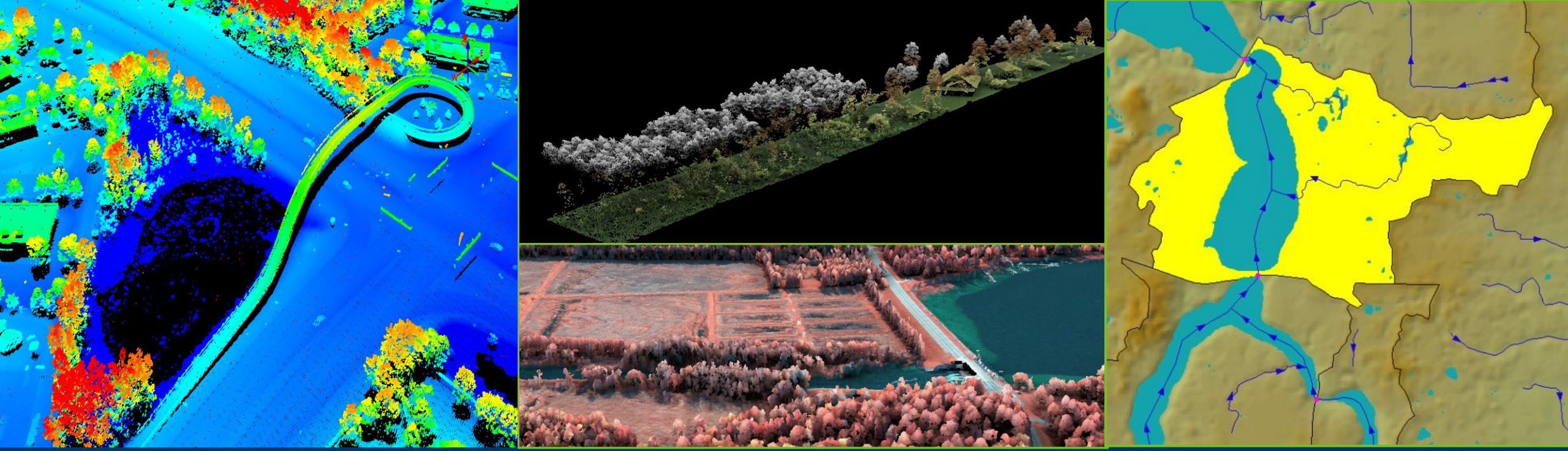


3D Geomatics Acquisition Workgroup: Minnesota Lidar Plan

Co-Chairs: Sean Vaughn, DNR-MNIT and Gerry Sjerven, MN Power

January 11, 2021

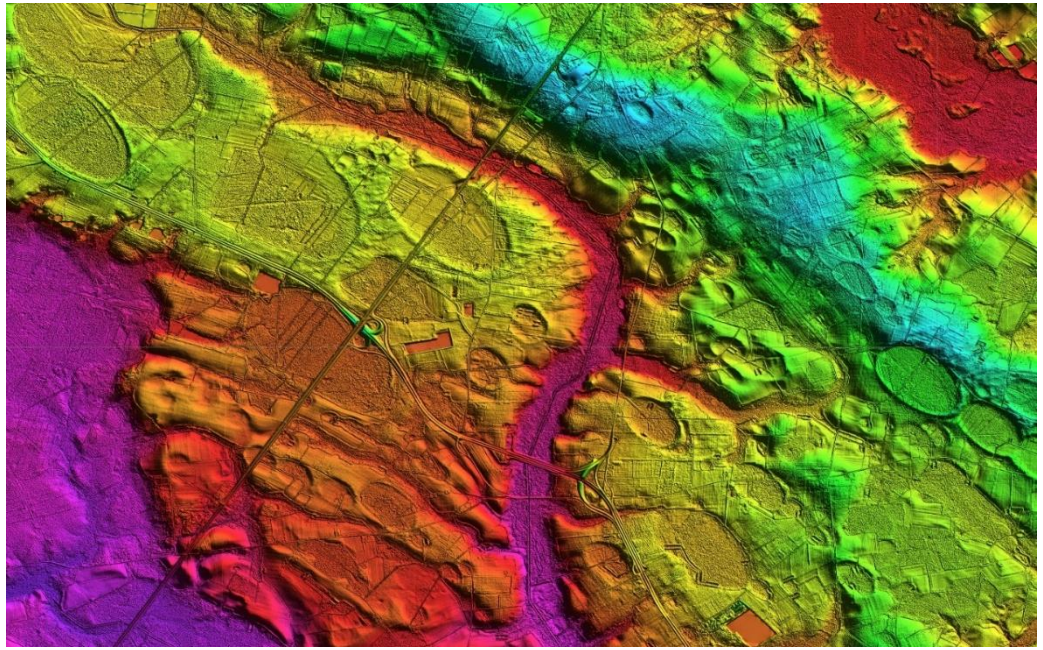
Hosted by the MetroGIS Coordinating Committee

MINNESOTA GEOSPATIAL ADVISORY COUNCIL

Welcome!

Thank you for inviting us to your meeting.

- 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 lidar collects for Minnesota.
- We welcome your input today and going forward.

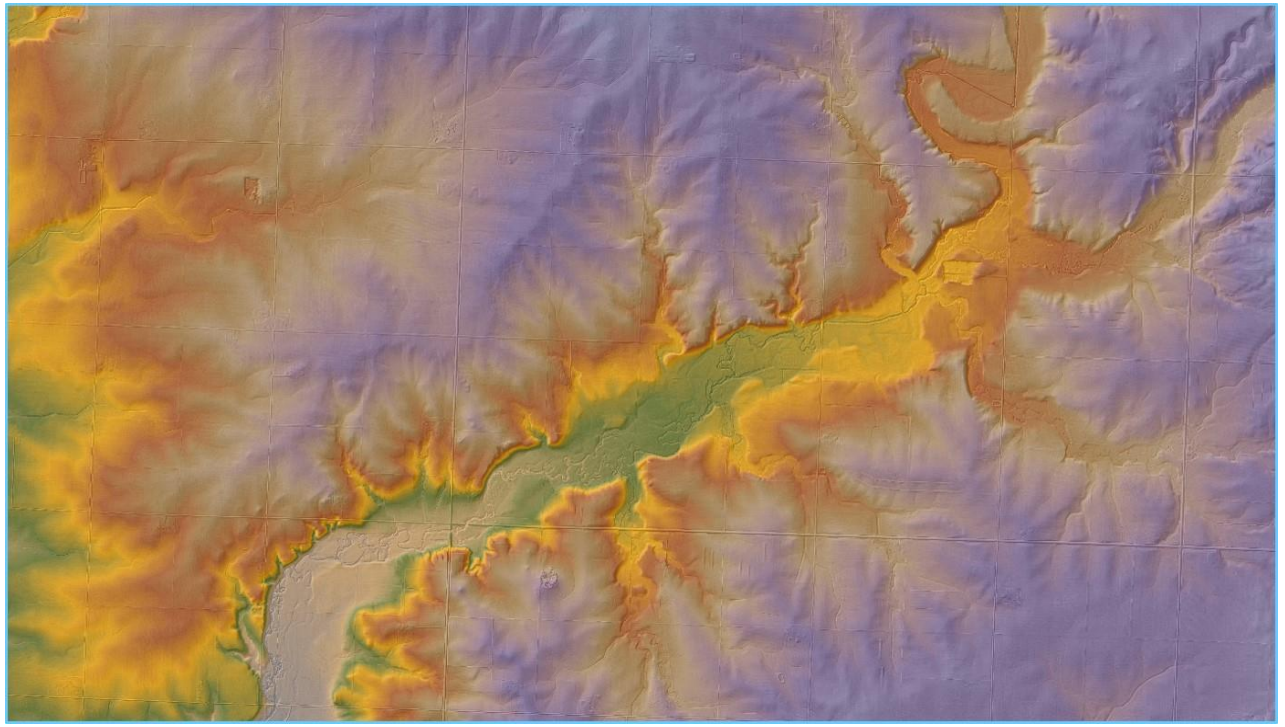


Meeting Housekeeping

- Please **mute** your microphone if you're not speaking
- Type in questions anytime into the **chat window**, and we'll address them during the Q&A section
  - Feel free to use your microphone during Q&A session
- Slides will be shared after the meeting

Goals for today

- Who is 3D Geomatics (3DGeo)?
- What is this partnership and plan all about?
- What is Lidar in 2020 and beyond?
- What do we get for the money we can contribute?
- When do we get our deliverables?
- What's the next steps after this meeting?



Coordinating Minnesota's Lidar Acquisition

Geospatial Advisory Council (GAC) - 3D Geomatics Committee

Geospatial Advisory Council (GAC)

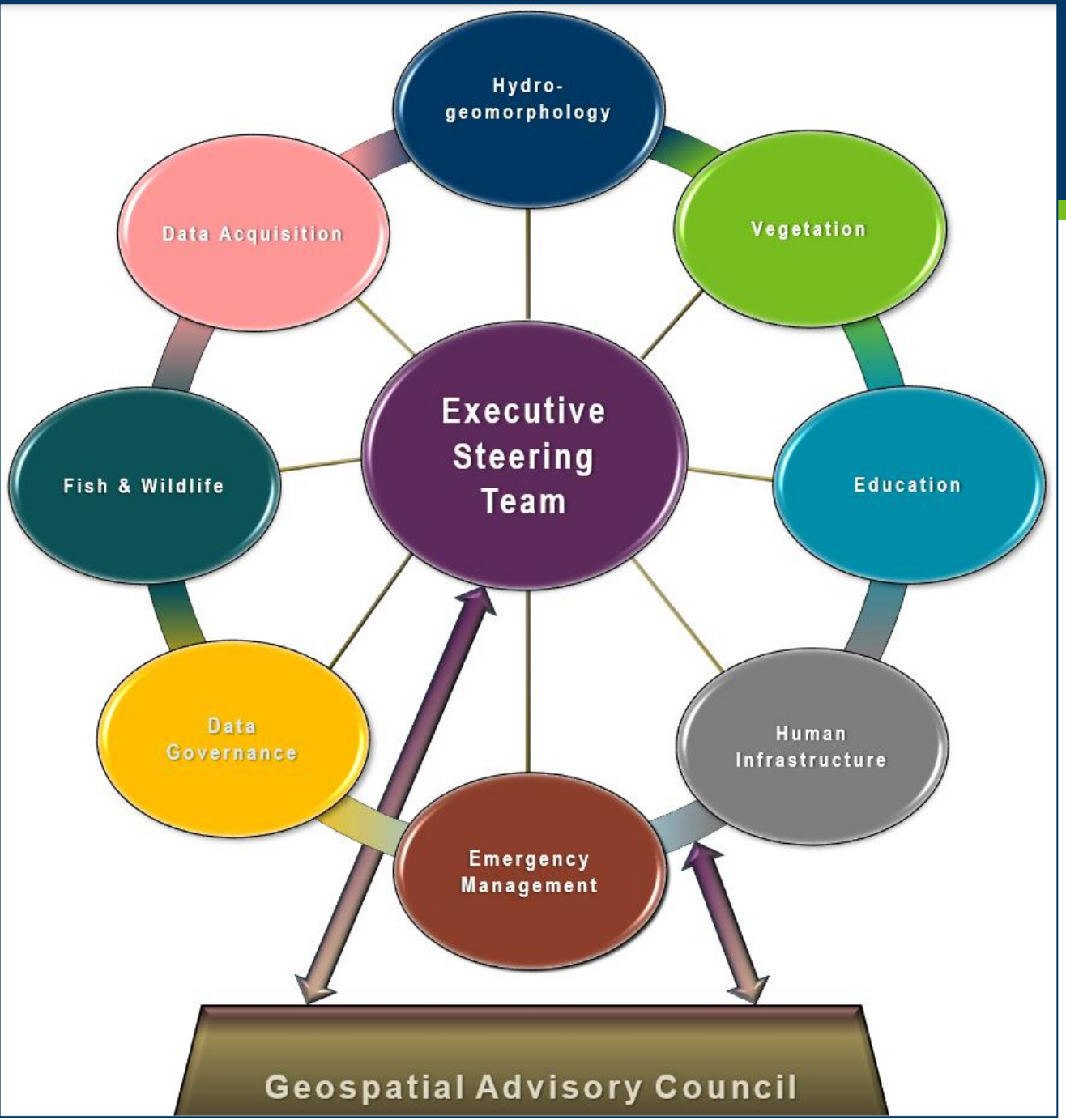
- **Coordinating body** for the Minnesota geospatial community.
- **Cross-section of organizations** that include counties, cities, universities, business, nonprofit organizations, federal and state agencies, tribal government, and other stakeholder groups.

3D Geomatics Committee (3DGeo)

- Committee **under the GAC**
- Works to identify and promote the need for planning, funding, acquisition, and management of three-dimensional geomatic data and derived products.
- Lidar acquisition led by a team with **dedicated time** working to bring new high-definition lidar to Minnesota.

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

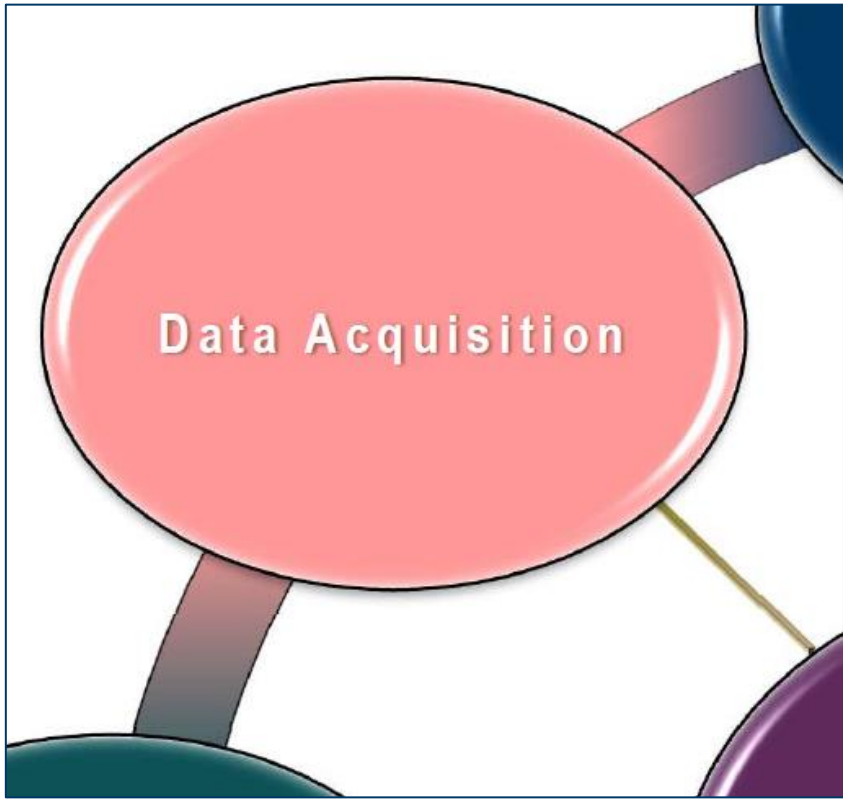
3DGeo Executive Steering Team

- 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.



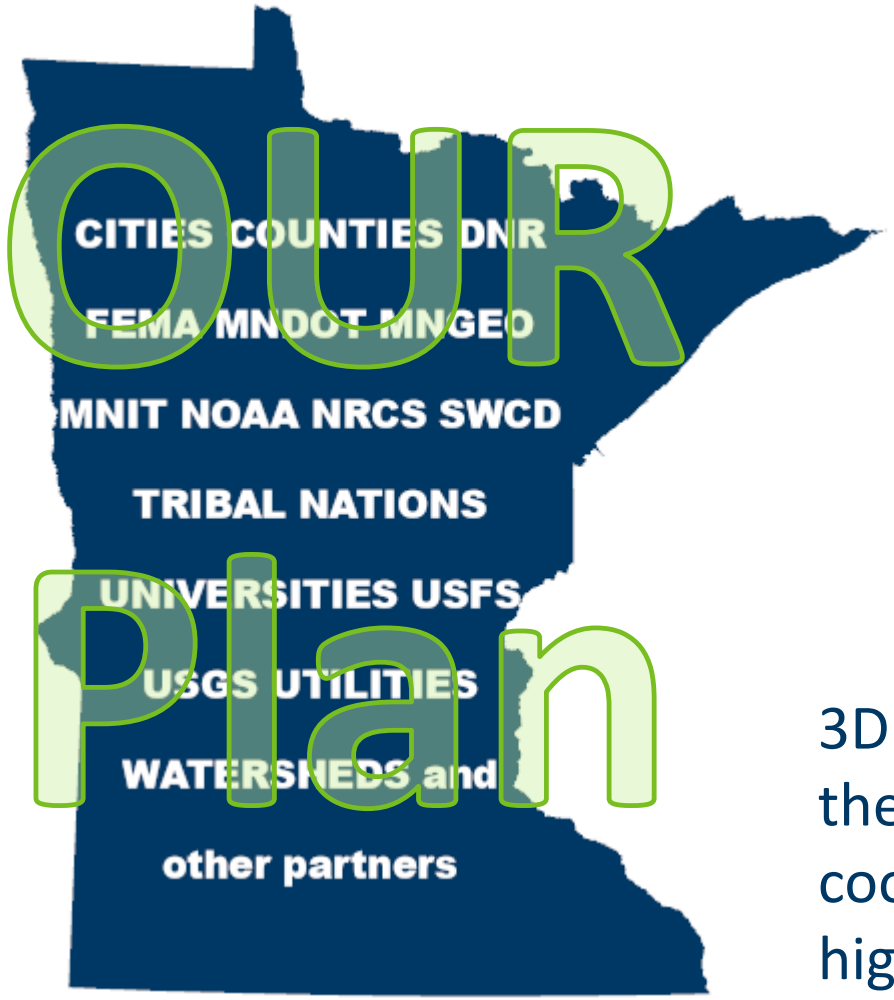
Co-Chairs

- Sean Vaughn, Alison Slaats, and Gerry Sjerven

Lidar Acquisition Subgroup:

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

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

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 national need for a nationwide elevation layer
- 3DGeo is working to organize lidar acquisition so that Minnesota can take advantage of this **USGS federal funding opportunity**
- **Economies of scale** are achieved
  - The bigger the collection footprint, the lower the cost

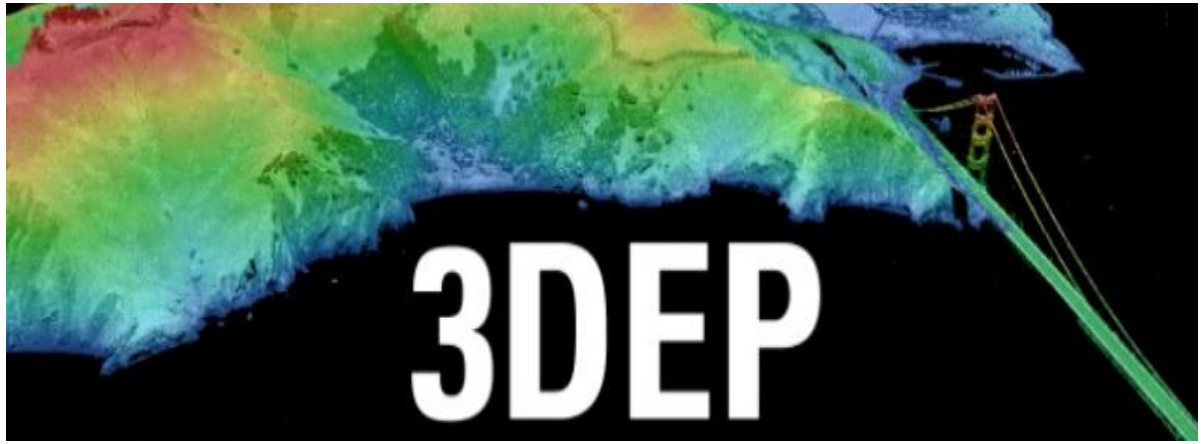

Bayview
Oneota
Proctor
West Duluth
DULUTH
ST LOUIS BAY
NORTH CHANNEL
SOUTH CHANNEL
Kingsbury
Knowlton
Riverside
Tallas Island
CHANNEL
Clough
Island
SUPERIOR
Billings Park
St Patricks Sch
Smithville
MINNESOTA
ST LOUIS CO
DOUGLAS CO

What:
3DEP

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
- Goal: elevation dataset for the nation **by 2023**

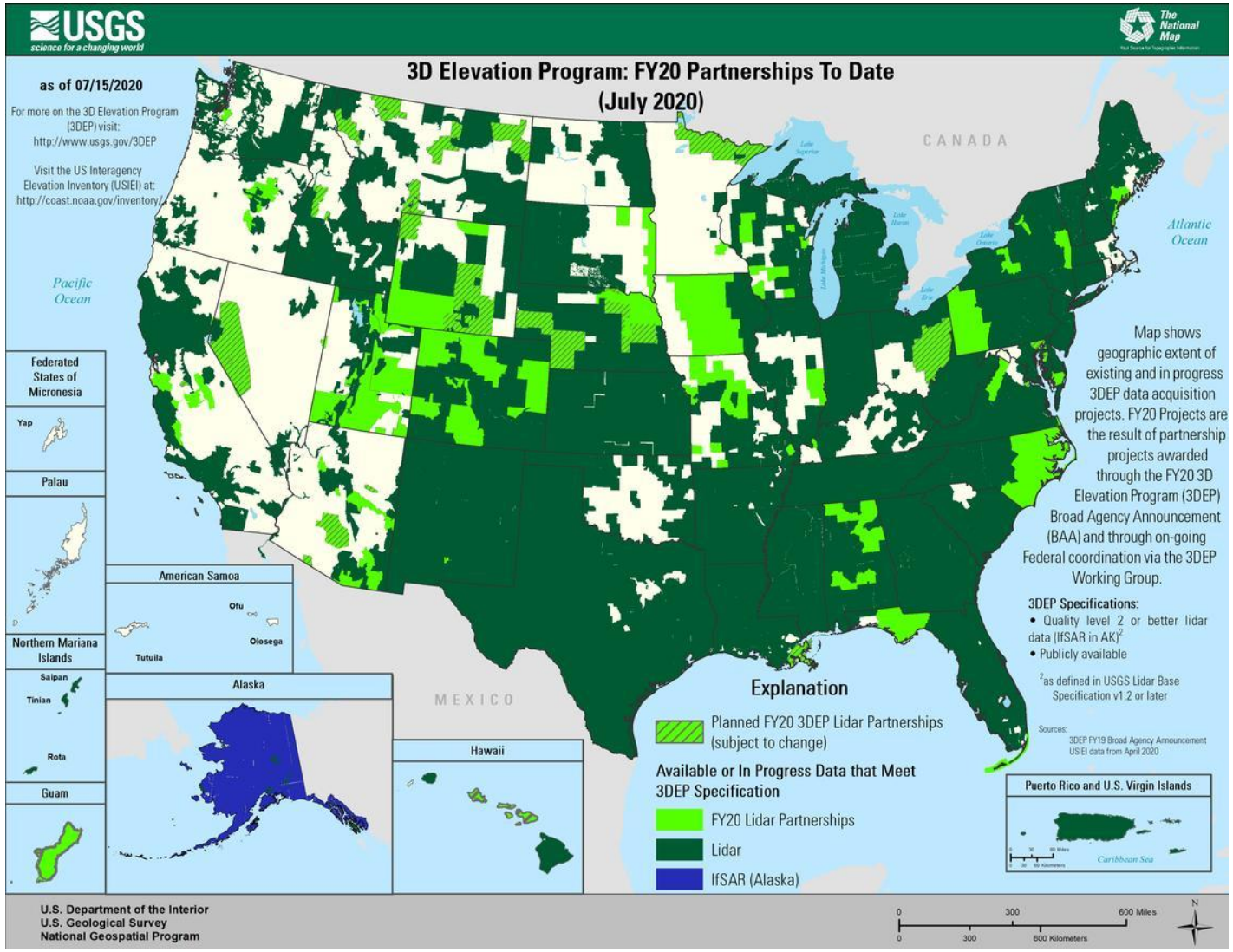


- Acquisition contracts are under two managerial mechanisms
  - GPSC
  - COOP

USGS 3D Elevation Program (3DEP)

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 is **cost-sharing** via grant funds for QL2 or greater
- Grants through “BAA” process – **deadlines** are every fall (Oct/Nov)



What is lidar?

- **Lidar** stands for **li**ght **d**etection **a**nd **r**anging
- It is a **mapping technology** that uses a pulsed laser to measure the time it takes for emitted light to travel from a sensor to the ground or other objects and back.
- The sensor can **pulse** a laser beam hundreds of thousands of times per second, millions of returns ("**points**") are captured, resulting in a "point cloud" of three-dimensional measurements.

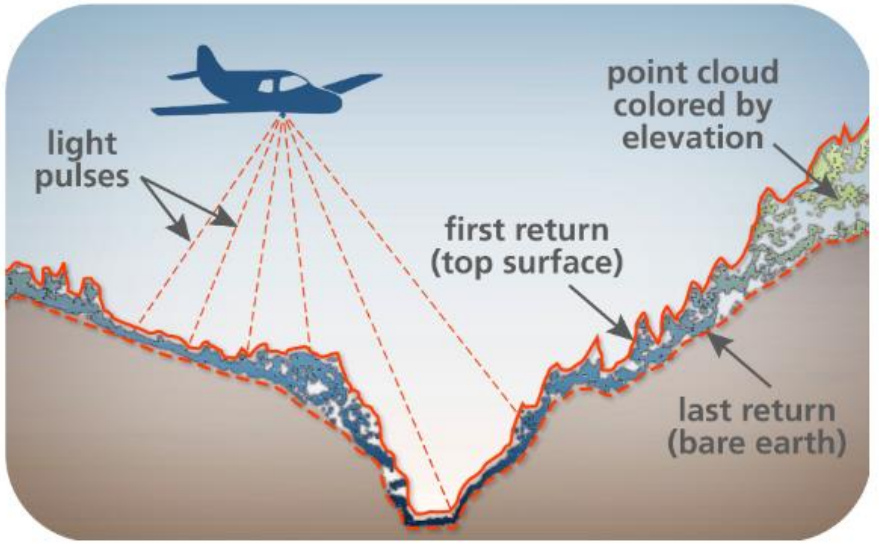
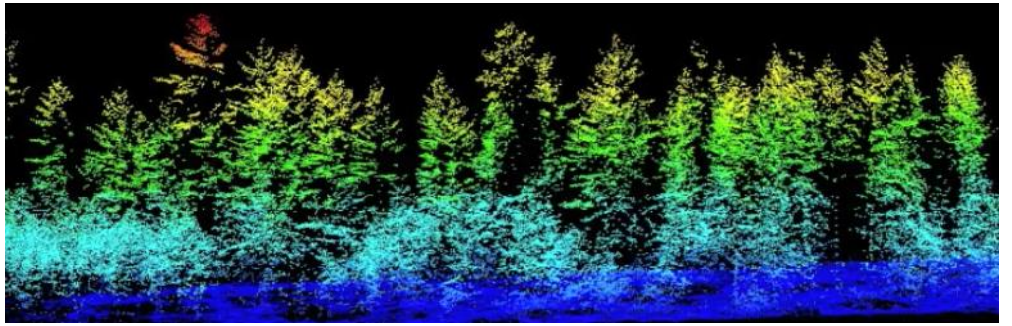


Image from the Washington Geological Survey



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 data as part of a data procurement project within a 3D Geomatics lidar acquisition area.

What is: High-density Lidar

Need for High-density Lidar

- Higher-resolution, higher-quality, and higher density lidar dramatically **improves** our ability to analyze the landscape in Minnesota, map assets, and assess resources
- Provides the foundation for development of authoritative **derived products** use to analyze and plan for current and future scenarios, and make better informed decisions
- Enables practitioners, managers, and researchers to be more **proactive** than reactive.

Lidar Point Cloud Colorized by Photo

What is High Density Lidar?

High-Density lidar is defined by **two measures:**

1. Pulse Spacing
2. Pulse Density

LiDAR BASE SPECIFICATION (LBS)	**LBS Table 1** Minimum Net Pulse Density and Spacing for a Single lidar Collection Mission	
Quality Level (QL)	**Aggregate Nominal Pulse Spacing (ANPS)** [m]	**Aggregate Nominal Pulse Density (ANPD)** [pulse/m^2]
QL-0	≤ 0.35	≥ 8.0
QL-1	≤ 0.35	≥ 8.0
QL-2	≤ 0.71	≥ 2.0
QL-3	≤ 1.41	≥ 0.5

3DGeo Committee Minimum → QL-1

3DEP Base Specification Minimum → QL-2

Current Minnesota Data Holdings → QL-3

4X

16X

These two HD technical measures relate to flight **mission** and lidar **platforms** affecting:

1. Point Density of the lidar Point Cloud
2. Derived Products

(shown in next slide)

Increased Density = Improved Detail

- **QL1 = 8+ pulses per 1 square meter**
- **QL3 = 1 pulse per 2 square meters**

That's 16+ QL1 pulses per the same 2m area of QL3

HD Lidar – Derived Products

Lidar Quality Levels Define Deliverable Specifications

- Minimum **DEM** Cell Size
- Minimum **Contour** Interval

LiDAR BASE SPECIFICATION (LBS)	LBS Table 6 Minimum DEM Cell Size		
Quality Level (QL)	**Minimum Cell Size** [m]	**Minimum Cell Size** [ft]	**Supported Contour Interval Accuracy** [ft]
QL-0	0.5	1.0	0.5
QL-1	0.5	1.0	1.0
QL-2	1.0	2.0	1.0
QL-3	2.0	5.0	2.0

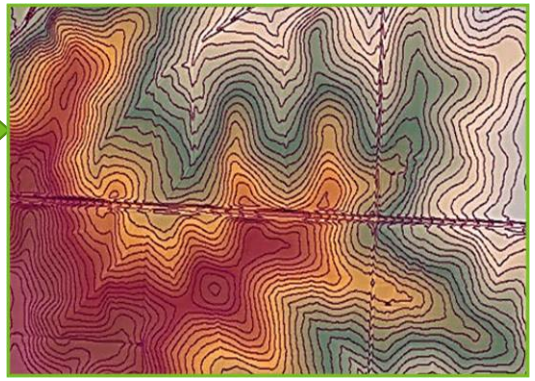
3DGeo Committee Minimum →

3DEP Base Specification Minimum →

Current Minnesota Data Holdings →

16X

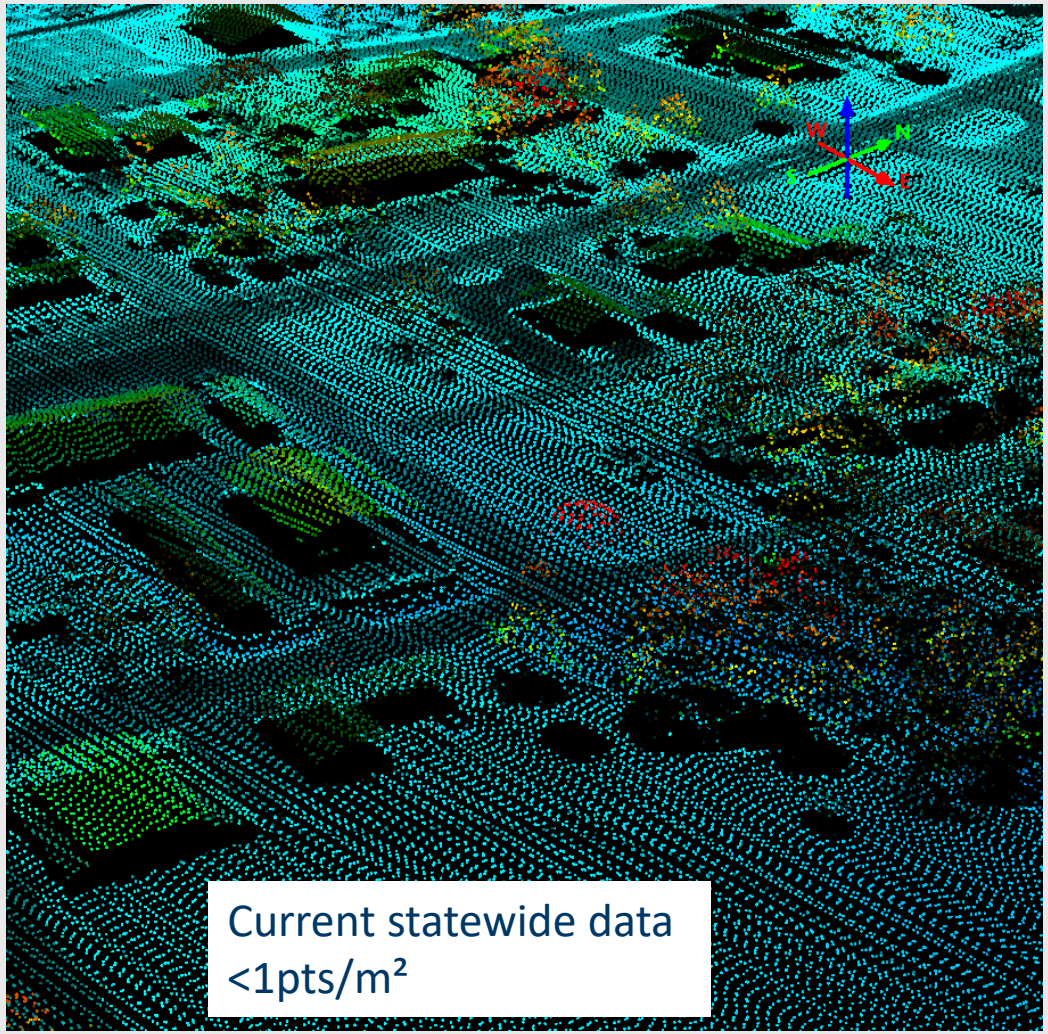
2X

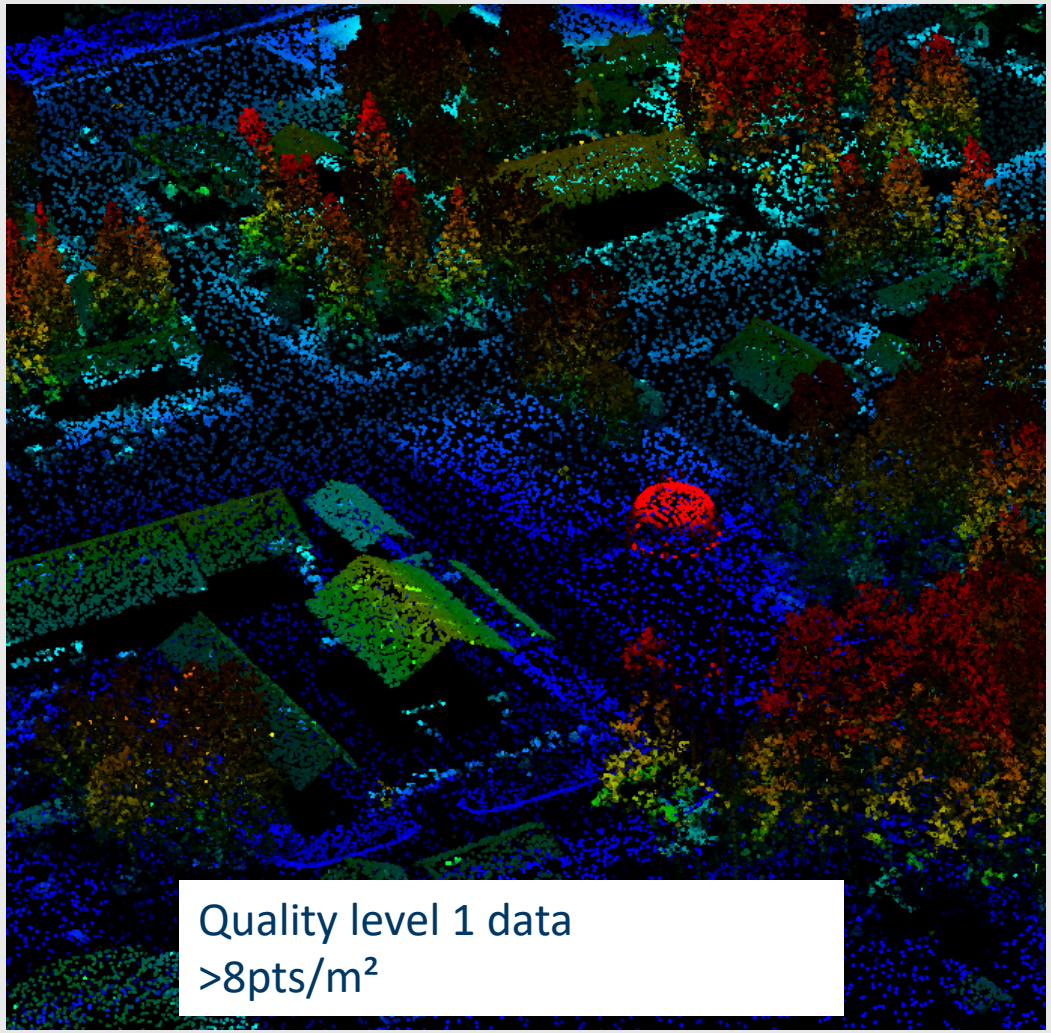


A High-density Pulse = High Density of Points = Highly Detailed Derived Products

QL1 = 16 grid cells per one QL3 cell
QL1 = 2 additional contour lines for every one 2-foot contour

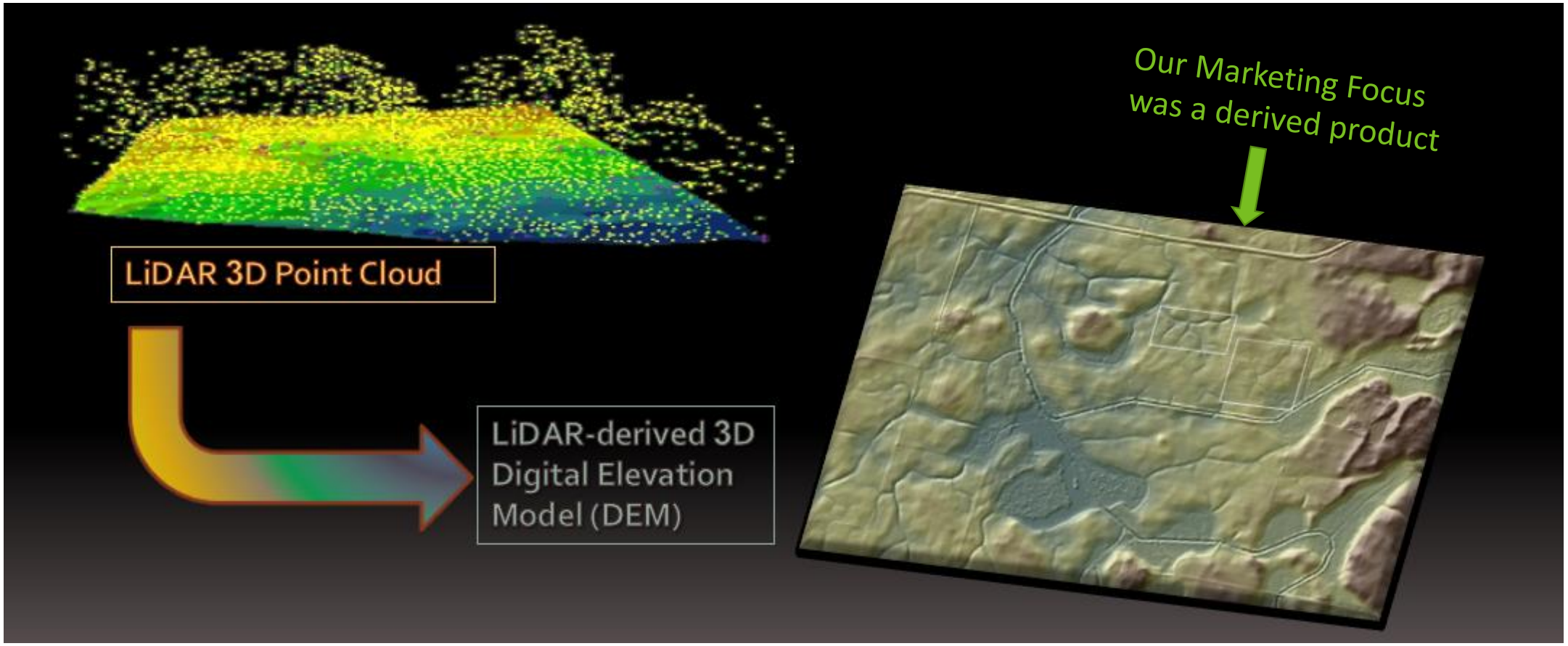
“…but you already have Lidar”
Quality Matters





HD Lidar – Derived Products

DIGITAL ELEVATION – The Catalyst for Minnesota's Initial Lidar



HD Lidar – Derived Products - Hydrology Example

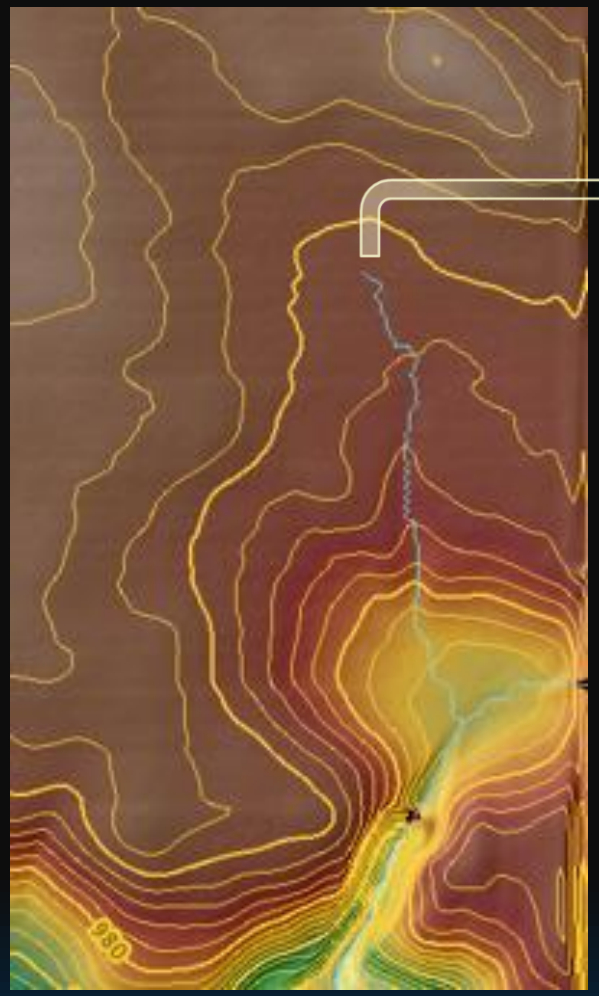
WATER CONVEYANCE LANDFORMS

Mapping the Unmapped

- 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 – Derived Products LiDAR → Point Cloud → DEM

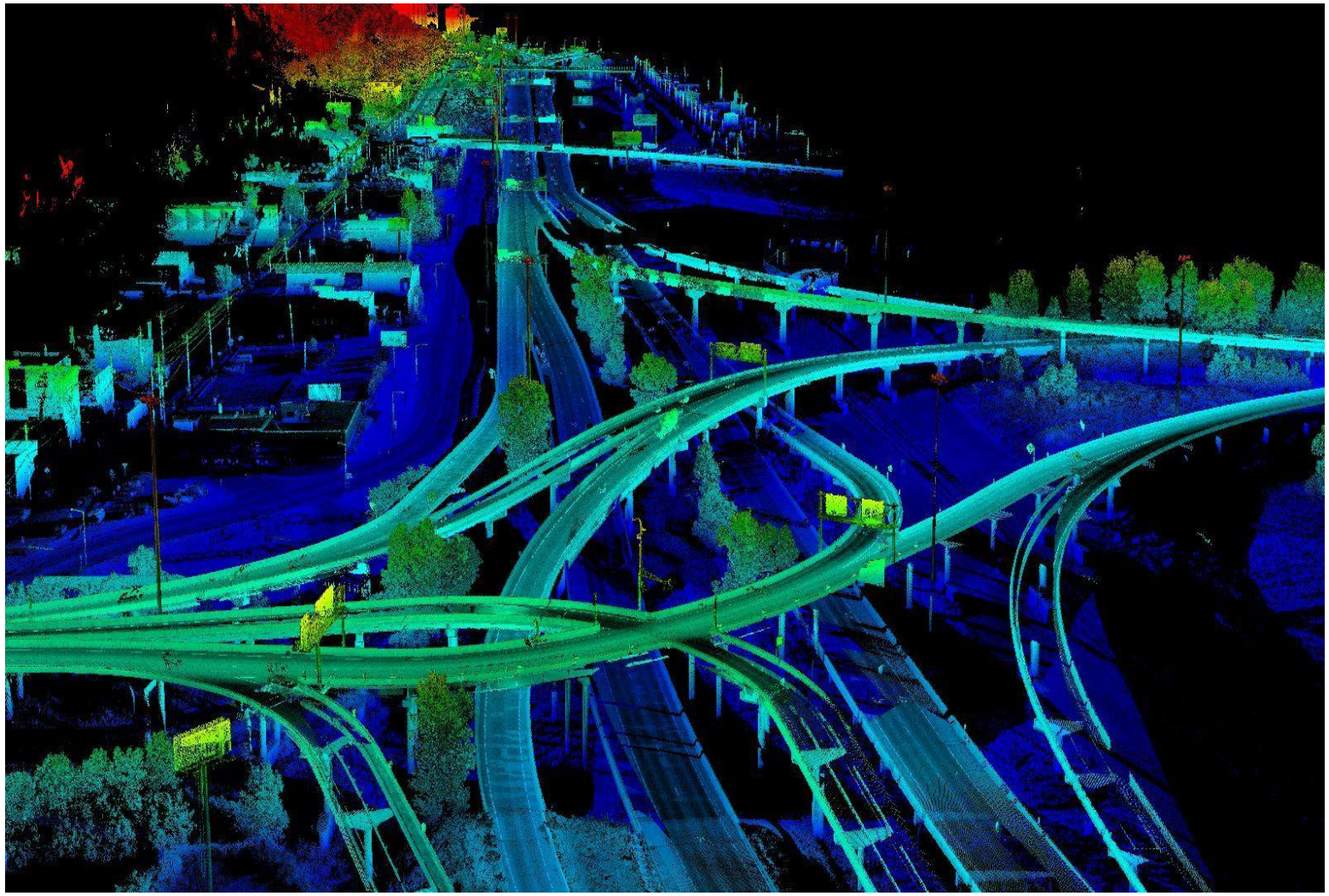


- Features of hydrologic Significance.
  - Nickpoint
  - Water Conveyance Landform
- Where does the watercourse begin ?
  - Where concentrated flow begins. LiDAR captures these landforms.

We Do this with Digital Elevation Models (DEM)

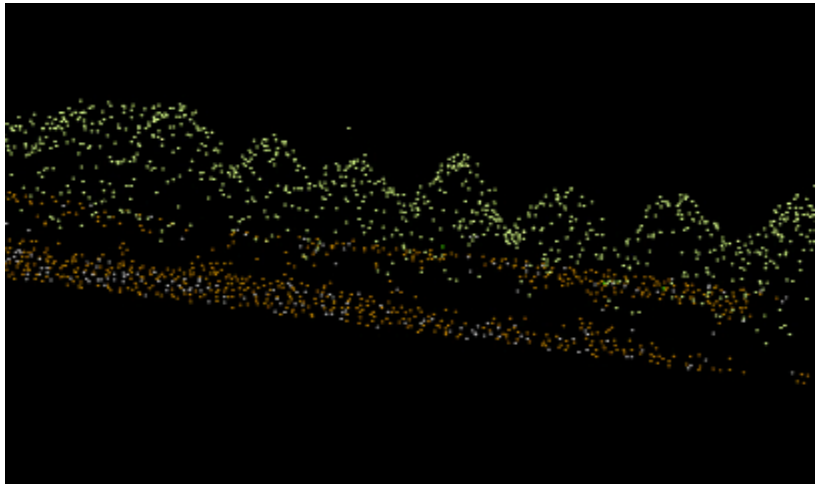
HD Lidar Examples: **Infrastructure**

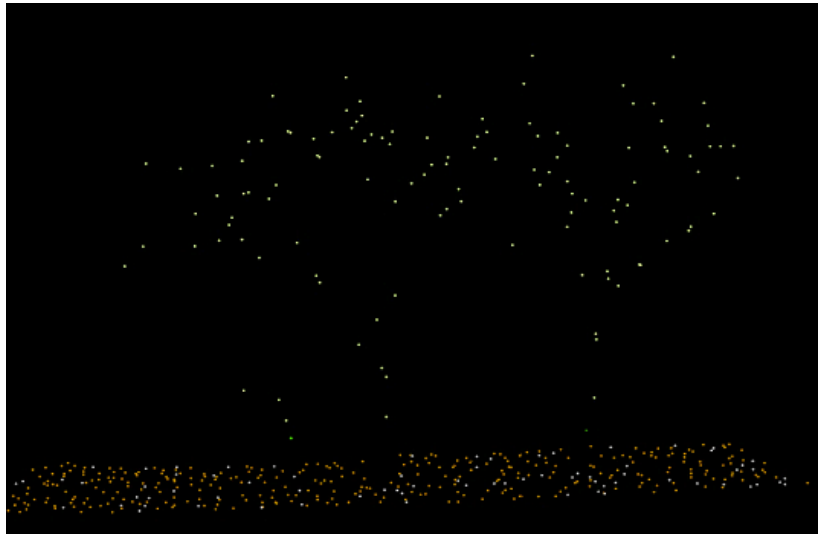
- Transportation
  - 3d Design
  - Traffic operations
  - Signing and striping
  - Highway safety
  - Maintenance
  - Asset management
- Energy
  - Traditional
  - Renewable/Alternative
- Cultural/Historical Resources



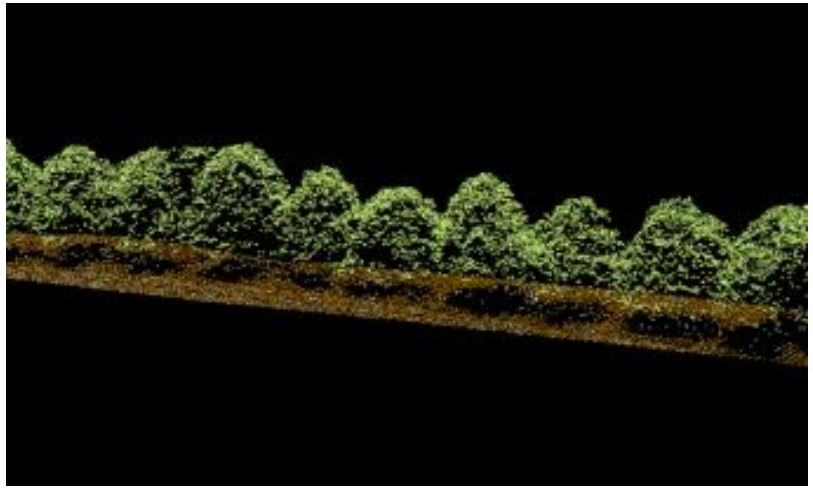
HD Lidar Examples: **Vegetation Mapping**

Low Density (QL3, 1ppm)



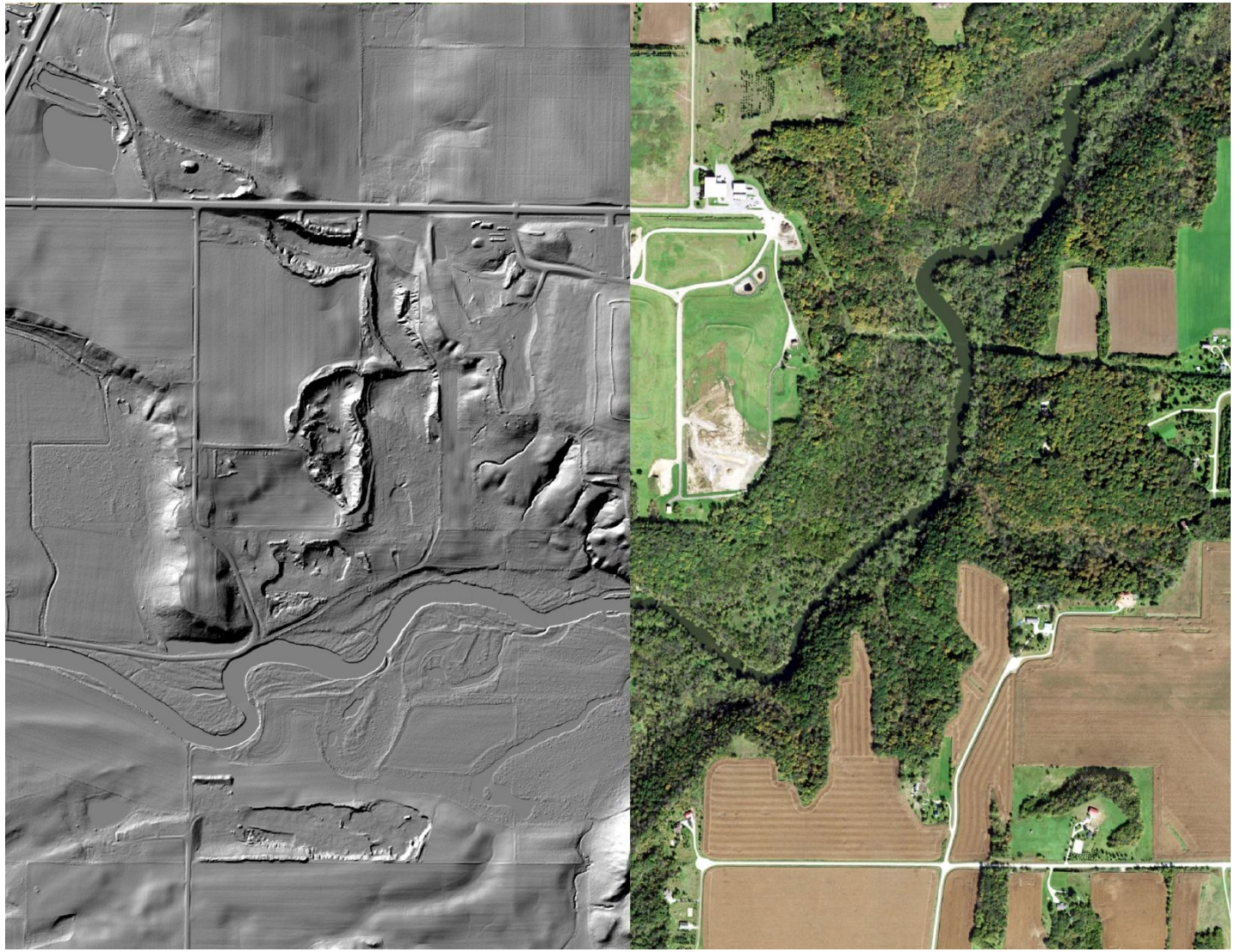


High Density (QL1, 8+ppm)



HD Lidar Examples: **Soil and Water**

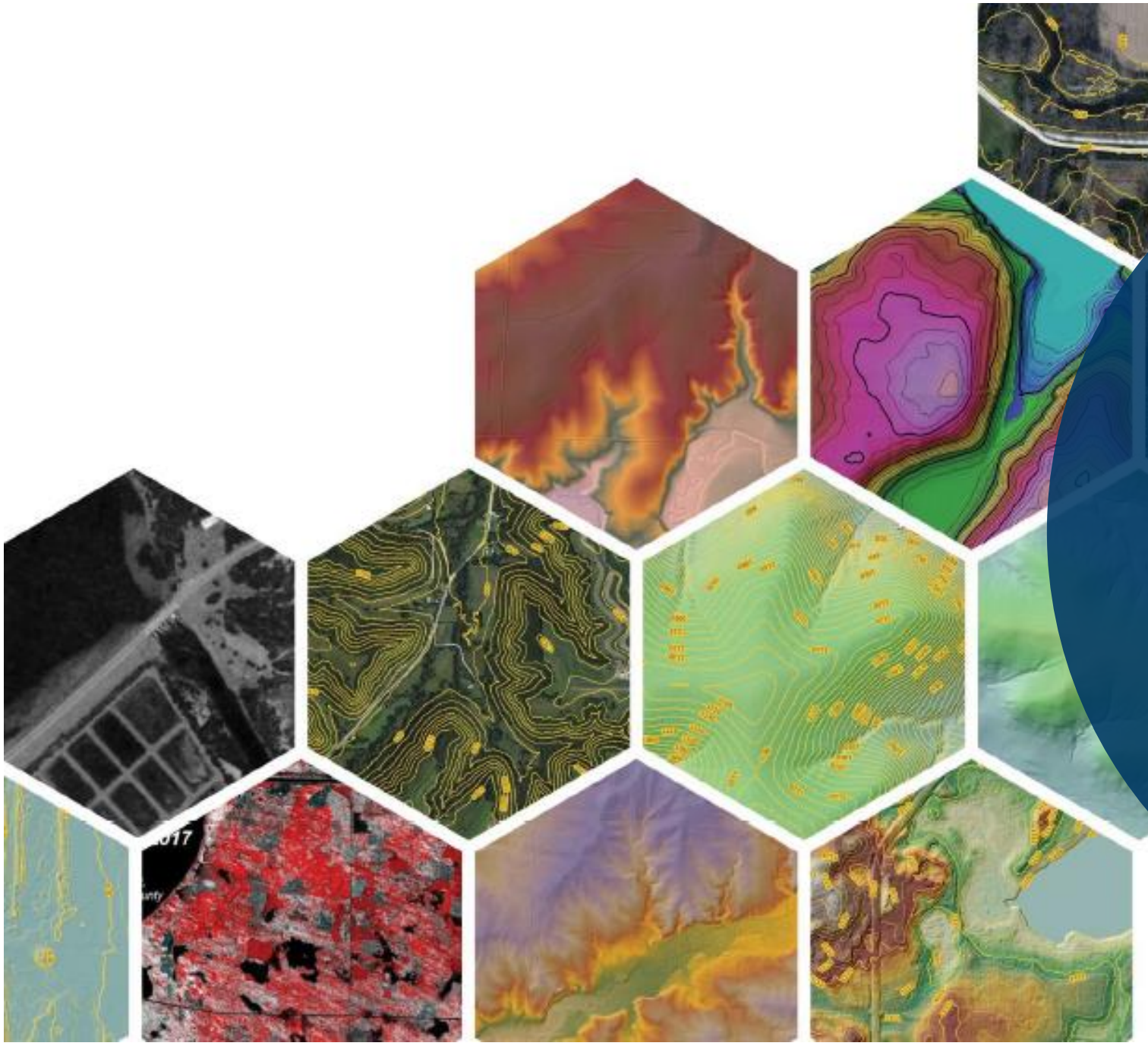
- Model **movement of water** on the landscape
- Key **building block** of modeling processes
- Identification of best management practices (**BMP**)
- Wetland and vegetation management



HD Lidar Examples: **Floodplain Mapping**

2020 - Progressive Approach

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

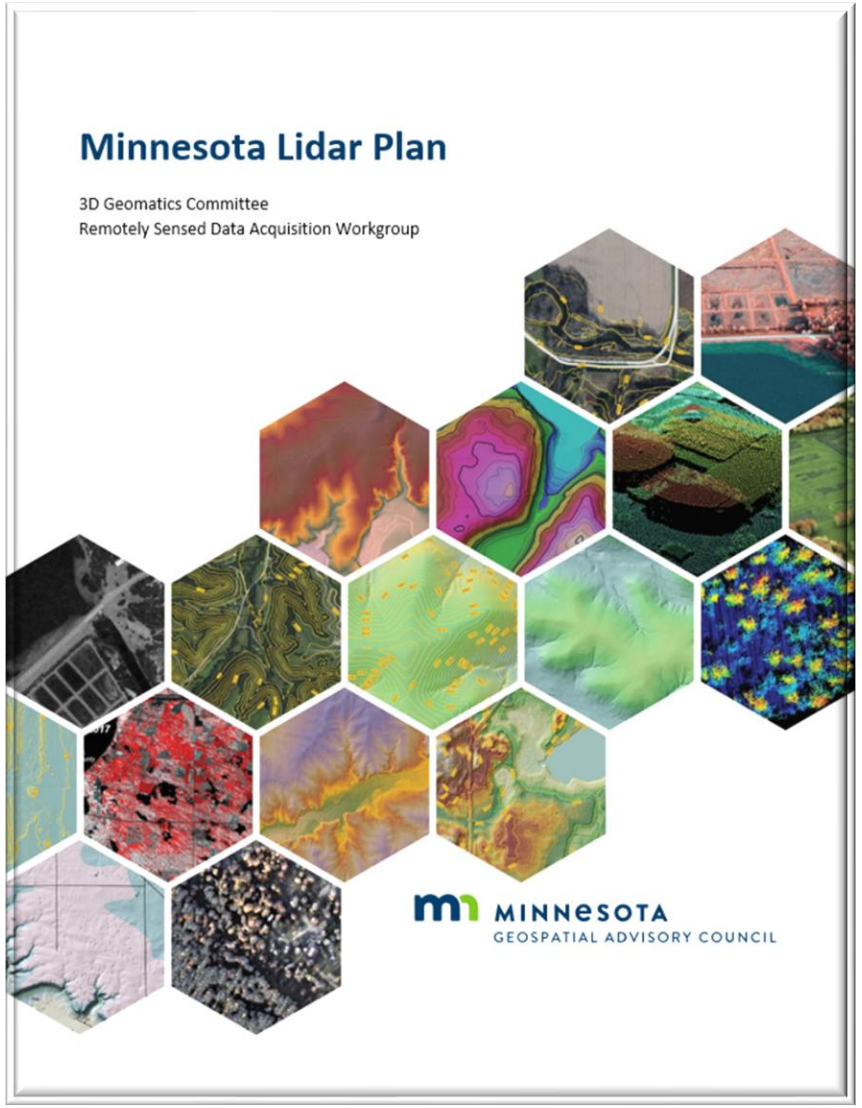


What: Minnesota Lidar Plan

Overview of Plan

- Executive Summary & Introduction
- Background about Lidar
- Value and Benefit of Lidar to Minnesota
- Lidar Acquisition Areas of Interest
- Lidar Acquisition Specifications
- Elevation Products to be Derived from Lidar
- Cost Estimates
- Data management and Distribution
- Outreach Plan
- Educational Needs and Support

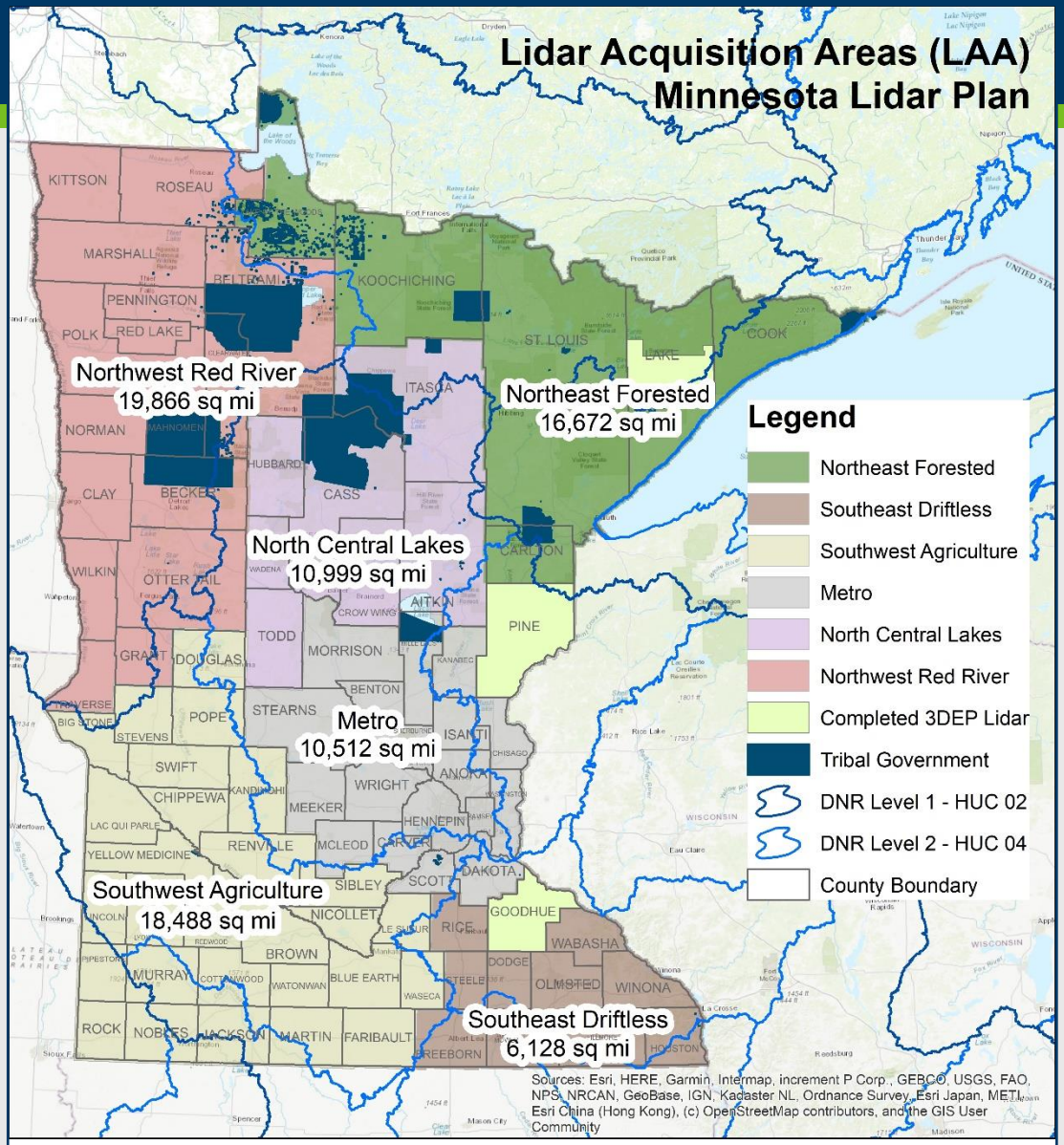
https://www.mngeo.state.mn.us/committee/3dgeo/acquisition/Minnesota_State_Lidar_Plan.pdf



Story Map

http://bit.ly/MnLidarPlanStoryMap

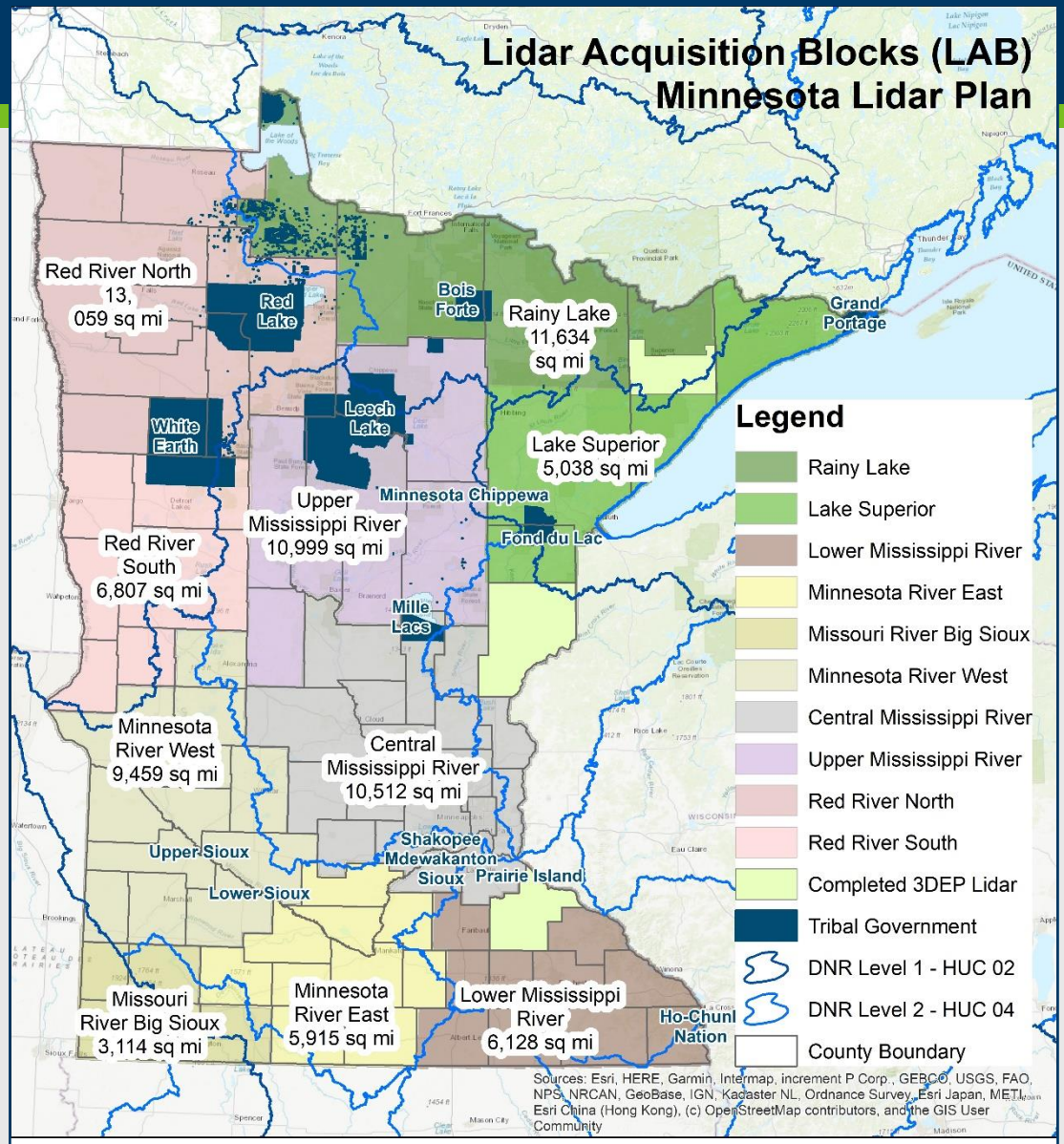
Lidar Acquisition Areas and Blocks of Interest



Tribal boundaries data source:
MnDOT, US Census Data Sept 2019

0 25 50 100 Miles

Map Date: Nov 16, 2020



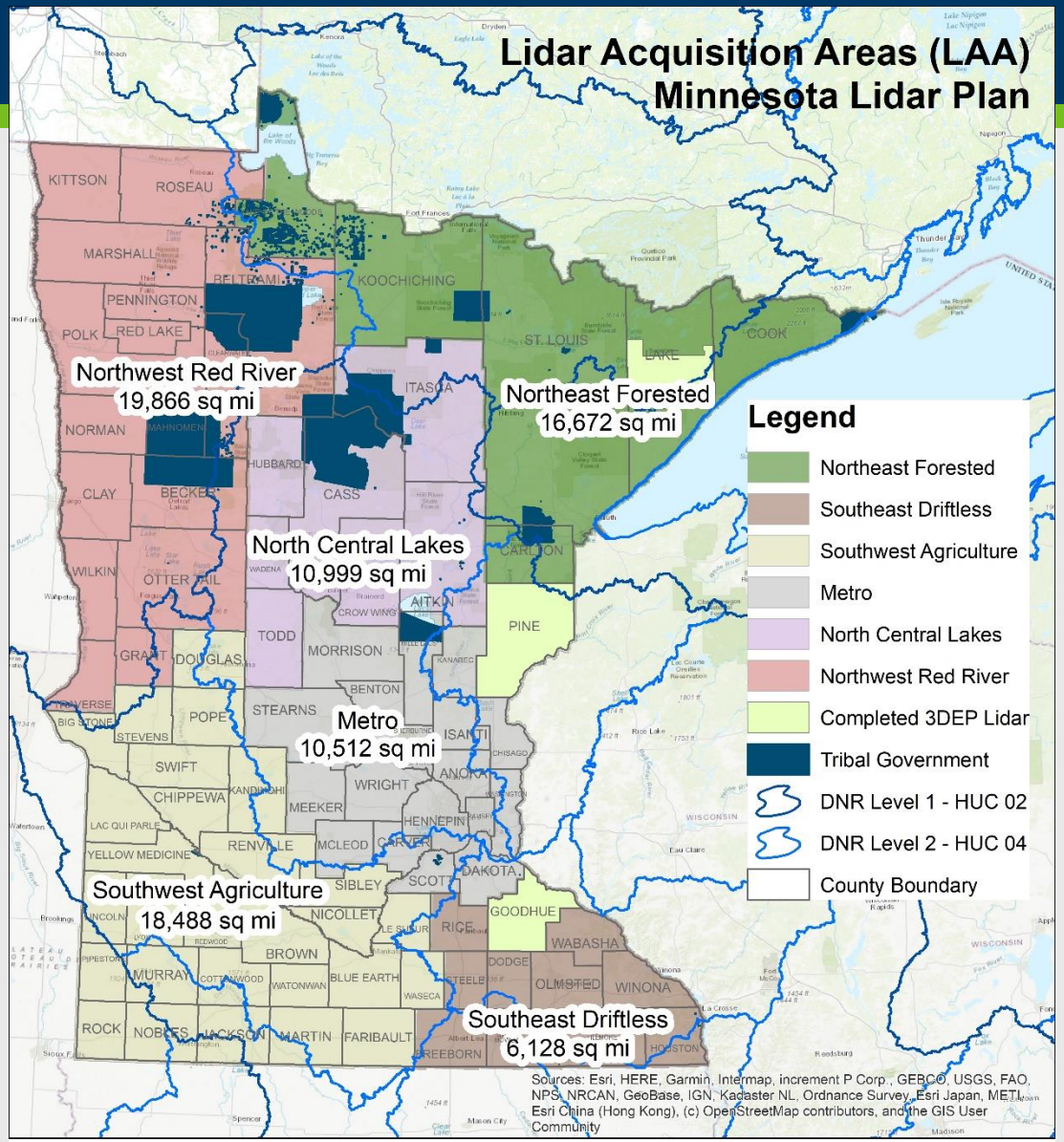
Tribal boundaries data source:
MnDOT, US Census Data Sept 2019

0 20 40 80 Miles

Map Date: Nov 16, 2020


Where:
Next Lidar
Collect

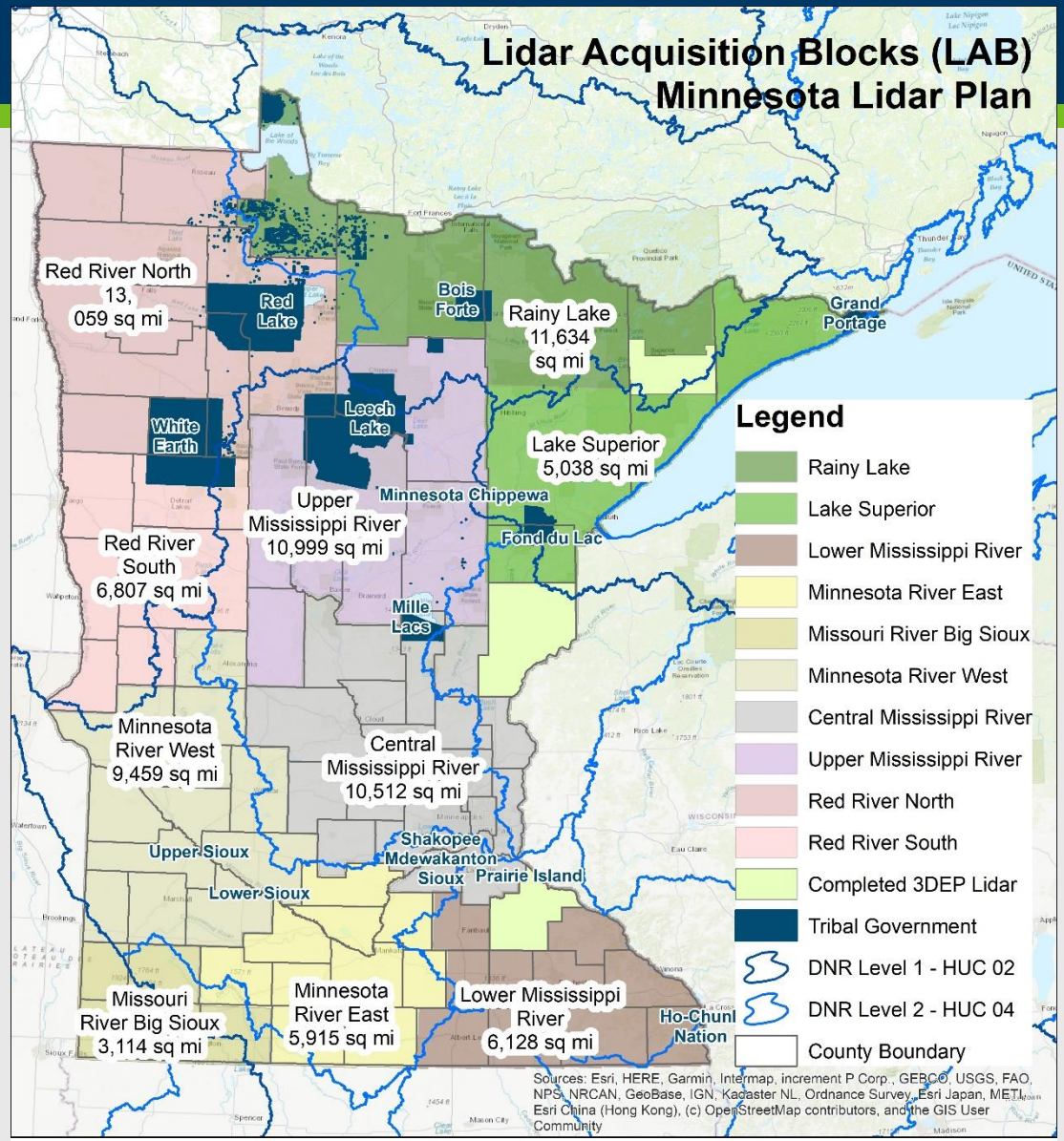
Lidar Acquisition Areas and Blocks of Interest



Tribal boundaries data source:
MnDOT, US Census Data Sept 2019

0 25 50 100 Miles

Map Date: Nov 16, 2020



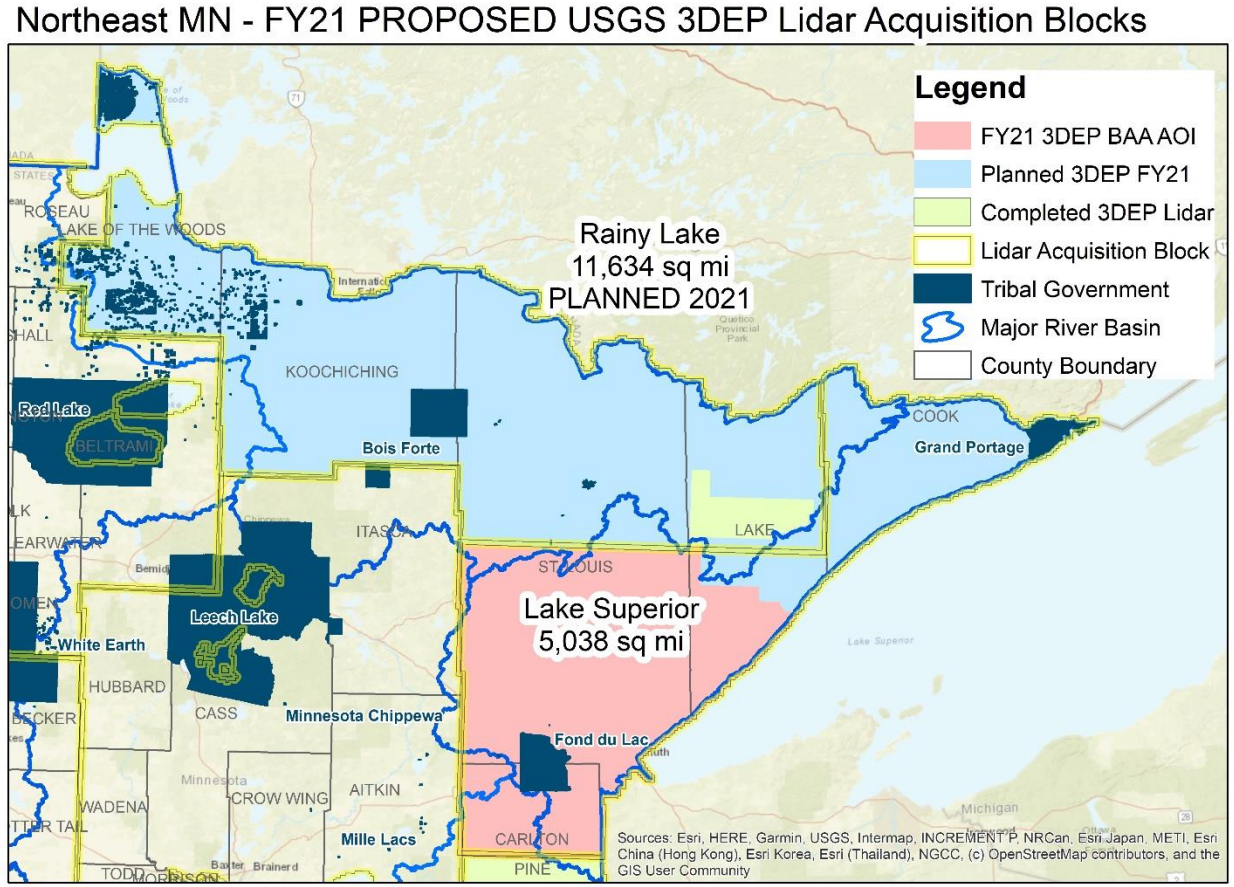
Tribal boundaries data source:
MnDOT, US Census Data Sept 2019

0 20 40 80 Miles

Map Date: Nov 16, 2020

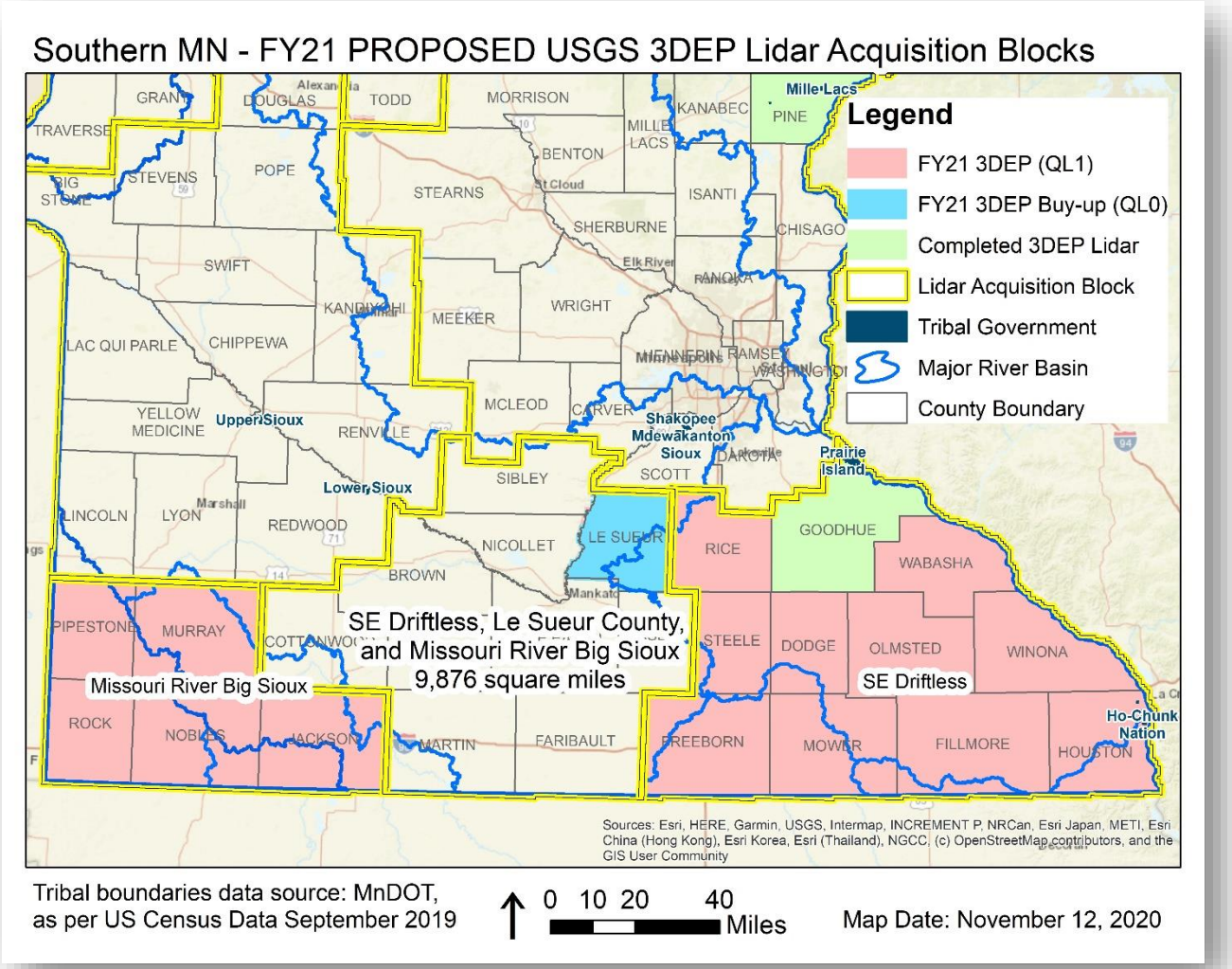
What is happening now?

- Rainy Lake is funded!!
  - QL1 Lidar to be flown Spring 2021
- Lake Superior application was just submitted for Spring 2021 as well, with the following partners:
  - USGS, NRCS State and Federal Offices, MN DNR, MnDOT, MnGeo, Lake and St Louis Counties

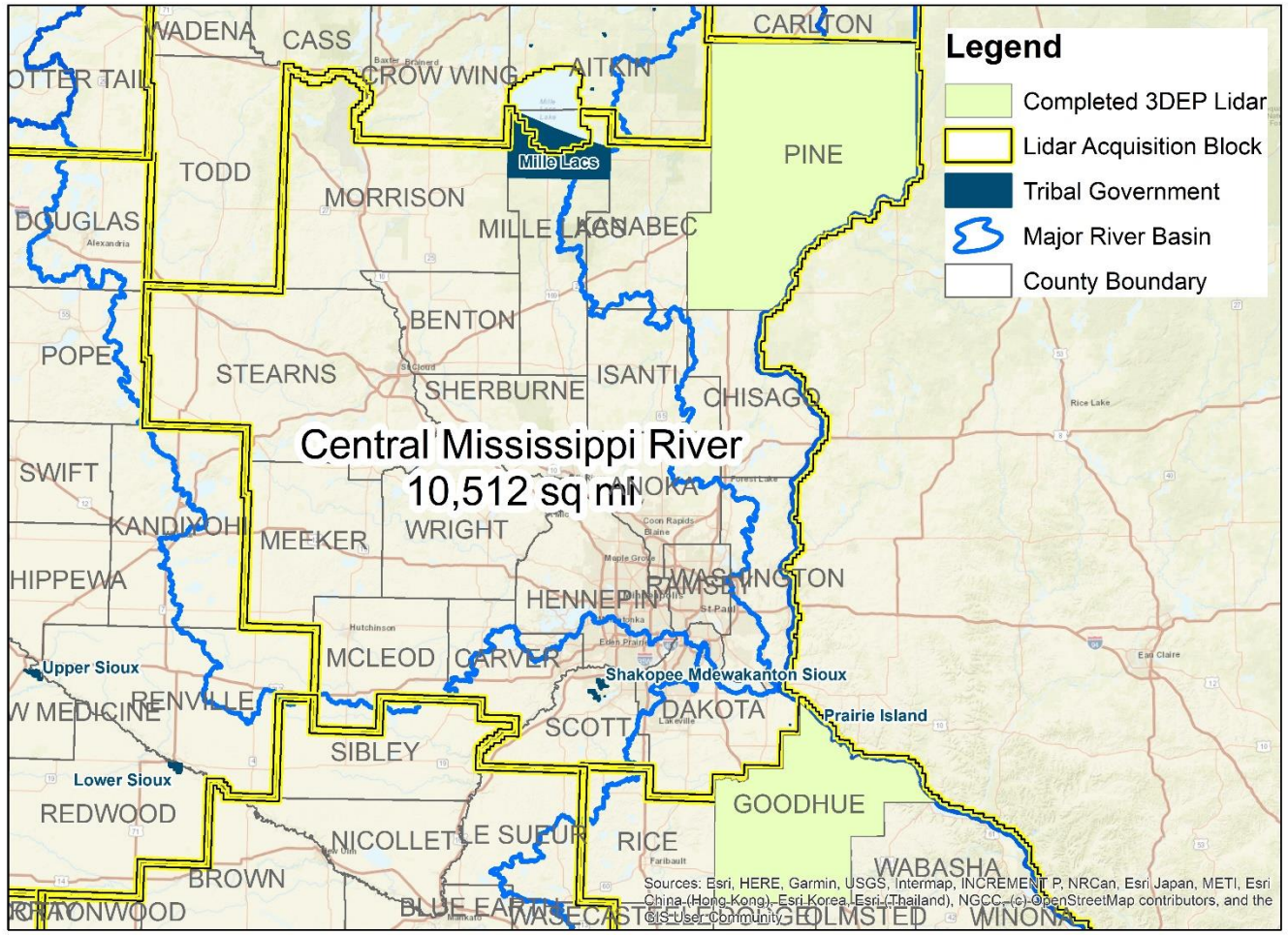


What is happening now?

- Goodhue County successfully collected **QL0 in Spring 2020**!
- **Pine** County also has 3DEP lidar, QL2
- The SE Driftless, Le Sueur, and Missouri River Big Sioux block applications were **submitted for Spring 2021**, with the following partners:
  - USGS, NRCS State and Federal Offices, MnDOT, MnGeo, and Nobles, Le Sueur, Winona, and other partners



Partners and Funds Needed: Central Mississippi River Lidar Acquisition Block



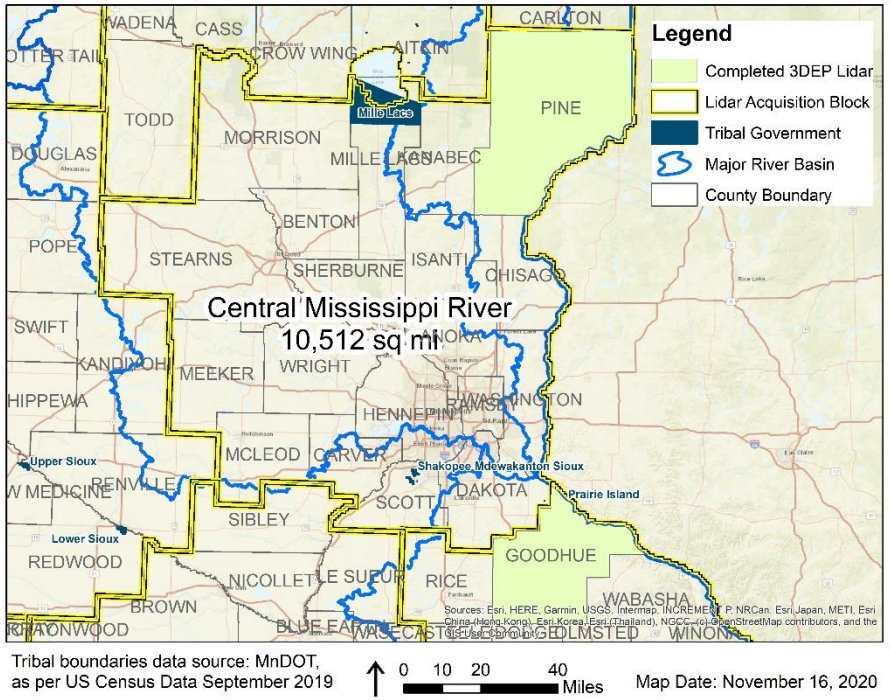
Estimated USGS 3DEP Contribution		Total Partner Contributions Needed	
%	$	%	$
40%	$1,387,584	60%	$2,081,376

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

Partners and Funds Needed: Central Mississippi River Lidar Acquisition Block

- TOTAL Est Funds Needed: $3,468,960
- Estimated using $330 per square mile for QL1
- 18 Counties* - 10,512 square miles
- Estimated cost for QL0 is $440.00 per sq mile

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**



*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

How:
You can Help

Potential costs of lidar in Minnesota

Quality Level (QL)	Average Cost per mi2*
QL-0	$440
QL-1	$330
QL-2	$200
QL-3	*$175*

*Please note that these 3D Geomatics Committee cost estimates are :

1. From 2020
2. Created from an average of USGS 3DEP Independent Government Cost Estimate (IGCE) quotes, but do not represent a single formal USGS or vendor-derived quote. The estimates are better than just an educated guess created by the 3D Geomatics Committee (referenced as such in our outreach information).
3. Based on estimates from other areas of the southern part of the state, these areas do not represent the human infrastructure of the 3DGeo Metro/Upper Mississippi Lidar Acquisition Area (LAA). Please note that completely resolving all features of the mapping of the human infrastructure of the Metro LAA with high density lidar could increase costs above early estimates

3DEP Program - Lidar Data

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
  - ✓ Collection Report . Survey Report - of all ground survey data . Flight Mission Report . Processing Report – Calibration & Classification . QA/QC Report – accuracy assessment . Georeferenced polygon swaths . Georeferenced polygon extents

3DEP Program - Lidar Data and Derived Products

Possible Added Deliverables

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

State Agency Lidar Derived Products

Foundational Derived Product

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

Outreach and educational materials

USGS science for a changing world

The 3D Elevation Program—Summary for Minnesota

Introduction

Elevation data are essential to a broad range of applications, including forest resources management, wildlife and habitat management, national security, recreation, and many others. For the State of Minnesota, elevation data are critical for agriculture and precision farming, natural resources conservation, flood risk management, infrastructure and construction management, water supply and quality, coastal zone management, and other business uses. Today, high-quality light detection and ranging (lidar) data are the sources for creating elevation models and other elevation datasets. Federal, State, and local agencies work in partnership to (1) replace data, on a national basis, that are (on average) 30 years old and of lower quality and (2) provide coverage where publicly accessible data do not exist. A joint goal of State and Federal partners is to acquire consistent, statewide coverage to support existing and emerging applications enabled by lidar data. The new 3D Elevation Program (3DEP) initiative (Snyder, 2012a,b), managed by the U.S. Geological Survey (USGS), responds to the growing need for high-quality topographic data and a wide range of other three-dimensional representations of the Nation's natural and constructed features.

Figure 1. Map of Minnesota showing the areal extent and quality levels of planned and existing publicly available light detection and ranging (lidar) data in November 2012. No lidar data that meet 3DEP requirements for quality level 2 or better are publicly available for Minnesota. See table 2 for quality levels.

3D Elevation Program Benefits for Minnesota

The top 10 Minnesota business uses for 3D elevation data, which are based on the estimated annual benefits of the 3DEP initiative, are shown in table 1. National Enhanced Elevation Assessment (NEEA; Dewberry, 2011) survey respondents in the State of Minnesota estimated that the national 3DEP initiative would result in at least $13 million in new benefits annually to the State. The cost for such a program in Minnesota is approximately $28 million, resulting in a payback period of 2.1 years and a benefit-to-cost ratio of 3.9 to 1 over an 8-year period. Because monetary estimates were not provided for all reported benefits, the total benefits of the 3DEP to Minnesota are likely much higher. On the basis of the NEEA survey results, all levels of government and many organizations in Minnesota could benefit from access to statewide high-resolution elevation data.

The NEEA evaluated multiple data-collection programs to determine the optimal data quality and data replacement cycle relative to cost to meet the stated needs. For Minnesota, approximately 76 percent of the total benefits are realized in agriculture and precision farming and natural resources conservation uses alone, as shown in table 1. The status of publicly available lidar data in Minnesota is shown in figure 1. By enhancing coordination between the 3DEP and the various government and private organizations in Minnesota, it may be possible to meet a higher percentage of the needs.

3DEP in Minnesota by the Numbers

Expected annual benefits	$13.64 million
Estimated total cost	$28.15 million
Payback	2.1 years
Quality level 1 buy-up estimate	$17.91 million

3D Elevation Program

3DEP is a national program managed by the USGS to acquire high-resolution elevation data. The initiative is backed by a comprehensive assessment of requirements (Dewberry, 2011) and is in the early stages of implementation. 3DEP will improve data accuracy and provide more current data than is available in the National Elevation Dataset (NED). The goal of this high-priority cooperative program is to be operational by January 2015 and to have complete coverage of the United States by 2022, depending on funding and partnerships. The new program has the potential to generate $13 billion/year in new benefits through improved government services, reductions in crop and homeowner losses resulting from floods, more efficient routing of vehicles, and a host of other government, corporate, and citizen activities (Dewberry, 2011).

Benefits of a Funded National Program

- Economy of scale—Acquisition of data covering larger areas reduces costs by 25 percent.
- A systematic plan—Acquisition of data at a higher quality level reduces the cost of "buying up" to the highest levels needed by State and local governments.
- Higher quality data and national coverage—Ensure consistency for applications that span State and watershed boundaries and meet more needs, which results in increased benefits to citizens.
- Increase in Federal agency contributions—Reduces State and local partner contributions.
- Acquisition assistance—Provided through readily available contracts and published acquisition specifications.

U.S. Geological Survey
2280 Woodale Drive
Mounds View, MN 55112
Email: rwencl@usgs.gov

http://nationalmap.gov/3DEP/

By William J. Carswell, Jr.

MINNESOTA IT SERVICES

Minnesota Lidar Acquisition Plan Fact Sheet

Background

The 3D Geomatics Committee (3DGeo) of the Minnesota Geospatial Advisory Council (GAC) is working closely with the Minnesota Geospatial Information Office (MnGeo) under Minnesota IT Services (MNIT) to engage the geospatial community in developing, promoting, and funding a statewide high-density (HD) lidar acquisition plan for Minnesota. Higher-density and higher-quality lidar will dramatically improve our ability to analyze the landscape in Minnesota, inventory public and private infrastructure and assets, and plan for current and future scenarios, in support of better decision making for our natural, cultural, and built environments.

- This will be a 5 year or longer effort with a grant request to the federal government each year.
- The plan covers acquisition of all lands within the state boundary - 86,943 square miles
- We are engaging partners in, state, federal, regional, and local government, tribal nations, academia, non-profit, and private sectors to contribute to the plan and funding.
- We will be seeking funding from the federal government through a US Geological Survey (USGS) grant program called a broad agency announcement (BAA) managed under the USGS 3D Elevation Program (3DEP).
  - Federal cost share averages about 38% of the cost but can cover as much as 75% depending on needs of federal agencies
- MNIT/MnGeo is the principal for this year's grant application and would likely be the aggregator and distributor for the data products generated over the course of this project and beyond.

Additional resources that can provide more information about upcoming plans for lidar in Minnesota:

- Minnesota State Lidar Plan
- Story Map about the Minnesota State Lidar Plan

Benefits

Expected annual benefits are $13.64 million. Based on an estimated total acquisition cost of $34.8 million for quality level 1 data, the payback would be 2.6 years. The top 10 Minnesota business uses for 3D elevation data, which are based on the estimated annual benefits of the 3DEP initiative, are shown in the table-1 below.

Rank	Business use	Annual benefits (millions)
1	Agriculture and precision farming	$8.90
2	Natural resources conservation	3.38
3	Flood risk management	1.10
4	Infrastructure and construction management	0.64
5	Water supply and quality	0.47
6	Coastal zone management	0.41
7	Forest resources management	0.33
8	Geologic resource assessment and hazard mitigation	0.15
9	Aviation navigation and safety	0.14
10	Renewable energy resources	0.07
	Other	0.03
	Total	13.62

Table 1 - Estimated Annual Benefits of Lidar, Source: National Enhanced Elevation Assessment for Minnesota (Dewberry, 2011)

As customers of government agencies, citizens expect spatial data mapping of building placement, flood modeling, and water features are in harmony with the imagery on their phone. When agency data is out of date and at lesser resolution the bond of trust between the citizen and the agency providing services is broken.

MINNESOTA

Minnesota State Lidar Plan – Announcement

Overview

The Minnesota 3D Geomatics Committee and the State Geospatial Information Office, MnGeo, have developed a draft Lidar Plan for the State of Minnesota that will help guide the acquisition of new statewide lidar data over the next five years.

The State Lidar Plan seeks to outline collection timelines, standards, end user needs, products, and storage/dissemination methods.

Call to Action

Please contact us for more on the State Lidar Plan.

- Identify and share requirements and business use cases
- Provide your desired areas of interest and product needs
- Let us know if you can help provide matching funds
- Check out the draft State Lidar Plan and StoryMap on the web

Get involved: Contact
https://www.mngeo.state.

Need for Lida

Lidar data prov
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to save costs i
infrastructure,
forestry. Lidar
a multitude of

Funding Oppo

The USGS 3D E
data and creat
Nationwide. This program has been successful in our region, but our current lidar data does not meet the new specifications.

Every fall, the USGS has a call for proposals to apply for grant funding to match local partnerships. To receive federal funding, we must provide a non-federal funding match. We are currently reaching out to
high quality lid
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others depend
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State Lidar Plan

MINNESOTA

The Minnesota 3D Geomatics Committee and the State Geospatial Information Office, MnGeo, have developed a 5-year draft plan to help guide the acquisition of new statewide lidar data.

Deliverables proposed include a lidar point cloud, digital elevation model, canopy height model, and more depending on stakeholder needs and funding.

www.mngeo.state.mn.us/committee/3dgeo/

Get Involved!

- Let us know if you can help
- Share requirements and business use cases
- Provide areas of interest and product needs

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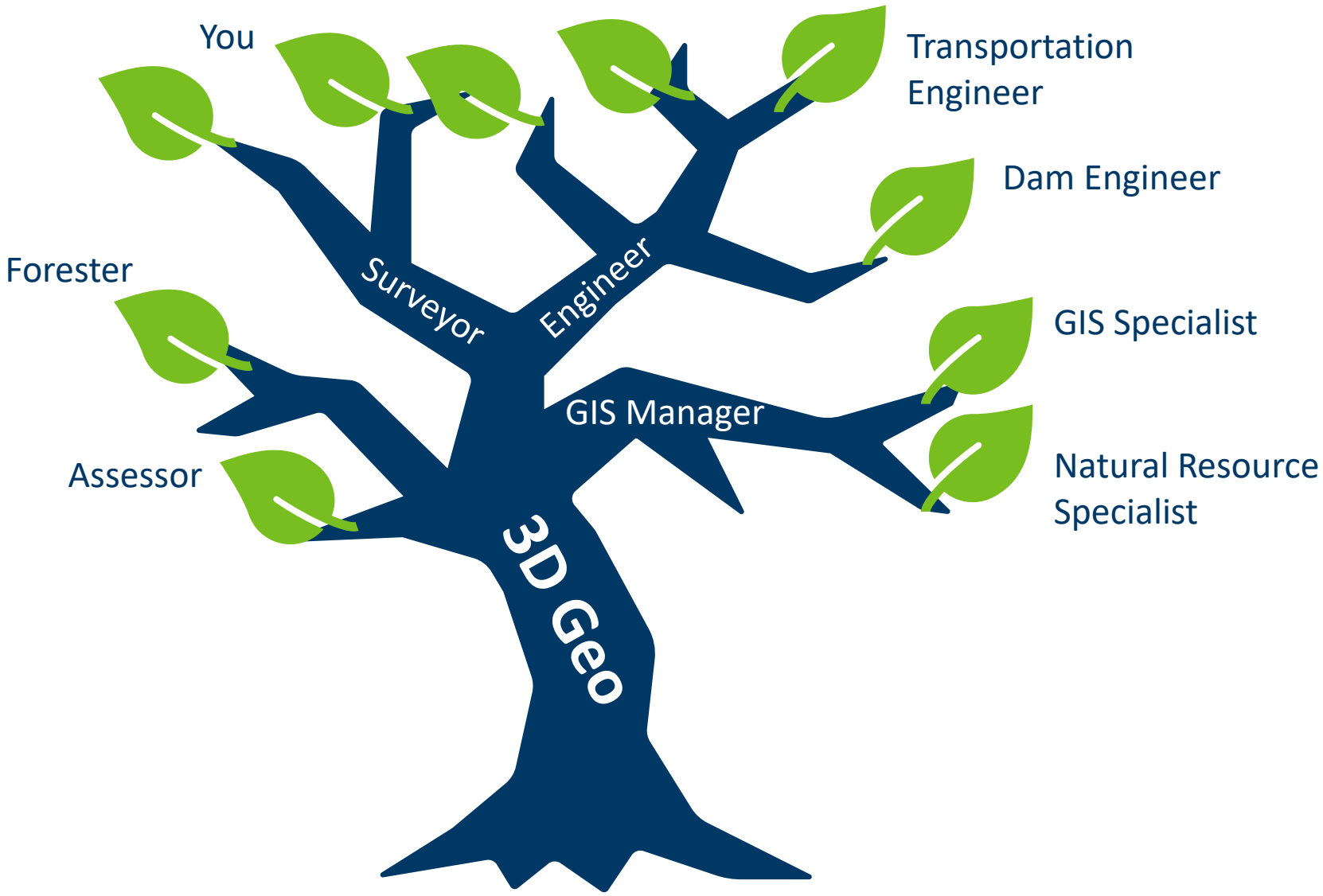
http://bit.ly/MnLidarPlanStoryMap

Next steps

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

You can be a voice of support . . .

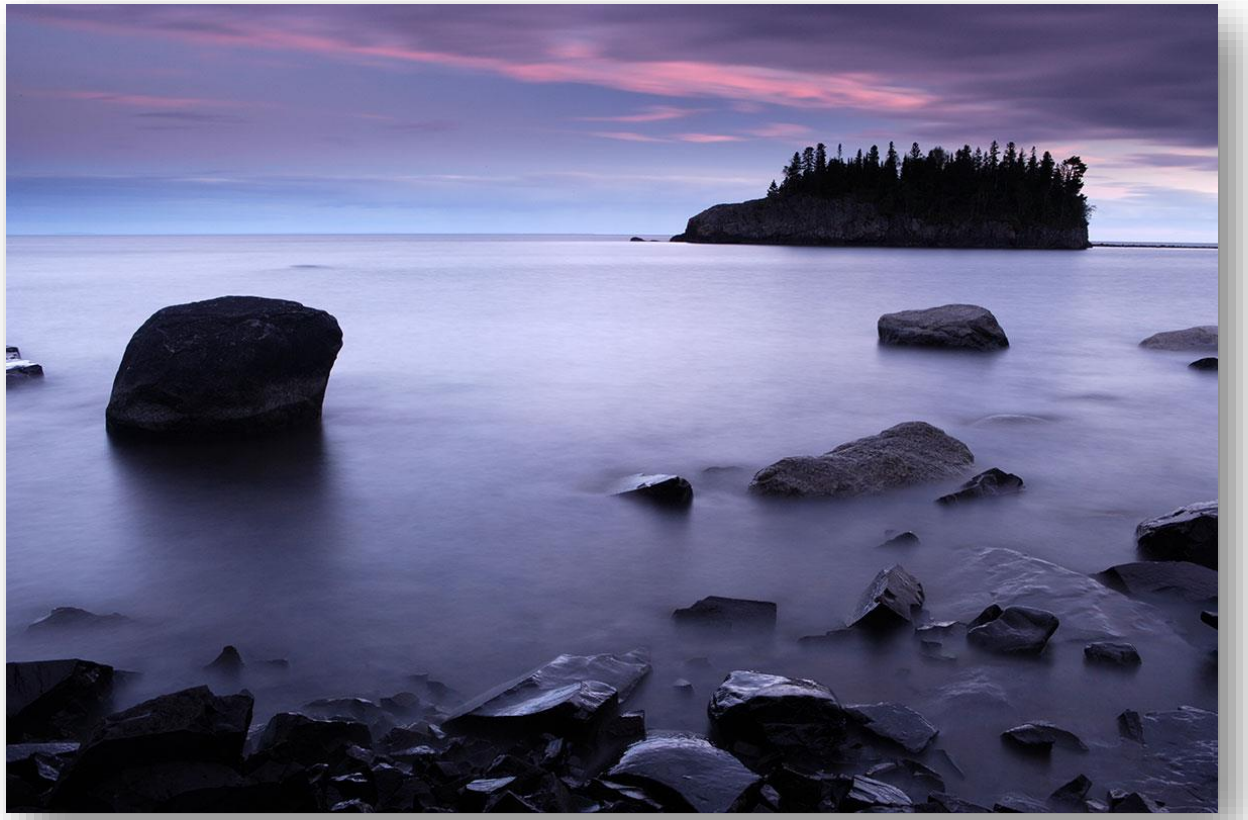
A collaborator



Next steps

We need partners to help fund lidar acquisition!

- Check out the Minnesota Plan & StoryMap
- Stay in touch
  - Get on the Minnesota GIS News GovDelivery list
    - https://www.mngeo.state.mn.us/newsletter.html
  - Email 3DGeo
    - lidar@state.mn.us
- Openly discuss the need for new lidar with managers and decision makers.



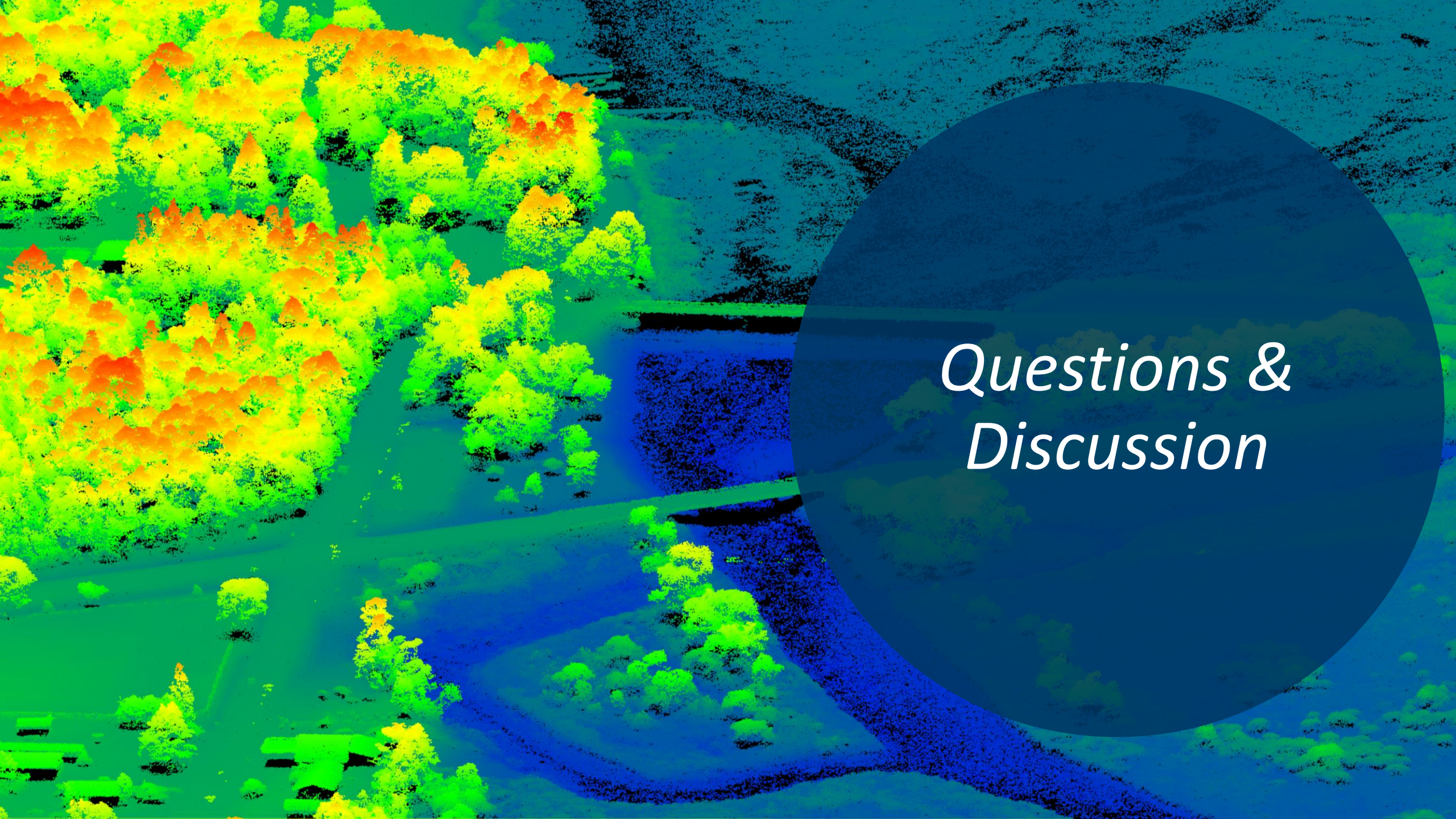
Additional Resources

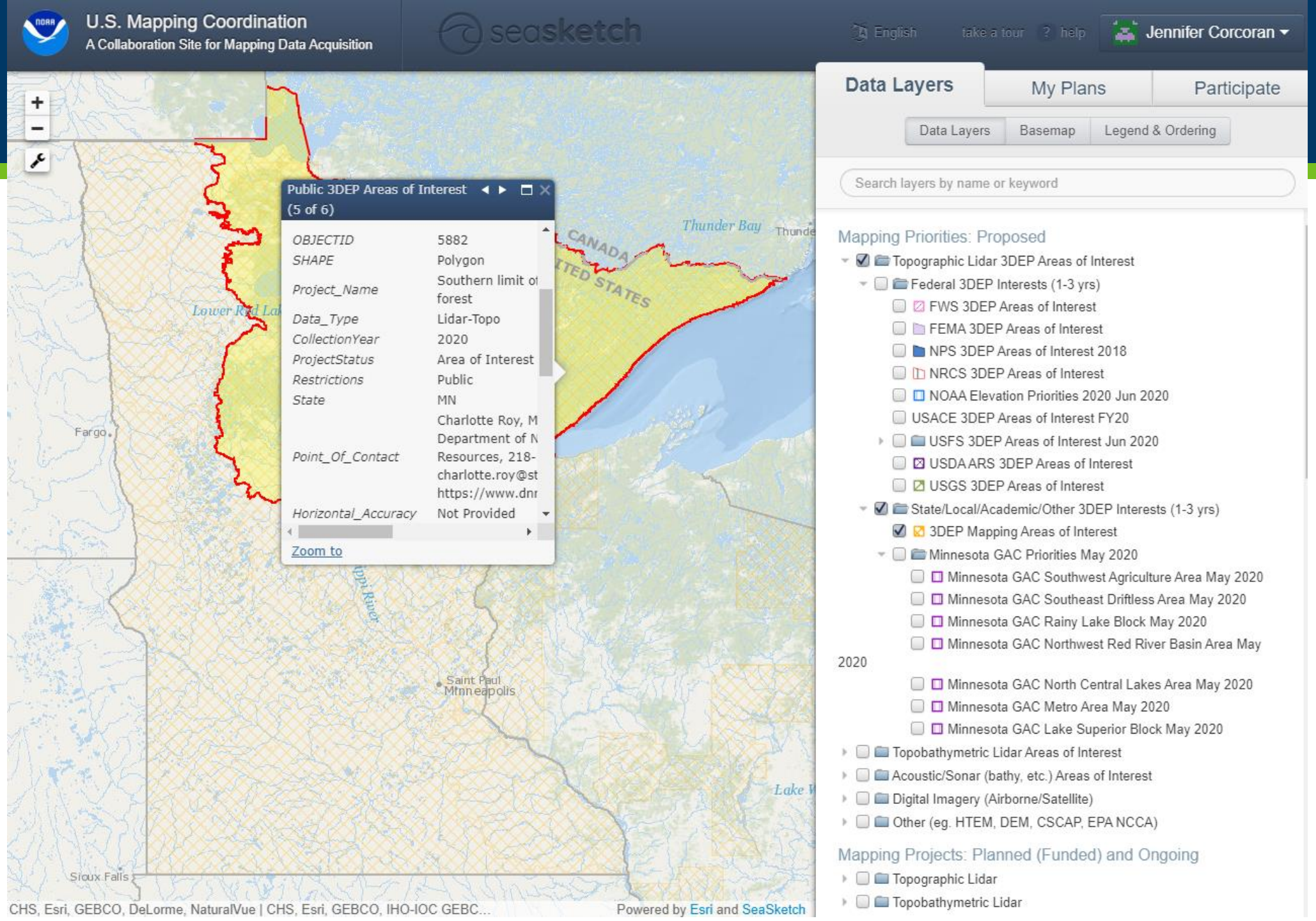
Minnesota Lidar Plan

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

Story Map about the Minnesota Lidar Plan

http://bit.ly/MnLidarPlanStoryMap


Questions &
Discussion


U.S. Mapping Coordination
A Collaboration Site for Mapping Data Acquisition
seasketch
English
take a tour
help
Jennifer Corcoran
Data Layers
My Plans
Participate
Data Layers
Basemap
Legend & Ordering
Search layers by name or keyword
Public 3DEP Areas of Interest
(5 of 6)
OBJECTID 5882
SHAPE Polygon
Project_Name Southern limit of forest
Data_Type Lidar-Topo
CollectionYear 2020
ProjectStatus Area of Interest
Restrictions Public
State MN
Point_Of_Contact Charlotte Roy, M Department of N Resources, 218- charlotte.roy@st https://www.dnr
Horizontal_Accuracy Not Provided
Zoom to
Thunder Bay
CANADA
Fargo
Saint Paul
Minneapolis
Sioux Falls
Mapping Priorities: Proposed
Topographic Lidar 3DEP Areas of Interest
Federal 3DEP Interests (1-3 yrs)
FWS 3DEP Areas of Interest
FEMA 3DEP Areas of Interest
NPS 3DEP Areas of Interest 2018
NRCS 3DEP Areas of Interest
NOAA Elevation Priorities 2020 Jun 2020
USACE 3DEP Areas of Interest FY20
USFS 3DEP Areas of Interest Jun 2020
USDA ARS 3DEP Areas of Interest
USGS 3DEP Areas of Interest
State/Local/Academic/Other 3DEP Interests (1-3 yrs)
3DEP Mapping Areas of Interest
Minnesota GAC Priorities May 2020
Minnesota GAC Southwest Agriculture Area May 2020
Minnesota GAC Southeast Driftless Area May 2020
Minnesota GAC Rainy Lake Block May 2020
Minnesota GAC Northwest Red River Basin Area May 2020
Minnesota GAC North Central Lakes Area May 2020
Minnesota GAC Metro Area May 2020
Minnesota GAC Lake Superior Block May 2020
Topobathymetric Lidar Areas of Interest
Acoustic/Sonar (bathy, etc.) Areas of Interest
Digital Imagery (Airborne/Satellite)
Other (eg. HTEM, DEM, CSCAP, EPA NCCA)
Mapping Projects: Planned (Funded) and Ongoing
Topographic Lidar
Topobathymetric Lidar
CHS, Esri, GEBCO, DeLorme, NaturalVue | CHS, Esri, GEBCO, IHO-IOC GEBC...
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