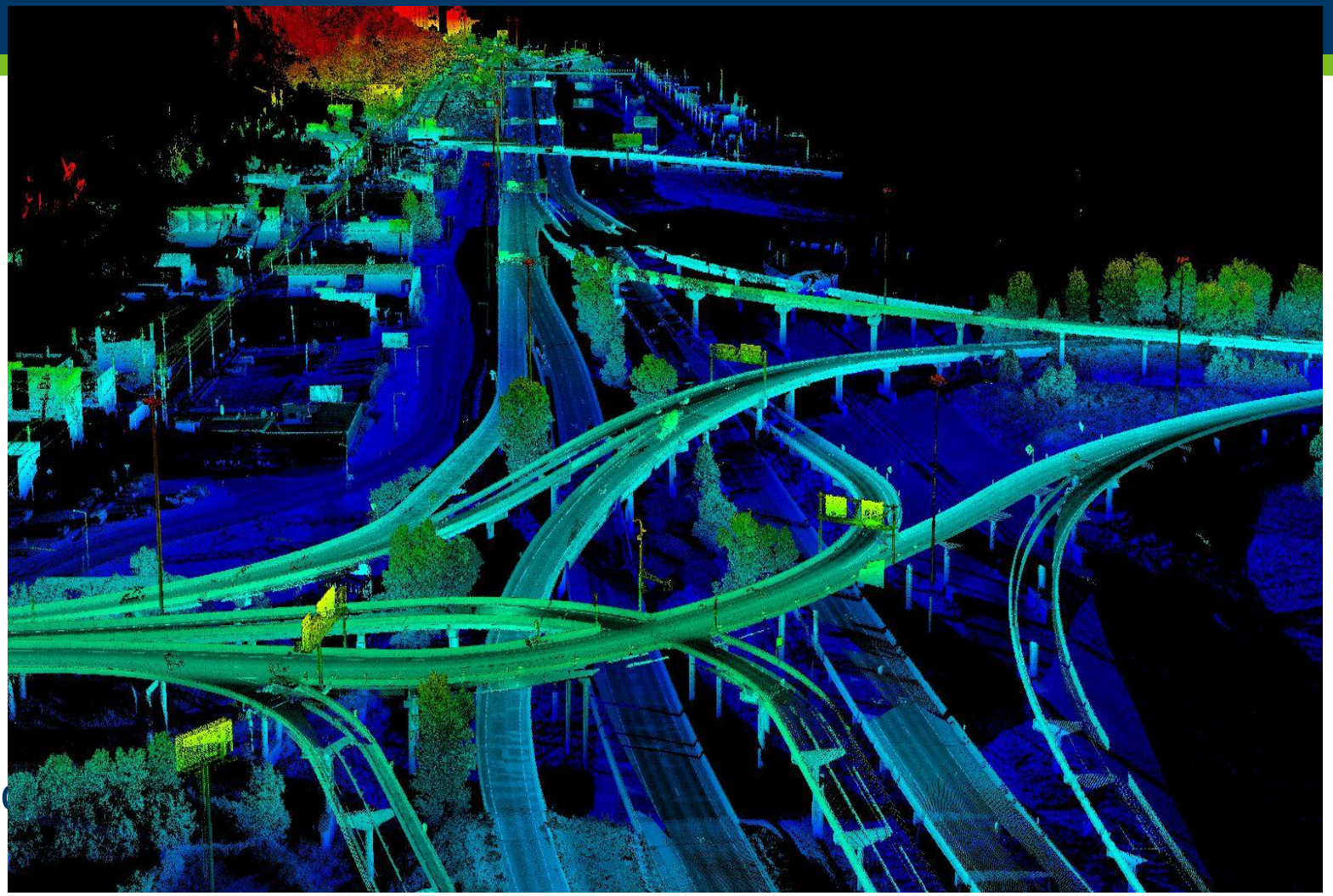






HD Lidar Examples: MnDOT Infrastructure

- Transportation
  - 3d Design
  - Traffic operations
  - Signing and striping
  - Highway safety
  - Maintenance
  - Asset management
- Energy
  - Traditional
  - Renewable/Alternative
- Cultural/Historical Resour

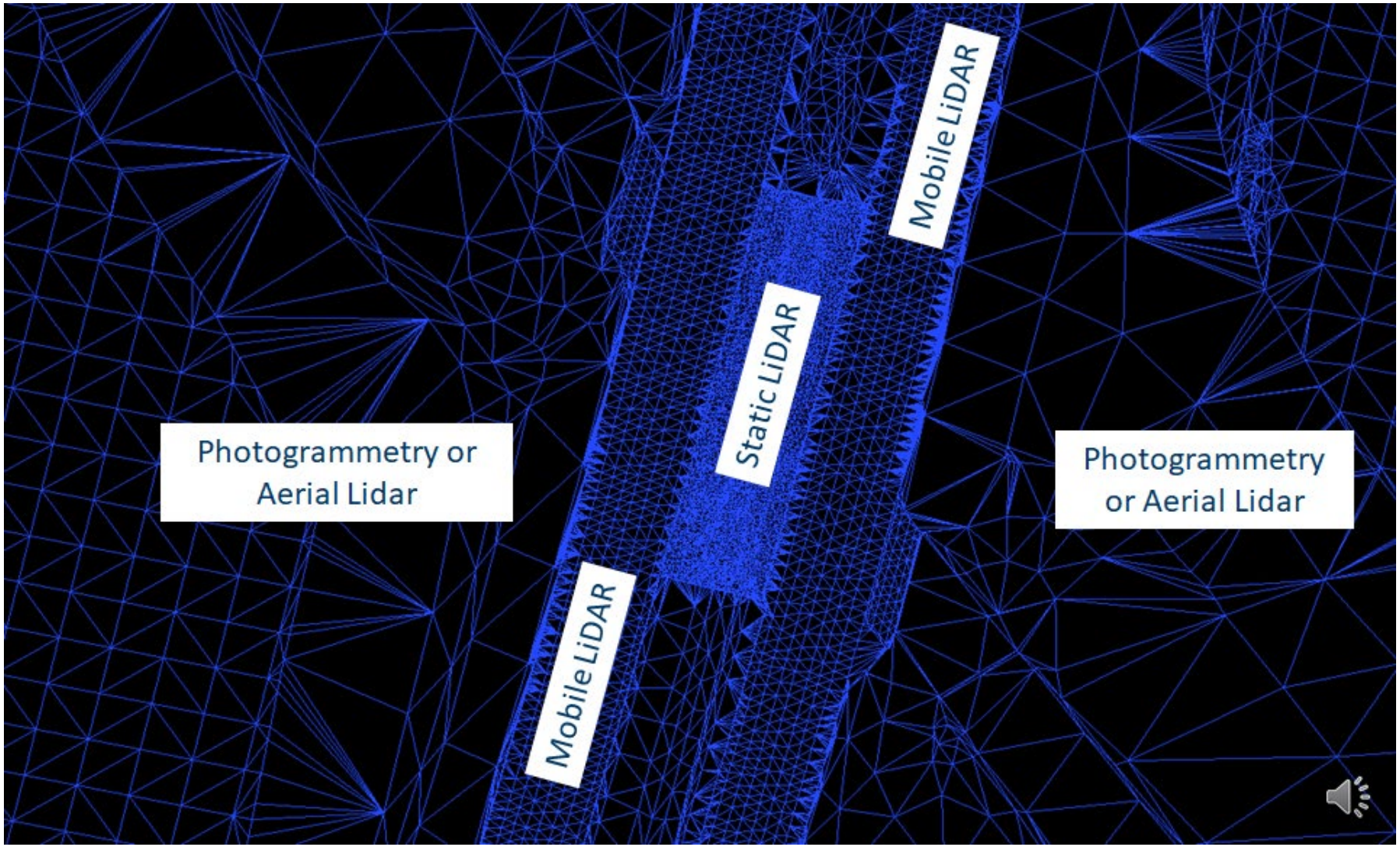


The I-35/Highway 53 interchange in Duluth, MN (known locally as the "Can of Worms")

HD Lidar Examples: MnDOT Infrastructure

Supporting Corridor Mapping

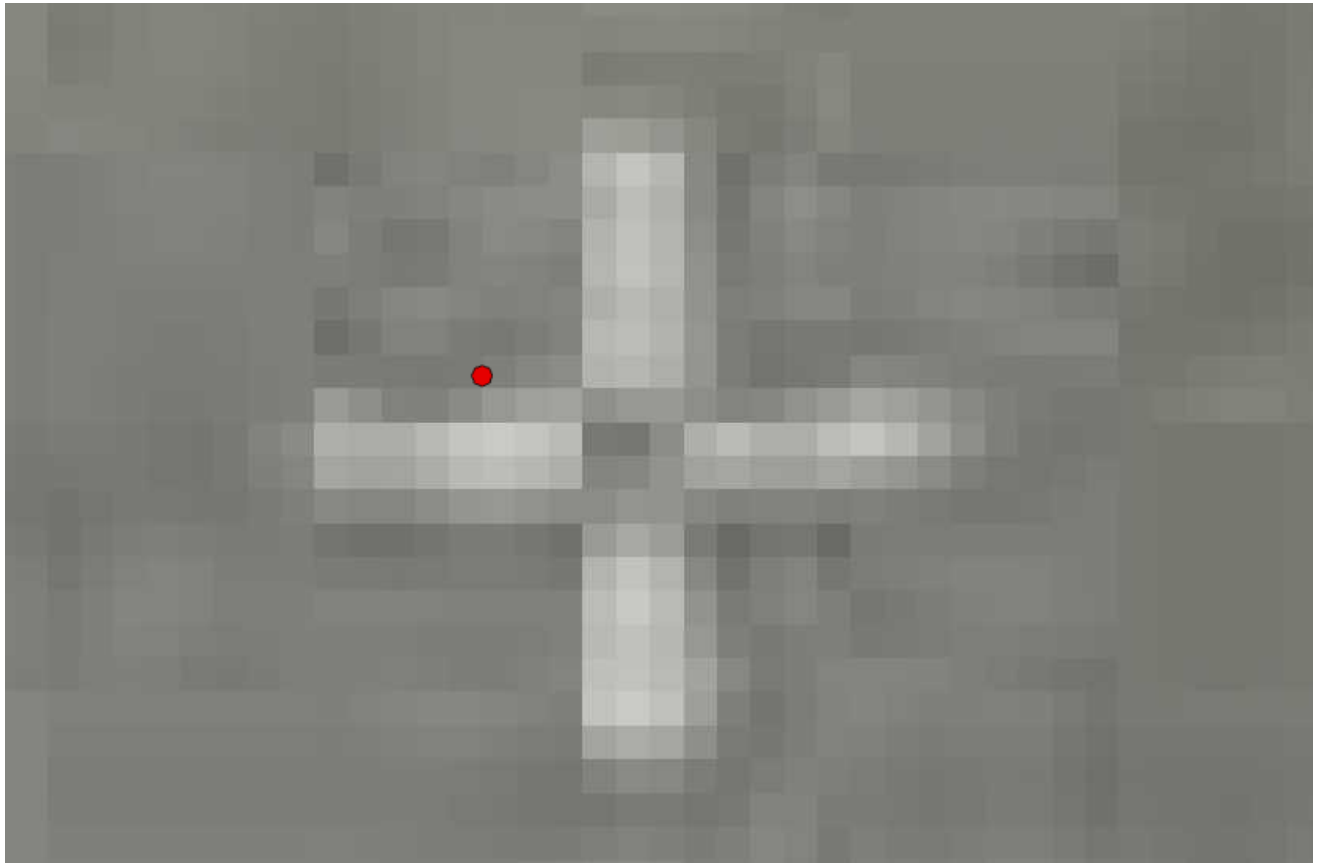
- New HD lidar can replace existing mapping methods
- Existing lidar no longer reliably supports many engineering products
- New lidar could supplement these types of mapping projects for up to 80% saving in time.



HD Lidar Examples: Infrastructure

Supporting Orthomosaic Creation

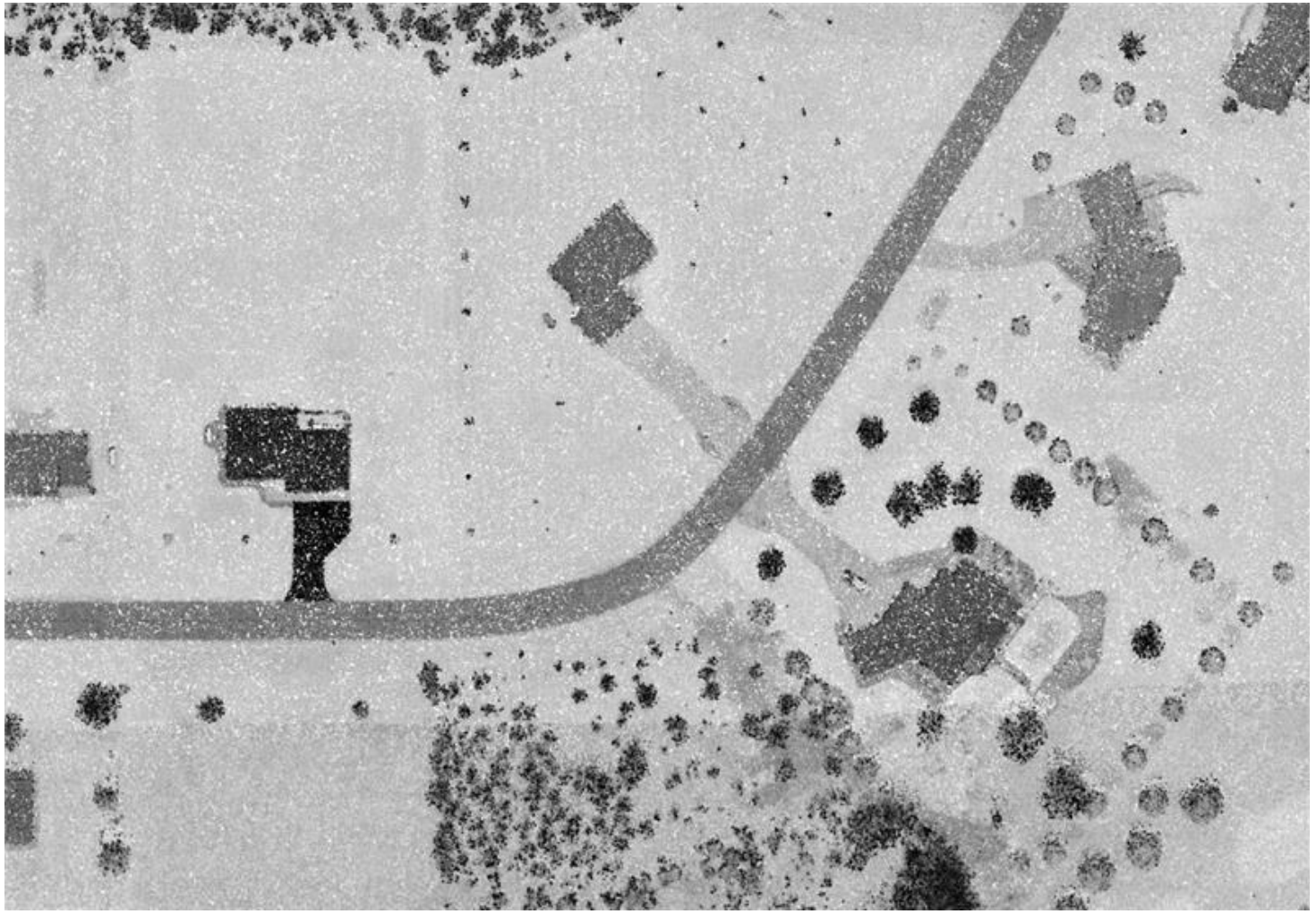
- New HD lidar can replace existing mapping methods
- Existing lidar no longer reliably supports the creation of high resolution orthophotos



HD Lidar Examples – Lidar Intensity

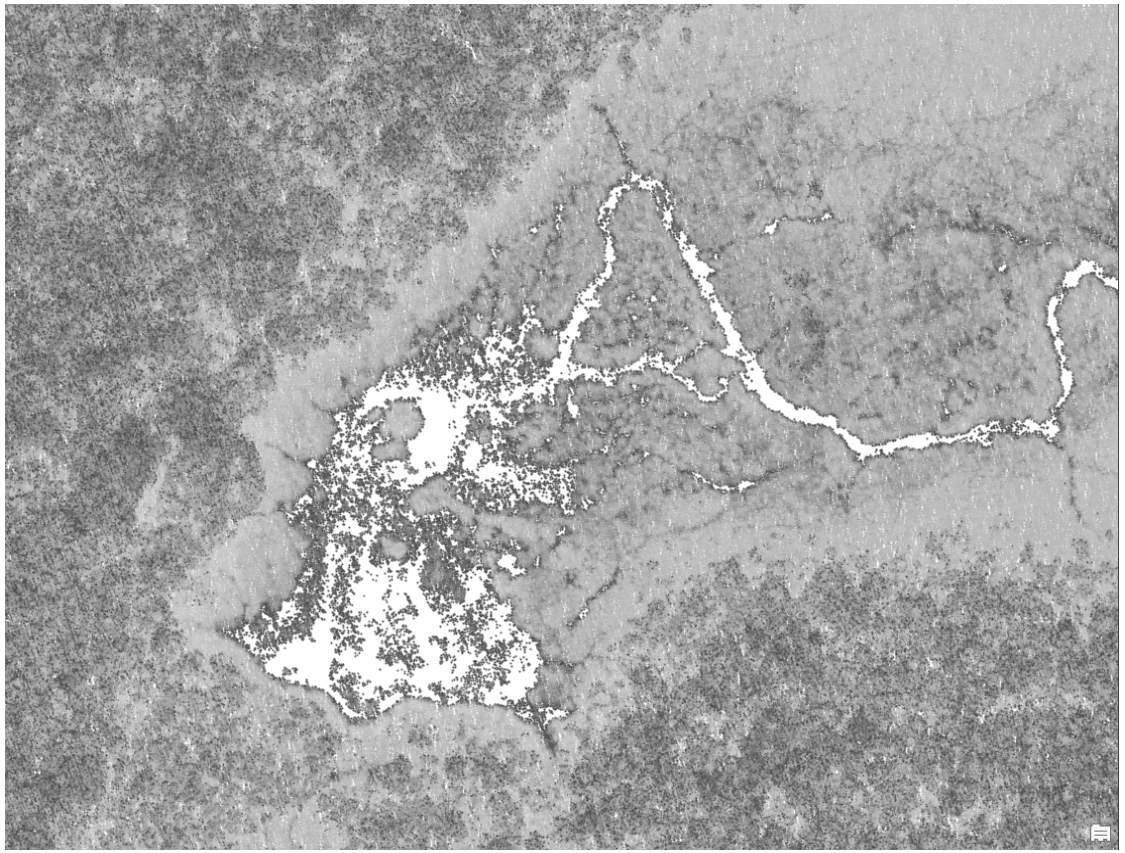
High Density QL0 (30pts/m^2)

QL0 1-foot DEM HPI



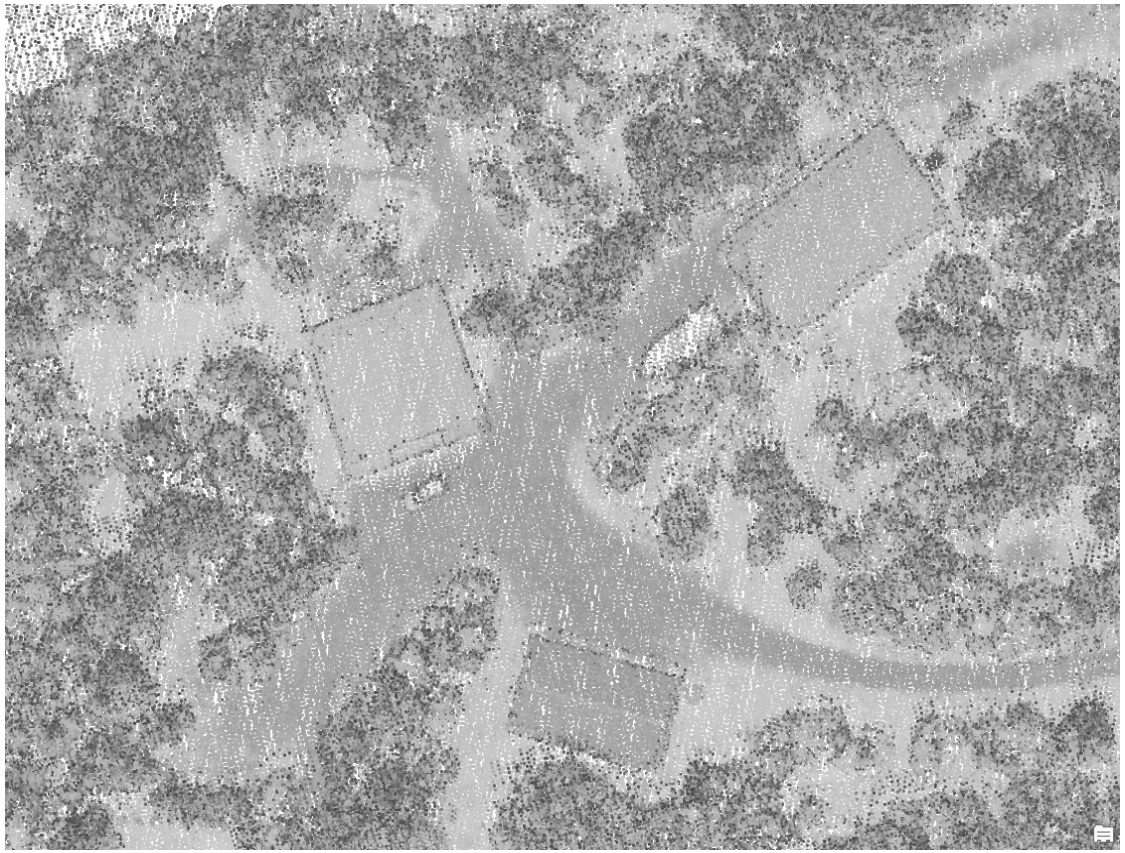
HD Lidar Examples - Lidar Intensity

NE Forested LAA, **QL1 Lidar Intensity** - **Hydrography Capture**



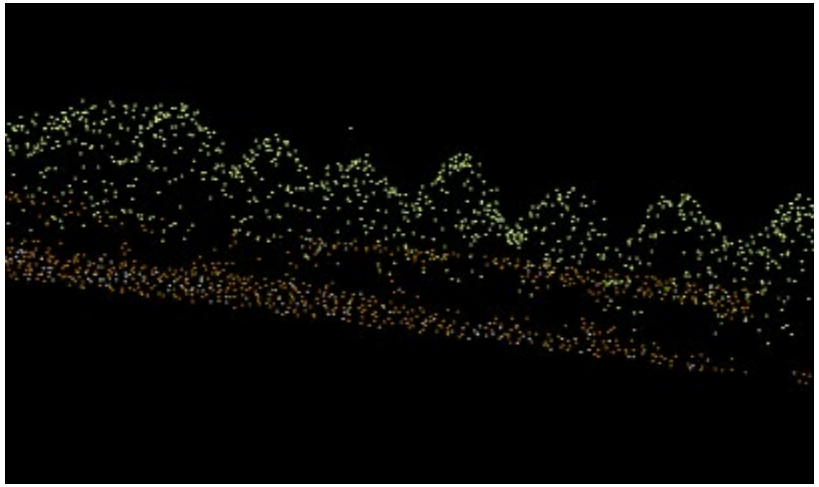
HD Lidar Examples - Lidar Intensity

NE Forested LAA, **QL1 Lidar Intensity** - **Infrastructure Capture**

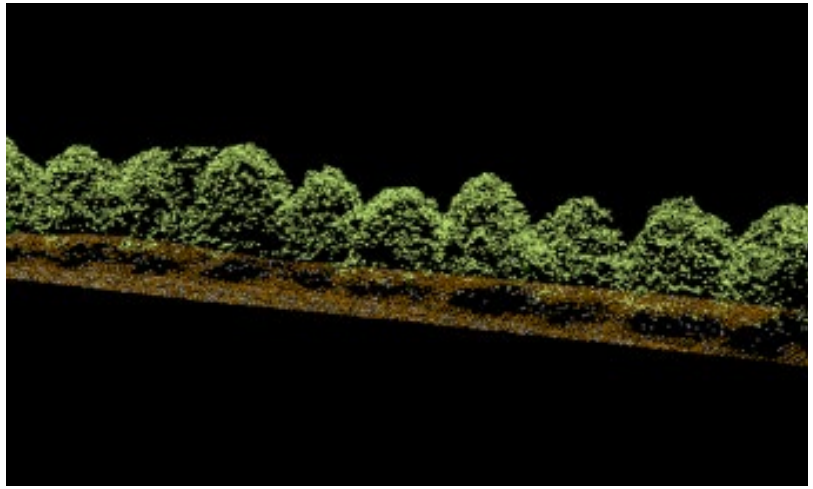


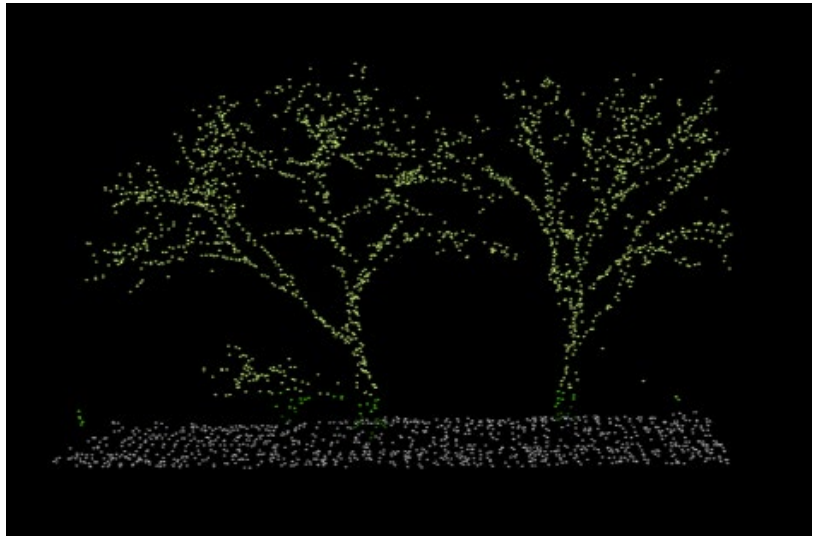
HD Lidar Examples: **Vegetation Mapping**

Low Density (QL3, 1ppm)



High Density (QL1, 8+ppm)





HD Lidar Examples: Floodplain Mapping
(Hydro, Infrastructure & Forest)

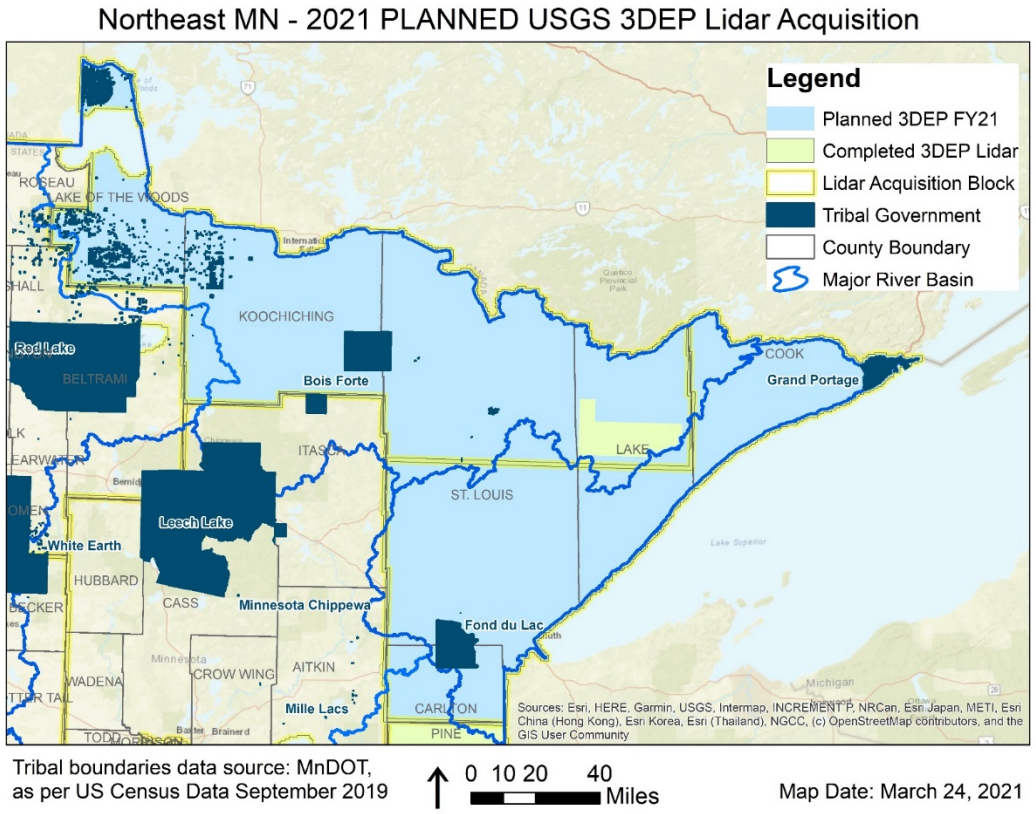
2021 - Progressive Approach

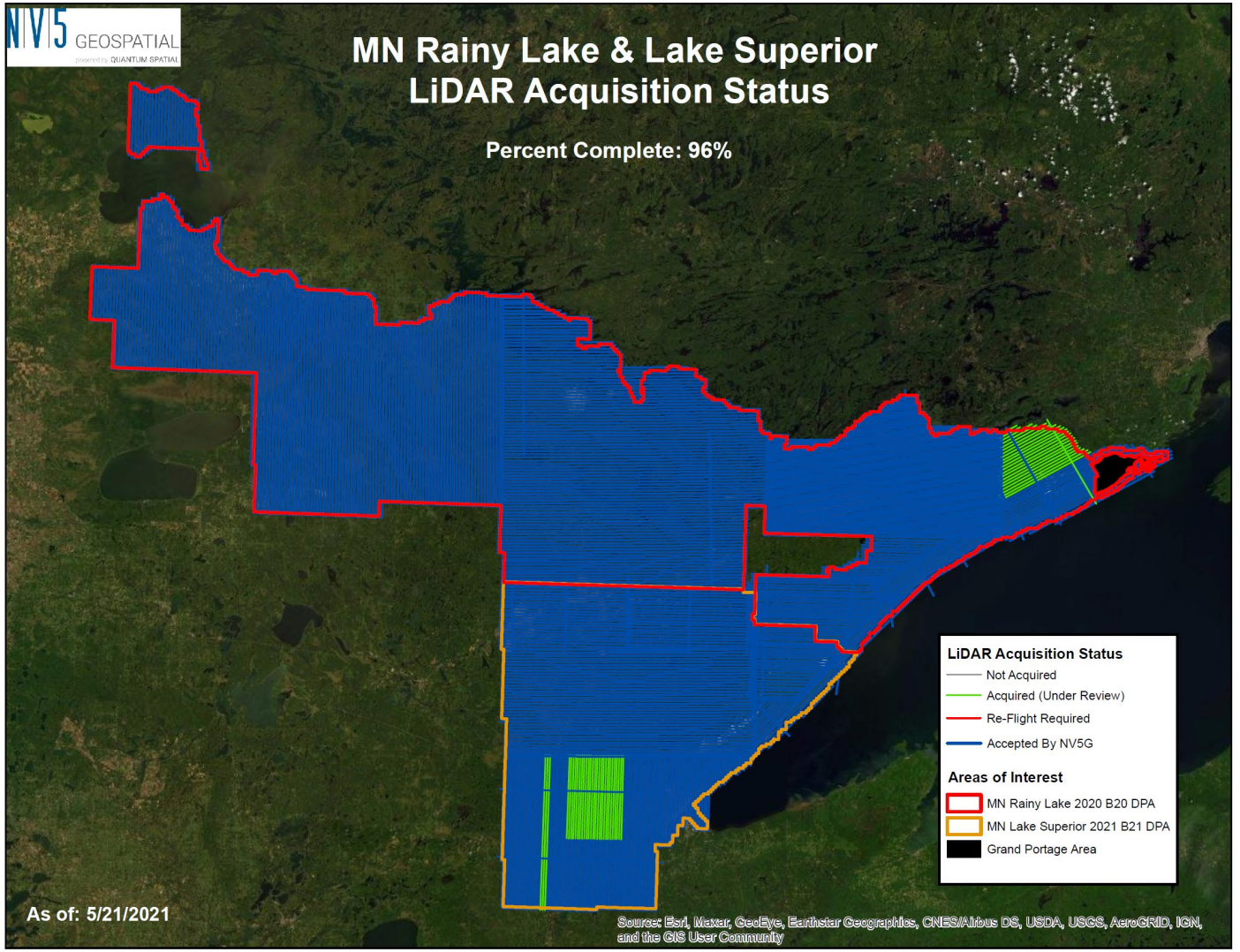
- New high density lidar not only maps this area of flood inundation but it **maps all the infrastructure assets** in the image.
- We have an opportunity to be **proactive** and map this entire scene.


Next: Lidar
Collect

Lidar Acquisition: *Northeast – Rainy Lake & Lake Superior Block*

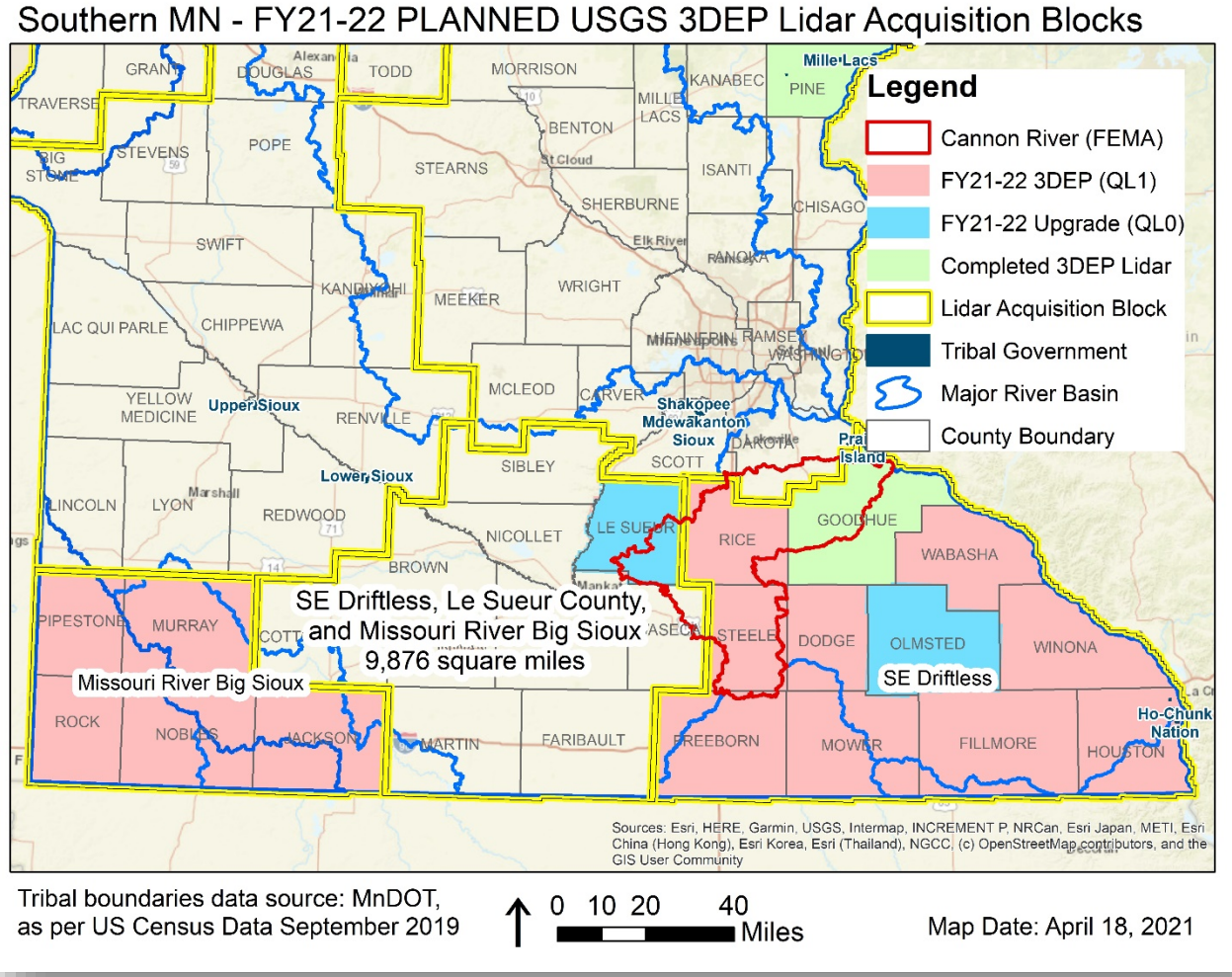
- Rainy Lake and Lake Superior Block data collections are almost done!





Lidar Acquisition: *Southern BAA – Missouri Big Sioux & SE Driftless Blocks*

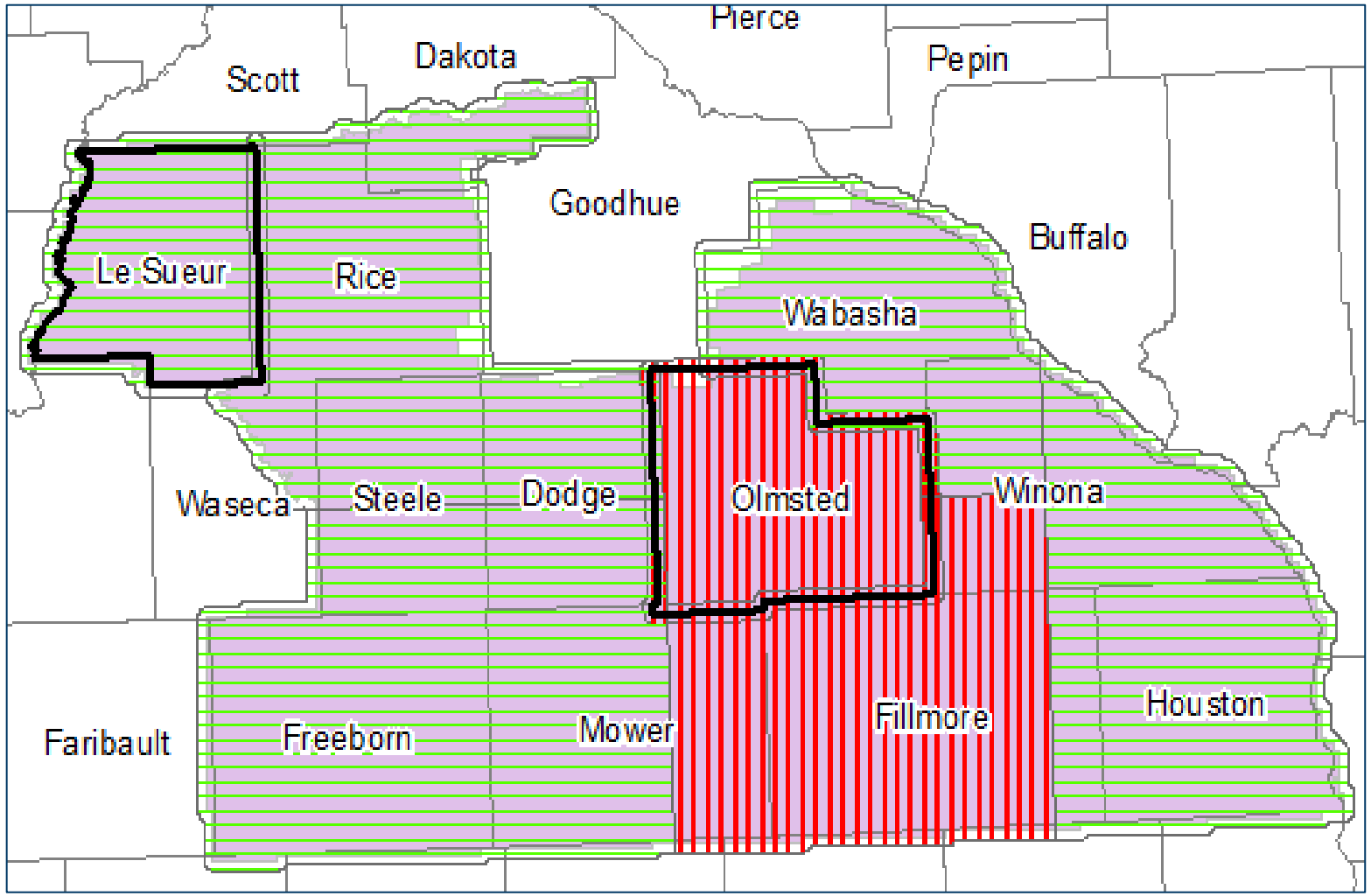
- BAA (west and east) split between two vendors and two JFA's.
  - Partners: USGS, NRCS State and Federal Offices, MnDOT, MnGeo, and Nobles, Le Sueur, Olmsted (included City of Rochester), and Winona (included City of Winona) Counties
- Lidar collection occurring now in SE Driftless LAA
- Missouri River Big Sioux block set for a Spring 2022 collection



Lidar Acquisition: *Southern BAA – Missouri Big Sioux & SE Driftless Blocks*

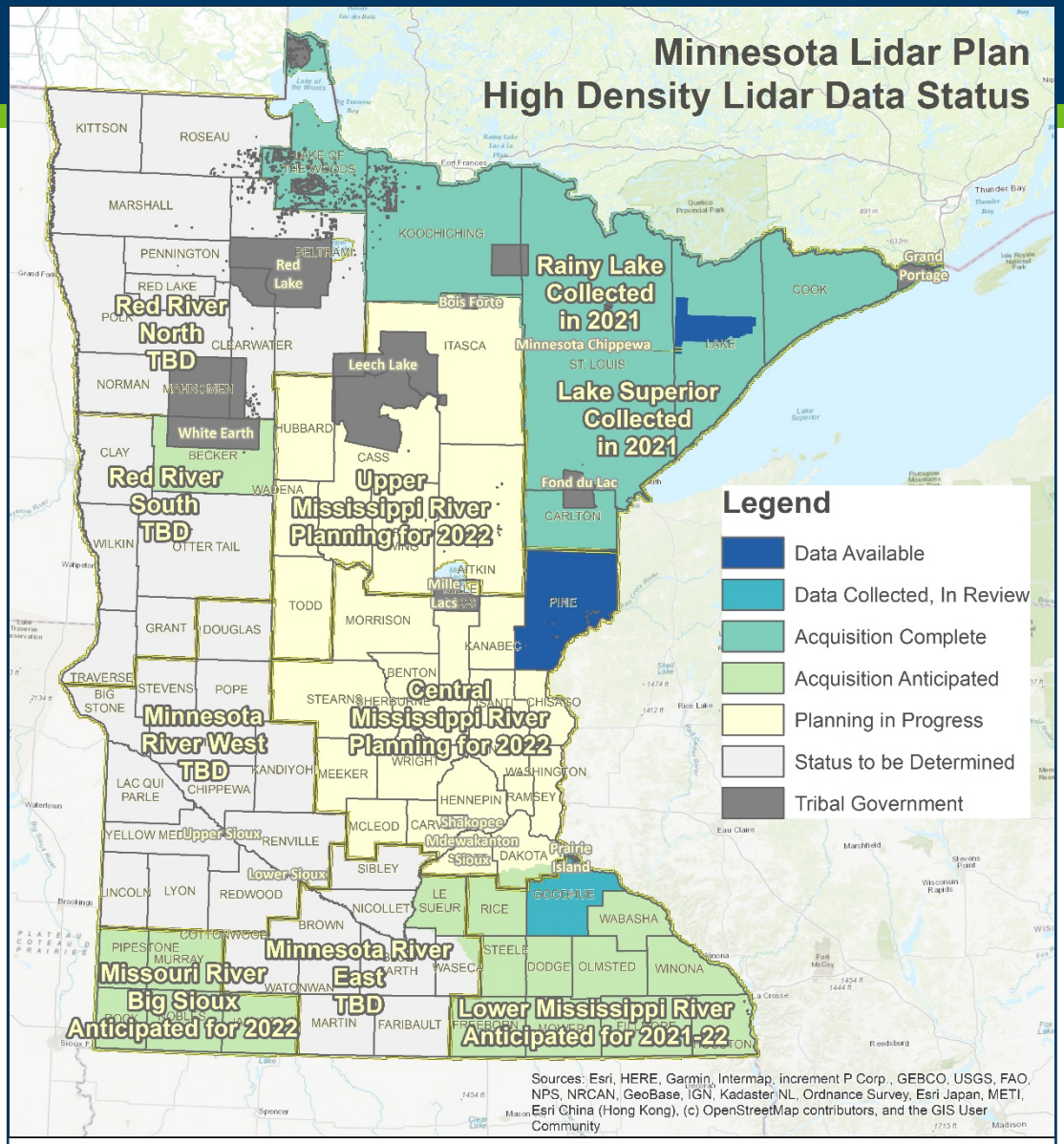
Description

- Vendor was able to put aircraft on this project following completion of a nearby job.
- Collection was outside of contract, but vendor understands lidar base specification and the QC the data must met for certification
- QL0 Counties
  - ASPRS Compliant QL0 Lidar
  - Will meet **1.67** cm RMSEz Non-veg accuracy for check points




Planning in
Progress

Lidar Acquisition Areas and Blocks of Interest

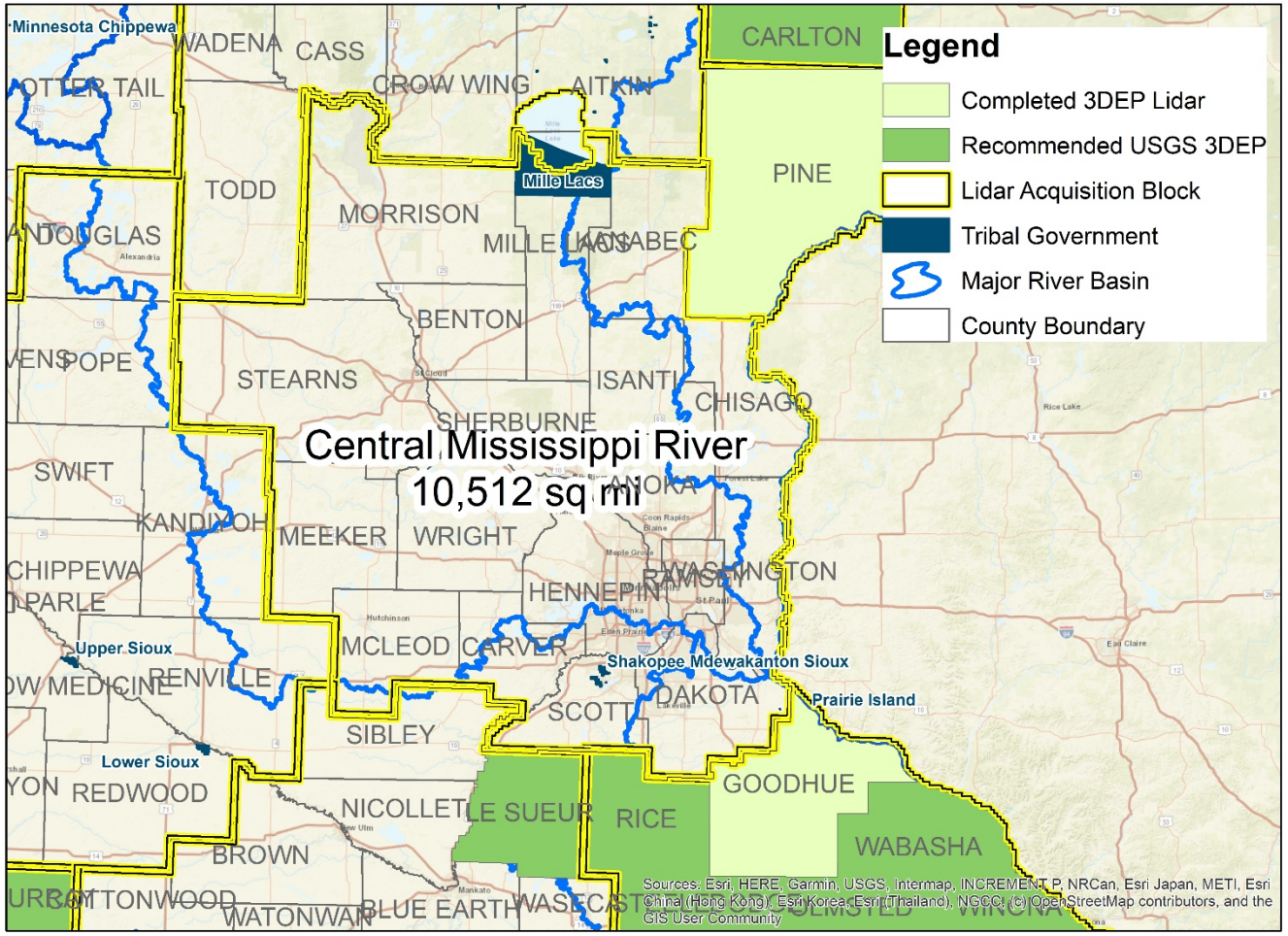


Some anticipated 2021 collections are underway and some will be collected in spring in 2022. TBD areas need partners.

0 25 50 100 Mi

Map Date: May 24, 2021

3DGeo Outreach: *Central Mississippi River (Metro) Block*



Tribal boundaries data source: MnDOT, as per US Census Data September 2019

0 10 20 40 Miles

Map Date: April 27, 2021

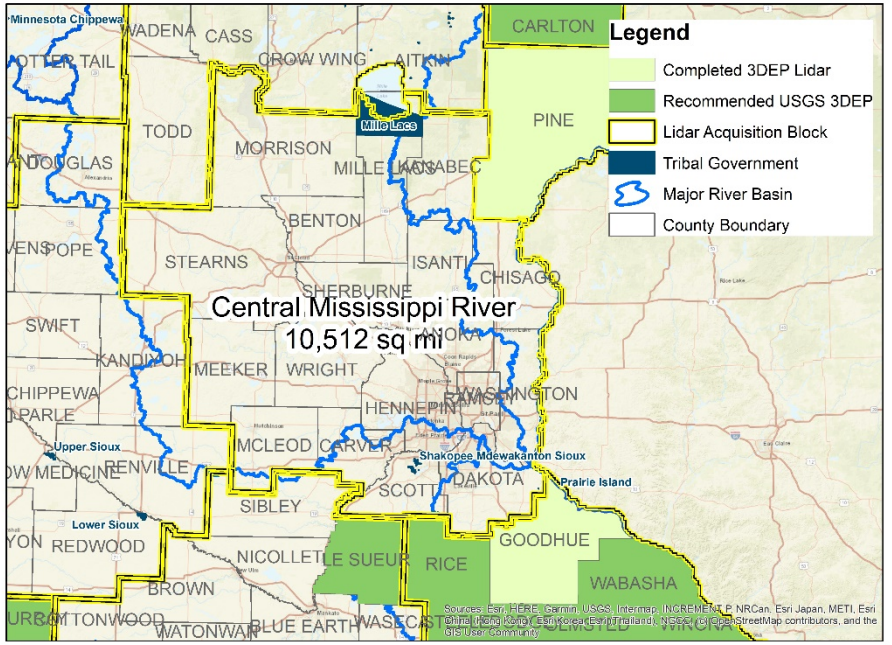
Estimated USGS 3DEP Contribution		Total Partner Contributions Needed	
%	$	%	$
40%	$1,387,584	60%	$2,081,376

10,512 square miles at **$330** per square mile = **$3,468,960** TOTAL

3DGeo Outreach: Partners and Funds Needed: Central Mississippi River Lidar Acquisition Block

- TOTAL Est Funds Needed for QL1: **$3,468,960**
  - **Total** estimated cost assumes **$330** per square mile for **QL1**
  - **Upgrade to QL0 e**stimated cost is **$440** per square mile
  - Partner is responsible for the full upgrade cost between QL1 to QL0
- 18 Counties* - 10,512 square miles
  - **Estimates below** are average and equal cost for each county in the LAB

Contributors	Goal Request %	*Average Per County*	Goal Partnership Amount ($)
USGS	**40**		**1,387,584**
Partners	**60**		**2,081,376**
LAB Counties	*~ 30***	*$57,816*	*1,040,688*
All Others+	*~ 30***		*1,040,688*
QL1 Total	**100**		**3,468,960**



Tribal boundaries data source: MnDOT, as per US Census Data September 2019

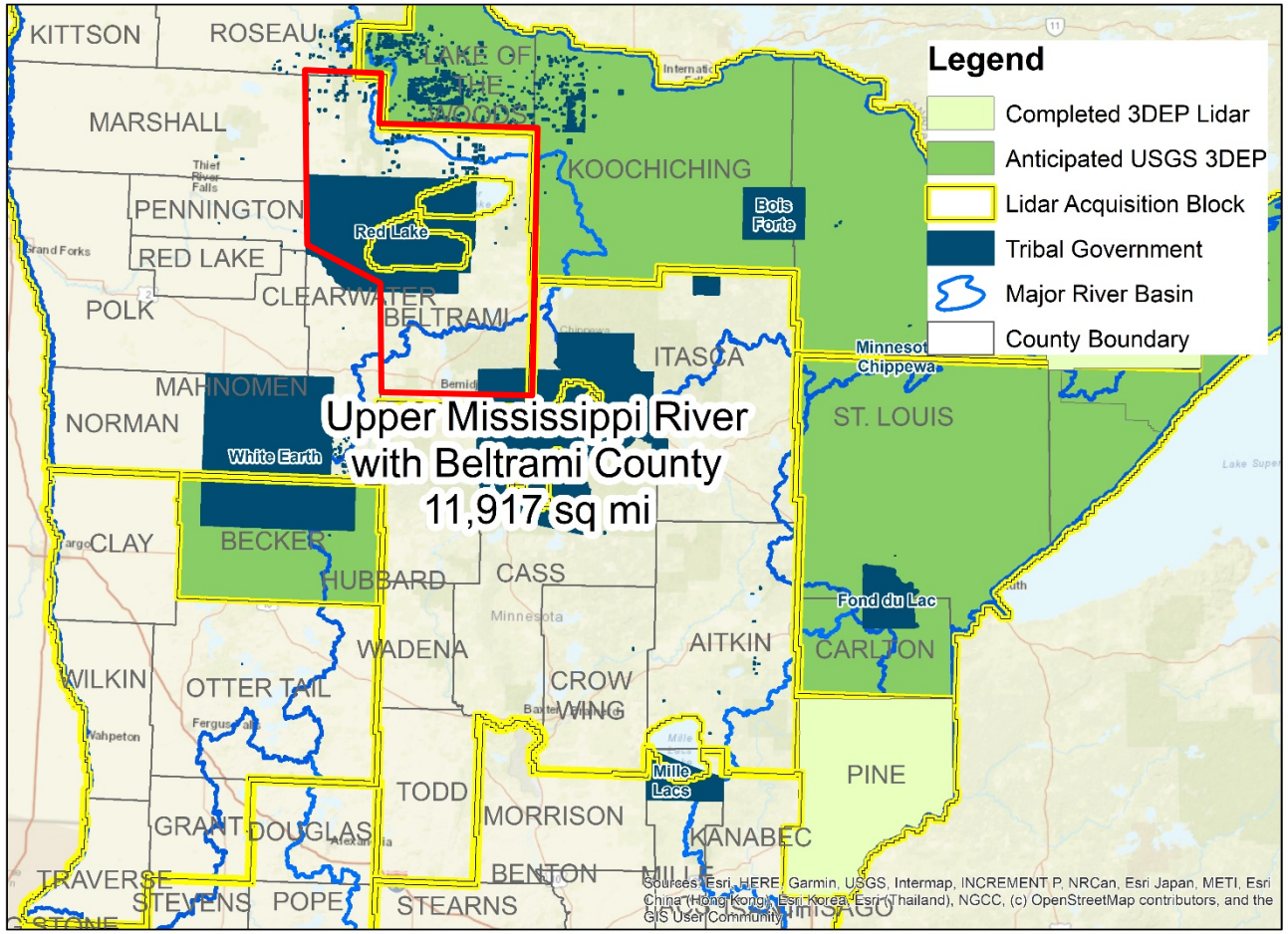
Map Date: April 27, 2021

*Anoka, Benton, Carver, Chisago, Dakota, Hennepin, Isanti, Kanabec, McLoed, Meeker, Mille Lacs, Morrison, Ramsey, Scott, Sherburne, Stearns, Washington, Wright

**This is an estimate, up to 30% of the TOTAL, and dependent on the Lidar Acquisition Block

+ May include Federal and State agencies, Offices, local governments, non-profits, and watershed management boards

3DGeo Outreach: *Upper Mississippi River (Central Lakes) Block*



Tribal boundaries data source: MnDOT, as per US Census Data September 2019

0 12.5 25 50 Mi

Map Date: Aug 20, 2021

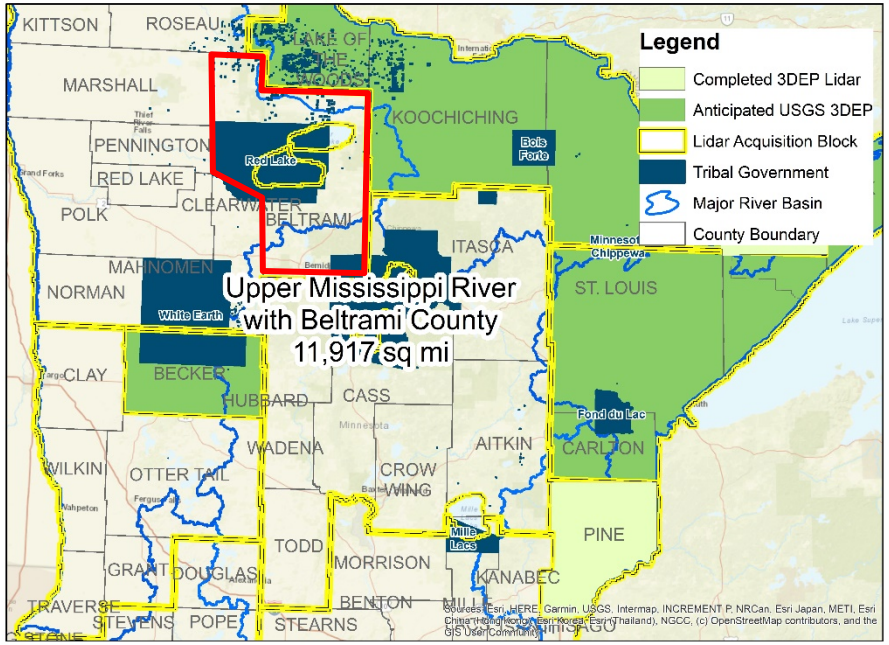
Estimated USGS 3DEP Contribution		Total Partner Contributions Needed	
%	$	%	$
40%	$1,573,044	60%	$2,359,566

11,917 square miles Estimated at **$330** per square mile
= **$3,932,610** TOTAL

3DGeo Outreach: Partners and Funds Needed: Upper Mississippi River Lidar Acquisition Block

- TOTAL Est Funds Needed for QL1: **$3,932,610**
  - **Total** estimated cost assumes **$330** per square mile for **QL1**
  - **Upgrade to QL0 e**stimated cost is **$440** per square mile
  - Partner is responsible for the full upgrade cost between QL1 to QL0
- 8 Counties* - 11,917 square miles
  - **Estimates below** are average and equal cost for each county in the LAB

Contributors	Goal Request %	*Average Per County*	Goal Partnership Amount ($)
USGS	**40**		**1,573,044**
Partners	**60**		**2,359,566**
LAB Counties	*~ 30***	*$147,473*	*1,179,783*
All Others+	*~ 30***		*1,179,783*
QL1 Total	**100**		**3,932,610**



Tribal boundaries data source: MnDOT, as per US Census Data September 2019

Map Date: Aug 20, 2021

* Aitkin, Beltrami, Cass, Crow Wing, Hubbard, Itasca, Todd, Wadena

**This is an estimate, up to 30% of the TOTAL, and dependent on the Lidar Acquisition Block

+ May include Federal and State agencies, Offices, local governments, non-profits, and watershed management boards

Next Steps

Timeline - upcoming steps

Date	Task
August 27	Optional: Partners provide notification to lidar@state.mn.us of any upgrade request(s)
September 3	3DGeo submits IGCE to obtain costs for final lidar acquisition areas, and upgrade areas
September ??	USGS provides cost estimates to 3DGeo in response to IGCE 3DGeo passes shares upgrade costs with partners
September 24	Partners provide completed “Attachment D” to lidar@state.mn.us
October 1	BAA application submitted by MNIT on behalf of 3DGeo partners
Winter	USGS provides approval of grant
January/February	MNIT executes Joint Powers Agreements (JPAs) with each local partner MNIT signs Joint Funding Agreement (JFA) with USGS on behalf of all local partners Statement of work (SOW) is agreed for work
March?	After JFA, SOW complete; USGS contracting moves forward; Vendor and partners work on detailed technical task order for lidar acquisition
March	Partners provides funds towards task order
March/April	Task order issued
April/May	Lidar Acquisition

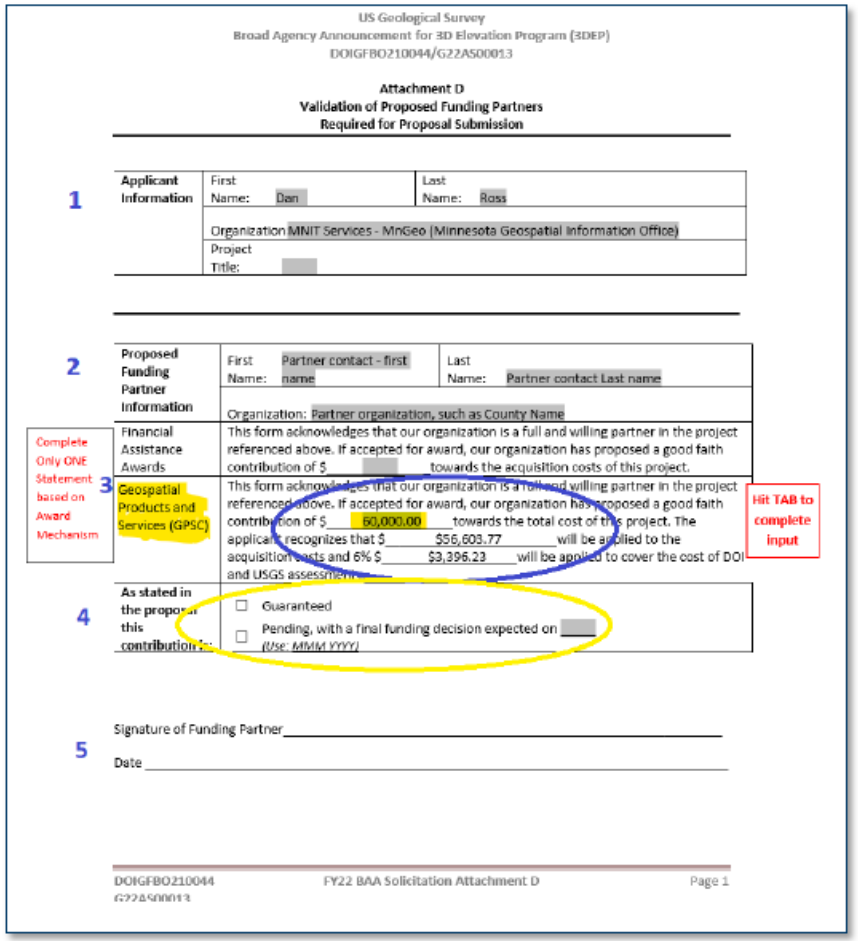
https://www.mngeo.state.mn.us/committee/3dgeo/acquisition/status.html

Attachment D: is the way we communicate funding with USGS

Attachment D FY22 Form Completion Tips

Thanks so much for working with the MN GAC 3D Geo Committee on a USGS 3DEP BAA grant request. Here are some tips on filling out the Attachment D form. Please contact us at lidar@state.mn.us if you need more assistance or have questions.

1. Applicant Information:
   MNIT – MnGeo will be submitting the application to USGS on behalf of the Geospatial Advisory Council's 3D Geo Committee.
   a. First Name: **Dan** Last Name: **Ross**
   b. Organization: **MNIT Services - MnGeo (Minnesota Geospatial Information Office)**
   c. Fill out the project title, if known.
2. Proposed funding partner:
   a. Fill out the first and last names of the contact at your organization
   b. Fill out the name of your organization, such as the County name, or State Agency name and division
3. Statement section:
   a. Fill out only the **GPSC section** (highlighted in yellow below).
   b. Enter your organization funding amount in the first input box (highlighted in yellow).
   c. Note that the next two lines will be automatically calculated when you hit the **TAB key**. These are showing that a percentage of the contribution will be put to the project management by USGS and DOI.
4. Contribution Type section:
   a. Select either guaranteed or pending box.
   Pending could be selected by a county if they have set aside funds, but they need to be approved by the Board. The Board meeting data can be put in the date field
   b. If the pending box is selected, enter the date in the format shown.
5. Signature section:
   a. The funding partner in section 2 signs and dates the form.
6. Email your completed form to lidar@state.mn.us



US Geological Survey
Broad Agency Announcement for 3D Elevation Program (3DEP)
DOIGFBO210044/G22AS00013

Attachment D
Validation of Proposed Funding Partners
Required for Proposal Submission

1

Applicant Information	First Name: Dan	Last Name: Ross
	Organization: MNIT Services - MnGeo (Minnesota Geospatial Information Office)	
	Project Title:	

2

Proposed Funding Partner Information	First Name: Partner contact - first name	Last Name: Partner contact Last name
	Organization: Partner organization, such as County Name	

Complete Only ONE Statement based on Award Mechanism

Financial Assistance Awards	This form acknowledges that our organization is a full and willing partner in the project referenced above. If accepted for award, our organization has proposed a good faith contribution of $ _____ towards the acquisition costs of this project.
3 Geospatial Products and Services (GPSC)	This form acknowledges that our organization is a full and willing partner in the project referenced above. If accepted for award, our organization has proposed a good faith contribution of $ 60,000.00 towards the total cost of this project. The applicant recognizes that $ $56,603.77 will be applied to the acquisition costs and 6% $ $3,396.23 will be applied to cover the cost of DOI and USGS assessment.

Hit TAB to complete input

4

As stated in the proposal this contribution is:

☐ Guaranteed
☐ Pending, with a final funding decision expected on _____ *(Use: MMM YYYY)*

5

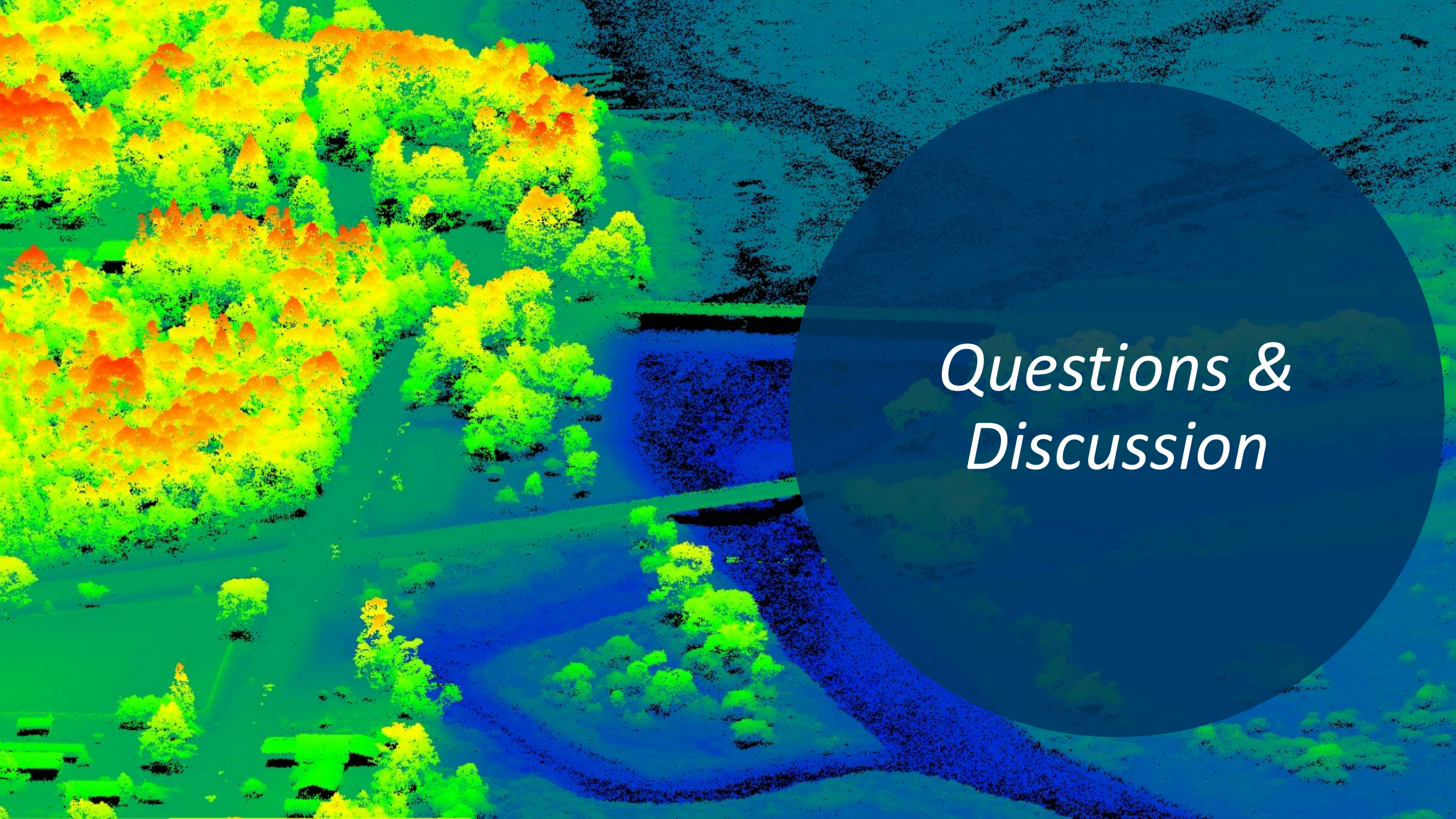
Signature of Funding Partner _____

Date _____

DOIGFBO210044 FY22 BAA Solicitation Attachment D Page 1
G22AS00013

FAQs - Administration of Funding and Contracting

- Under 3DEP Geospatial Product and Service Contracts (GPSC), the USGS will negotiate and manage the vendor contract
- Partners are encouraged to participate in an independent check of the data, but the USGS and the Vendor handle all official QA/QC
- MNIT MnGeo will manage the joint powers agreements with partners
- Funding agreements need to be in place 90 days prior to acquisition
- Review our Status Page, previous slide, and email us with questions, regarding the timing of invoicing and payments


Questions &
Discussion

FAQs - Deliverables

- What other deliverables can be purchased and how will those addendums be handled in the contract?
- How will the data be delivered? Point cloud? Contours? DEM?
- What coordinate system will lidar data be delivered?

FAQs - Costs

- What is the cost per county for each LAB?
- Will data be acquired for counties in the LAB that have opted out of contributing?
- How will funds be collected for those areas?

FAQs - Quality Level

- Explain the specification differences between QL1 and QL0.
- What are the advantages of buying up to QL0?
- What is the cost structure for buying up to QL0? Can a city decide to purchase QL0 data or must it be a countywide decision?