



# Overview of the Montana Imagery Working Group

Erin Fashoway and Troy Blandford

Prepared for the Idaho Imagery Technical Working Group | June 6, 2024

# Discussion Topics

- Montana GIS organization and structure (MGIAC, Montana Spatial Data Infrastructure, Working Groups . . .)
- Purpose of the Imagery Working Group
  - Kickoff - MT Imagery Summit, December 2023
- Current state of imagery in Montana
  - Montana Air Photo Browser
  - Other state imagery
    - Boxes and boxes...where are they
    - Ongoing, upcoming, such as UAS
  - Requests for imagery
- Work Group participants – who is interested
- Initial tasks of the working group
  - Learn from other states and imagery vendors
  - Charter
  - Inventory of existing imagery
  - Imagery business uses and critical activities.
    - Interesting uses
  - Legislative requests
    - Must be flexible and reassess with current resources
    - Other funding opportunities?
- Anyone is welcome to join the MT imagery WG meetings (approximately monthly around the middle of the month)

# GIS Coordination

# *The State of Montana*

## **GIS Coordination in the State of Montana**



**MONTANA  
STATE LIBRARY**

**GIS COORDINATION**

### Public Land Ownership

- Bureau of Land Management
- US Fish and Wildlife
- National Park Service
- US Forest Service
- US Dept of Agriculture
- Montana State Trust Land
- State of Montana - Miscellaneous



### 2010 Montana Facts

Montana Total Area: 545,892 Sq. Miles | Largest County: Beaverhead, 5,543 Sq. Miles | Smallest County: Silver Bow, 718 Sq. Miles  
Largest City: Billings, Yellowstone County, Population 104,170 | Smallest County Seat: Winnett, Petroleum County, Population 182  
Major Rivers: Yellowstone River, Missouri River, Clark Fork River | High Point: Granite Peak 12,799 ft | Low Point: Kootenai River 1000 ft



# Montana State Library Geospatial Statute Activities & Programs

- State GIS Coordination
- Montana Spatial Data Infrastructure
- Natural Resource Information System
  - Water Information System
  - Natural Heritage Program
- State Realtime Network



# Montana Geospatial Information Act

- State GIS Coordination
- Advisory Council
- **Montana Spatial Data Infrastructure**
- Grant Program
- Geospatial Information Plan
- GIS Coordination Strategic Plan

# Montana Geospatial Information Act

## Modernized & Updated Language

### Section 90-1-401 – 90-1-413

**90-1-404 – Geospatial information -- management -- duties of state library.** (1) The state library shall:

(b) work with all stakeholders, including but not limited to federal, state, local, private, and tribal entities, to prioritize needs and collect, develop, maintain, and disseminate geographic information systems, geospatial information, and geospatial technologies;

# Montana Geospatial Information Plan

90-1-404(c) prepare a geospatial information plan and operate according to the provisions of the plan.

The plan:

- (i) must be created in consultation with the council;
- (ii) may include but is not limited to:
  - (A) the prioritized needs to collect, maintain, and disseminate geospatial information;
  - (B) priorities for geospatial coordination; and
  - (C) priorities for grant awards; and
- (iii) must be reviewed and, if appropriate, updated every 3 years;

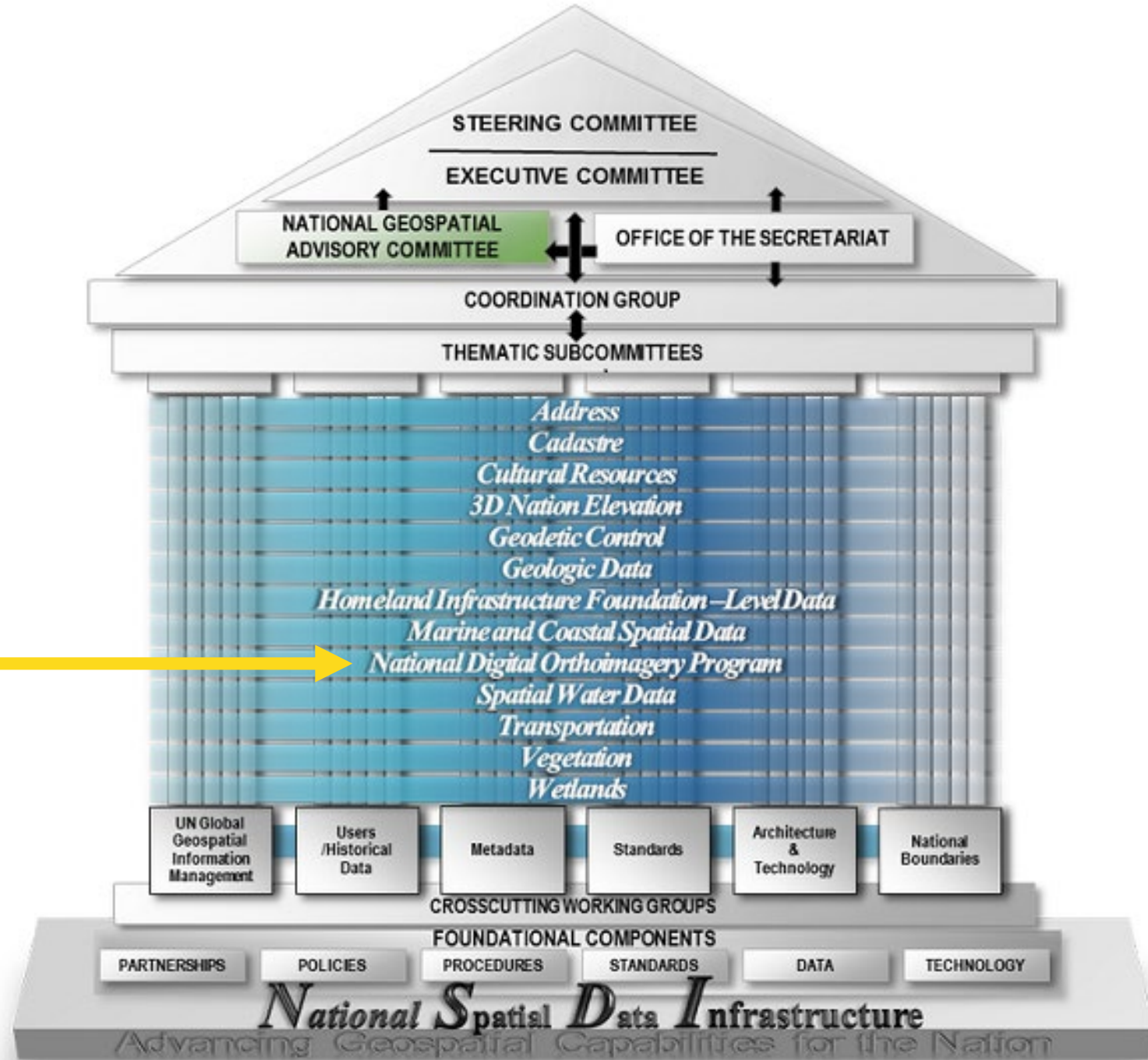


# Montana Geospatial Advisory Council (MGIAC)

Jennie Stapp	State Librarian or Designee – Chair	Montana State Library
Brian Demarco	Tribal Gov't Interests Representative*	Siyeh Communications
Adam Carpenter	Director of the Dept. of Administration	Montana Dept. of Administration
Karen Coleman	State Agency Director	Montana Dept. of Natural Resources & Conservation
Lee Macholz	Municipal Gov't Representative*	City of Missoula
Maureen Celandier	County Gov't Representative*	Custer County
Allen Armstrong	Federal Gov't Representative*	USDI: Bureau of Land Management
Valentijn Hoff	Montana University System Representative*	University of Montana
Eric Spangenberg	MT Association of GIS Professionals Representative*	MAGIP
vacant	Montana Association of Registered Land Surveyors Representative*	tbd
vacant	Private Business (Active in GIS) Representative*	tbd

# MGIA Council Advisement

- GIS Coordination Strategic Plan
- Geospatial Information Plan & Budget
- Grant Program Priorities
- Best Practices & Standards
- GIS Coordination & Outreach Activities
- Montana Spatial Data Infrastructure



# Montana Spatial Data Infrastructure Framework Themes



1. Administrative Boundaries\*
2. Cadastral\*
3. Climate
4. Elevation\*
5. Geographic Names
6. Geology
7. Hydrography\*
8. Hydrologic Units
9. Imagery\* ←
10. Land Cover
11. Mapping Control\*
12. Soils
13. Structures & Addresses\*
14. Transportation\*
15. Wetlands & Riparian

*\* Indicates a National Spatial Data Infrastructure (NSDI) Layer*

# Manage & Maintain MSDI Framework Themes

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- Data creation/collection
- Data maintenance
- Publicly Accessible Geospatial Information
- Working Groups
- Theme Plans
- Best Practices

## Theme

## Steward

## Lead

Administrative Boundaries \*

Montana State Library

Meghan Burns

Cadastral \*

Montana State Library

Jeff Hedstrom

Climate

University of Montana

Dr. Kelsey Jencso

Elevation \*

Montana State Library

Troy Blandford

Geographic Names

Montana State Library

Vacant - geoinfo@mt.gov

Geology

Bureau of Mines & Geology

John Sanford

Hydrography \*

Montana State Library

Troy Blandford

Hydrologic Units

Natural Resources Conservation Service

Nathan Parry

Land Cover

U of M Spatial Analysis Lab

Jessica Mitchell

Mapping Control \*

Montana State Library

Bob Holliday

Imagery \*

Montana State Library

Erin Fashoway

Soils

Natural Resources Conservation Service

Nathan Parry

Structures & Addresses \*

Montana State Library

Michael Fashoway

Transportation \*

Montana State Library

Michael Fashoway

Wetlands & Riparian

Montana State Library & | Dept. of Envrnmntl. Quality

Bryce Maxell | Steve Carpenedo

## *Collaboration: Imagery Working Group*

- Develop Standards for Imagery Data
- Create an Inventory of Existing Data
- Understand Business Uses and Critical Activities
- Explore Cost Efficiencies of Shared Resources
- Develop MSDI Imagery Plan





# Standards & Best Practices

- Create Geospatial Information & Technology Standards & Best Practices
  - Widely Used
  - Create Efficiencies
  - Reduces Duplicative Efforts
  - Saves Time
  - Saves Money





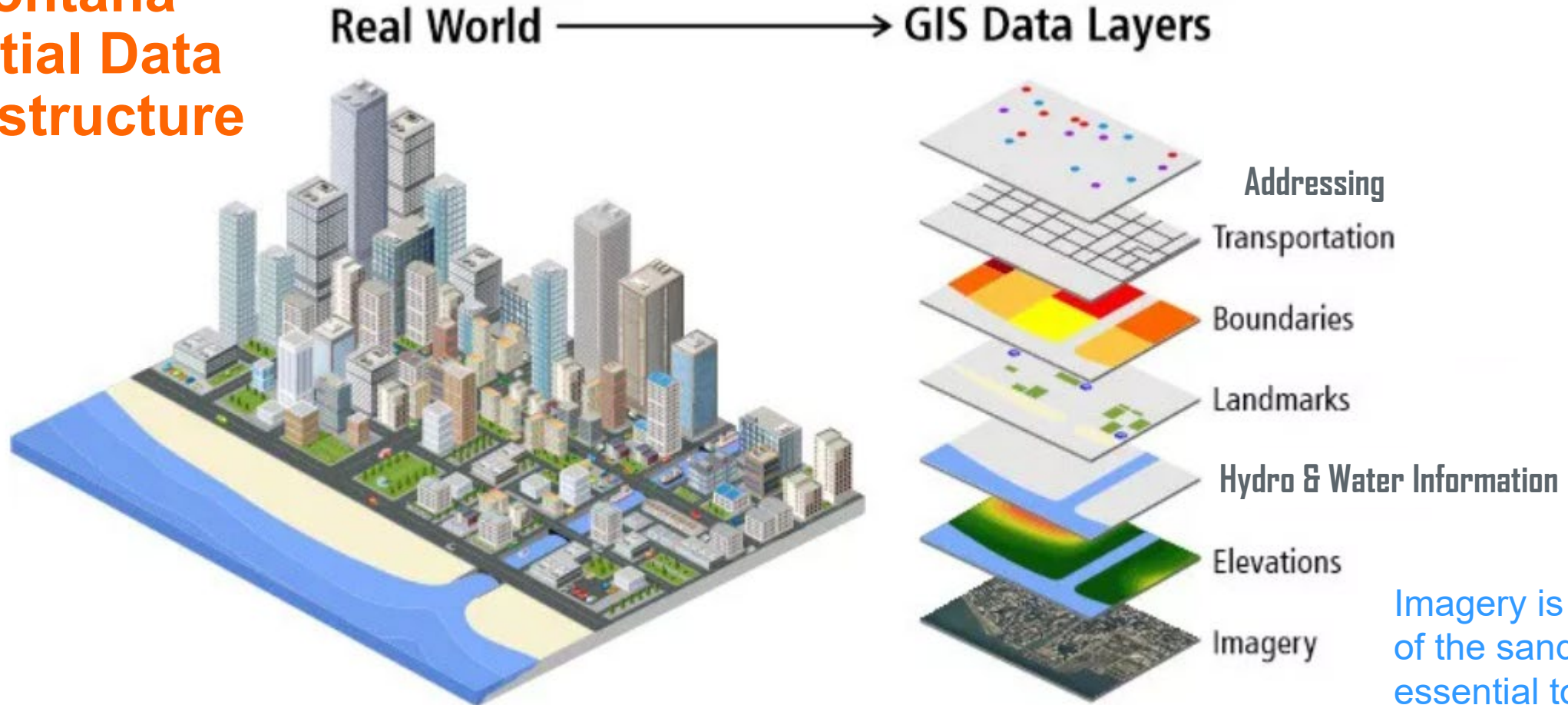
# Promotion & Communication

- Provide Training
  - Subject Matter Expert Webinars, Case Studies, hands-on
- Provide Expertise
- Communicate to Stakeholder Communities
  - GovDelivery, Email, Website, Direct Invites, Summits, Working Group Meetings
- Supportive Grant Program
- Represent Montana Locally, Regionally, & Nationally
  - Present to stakeholder groups



# Coordination Makes It Possible!

## Montana Spatial Data Infrastructure



A GIS map combines layers of data representing real world locations and entities

Imagery is the bottom of the sandwich, essential to many of the MSDI layers.

# Imagery Working Group Remix



# Montana Imagery Summit, Dec. 12th-13th, 2023

## Day 1

9:00 AM - 9:30 AM **Networking & Registration** - Light Breakfast and Coffee Provided for In-Person Attendees. Sponsored by NV5

9:30 AM - 9:40 AM **Welcome & Opening Remarks**

9:40 AM - 10:45 AM **Organization Imagery Roll Call**, Learn about the Imagery Needs of City, County, & State Agencies

10:45 AM - 11:00 AM **Break**

11:00 AM - 12:15 PM **Indiana State Imagery Program**, Megan Compton, Indiana GIO  
**Kentucky State Imagery Program**, Kent Anness, Kentucky GIO

12:15 PM - 1:00 PM **Lunch Break** - Provided for In-Person Attendees

1:00 PM - 1:30 PM **USDA NAIP Update**, James Merrill, USDA

1:30 PM - 2:50 PM **Using Imagery to Calculate Agriculture Use Value**, Andy Freckman, Woolpert

**Bringing Historic Aerial Photography Datasets into the Digital Age**, Tyler Kaebisch, Ayres

**Historical Imagery: 1968 Air Photos Over Glacier National Park**, Cody Benkelman, Esri

**Unlock Deeper Insights with High-Resolution Statewide Aerial Data**, Rob Eadie, Hexagon

2:50 PM - 3:10 PM **Break** - Sponsored by Sanborn

3:10 PM - 4:50 PM **Cultural Resources Inventory**, Jacob Thiel, Dewberry

**Addressing the Growing Risk and Increased Costs of Floods**, Thomas Peck, Ecopia

**Imagery as a Solution**, Jason Caldwell, Sanborn

**Imagery for Land Cover, NG9-1-1, & Geologic Hazards**, Angie Pelkie, Fugro

**Better Answers Now, Not Later – Prioritizing Business & Workflow with AI/ML**, Mark Christian, Vexcel

4:50 PM - 5:00 PM **Closing Remarks**

5:00 PM - 7:00 PM **Imagery Social & Mappy Hour** - Please plan to stay & continue the discussion.  
*Happy Hour sponsored by Eagleview and Fugro*

## Day 2

9:00 AM - 9:30 AM **Registration & Networking** - Light Breakfast Provided for In-Person Attendees. Coffee today sponsored by Hexagon.

9:30 AM - 9:45 AM **Welcome & Introductions**

9:45 AM - 10:00 AM **Review & Major Take-Aways of the Imagery Summit Day 1**

10:15 AM - 10:30 AM **Status of the MSDI Imagery Framework**

10:30 AM - 11:45 AM **Goals of the Working Group**

**Discussion Topics** (other discussion topics welcomed)

*Including 15 Minutes Break (10:45 - 11:00a)*

**Inventory/ROI/Needs Assessment**

**Legislative Planning**

**MSDI Imagery Plan**

11:45 AM - 12:15 PM **Procurement Discussion**

**State of Ohio Example**, Jeff Lovin, Woolpert

12:15 PM - 1:00 PM **Lunch Break** - Provided for In-Person Attendees

1:00 PM - 1:45 PM **Imagery Management**, David Wright, Esri

1:45 PM - 2:00 PM **Closing - Next Steps - Assignments - Future Meetings**

Thank you to the Event Sponsors.



Presentation slides and recordings at:  
<https://msl.mt.gov/geoinfo/msdi/orthoimagery/>



# MT Imagery Summit

## “Roll Call” Session

- State (5), Local Gov (3), University (1) and Tribal were invited to participate
- Each organization was given the same four questions:
  1. Describe the aerial imagery your organization has and how it is made available
  2. What are your top 2 to 3 business uses for imagery?
  3. What are your challenges with imagery (top 2 to 3 pain points)?
  4. What would you want to see out of a state imagery program (your vision)?
- Presenters will take 5-minutes to answer any or all questions
- Additional interested organizations will have time at the end to provide input

# Imagery Roll-Call Participants

1. Montana State Library
2. MT Department of Natural Resources
3. MT Dept. of Transportation
4. MT Department of Revenue
5. MT Department of Environmental Quality
6. University of Montana, Mansfield Library
7. City of Missoula
8. City of Bozeman
9. Yellowstone County
- ... Open Mic!



# Montana Imagery Summit

## Key Takeaways (or the purpose of the working group)



Multiple organizations have imagery. Imagery is challenging to find and obtain. There is a need for a **repository and inventory of existing imagery**.



Need for productive **collaborations and coordination across agencies** that collect or use imagery. Value increases with more use.



Current statewide imagery (NAIP) **does not meet Montana needs**, such as resolution and leaf-off. 6" to 1 foot required.



Need to identify **funding opportunities** and strategies for outreach. Strong desire for one point, one payment contract and ability to readily buyup.

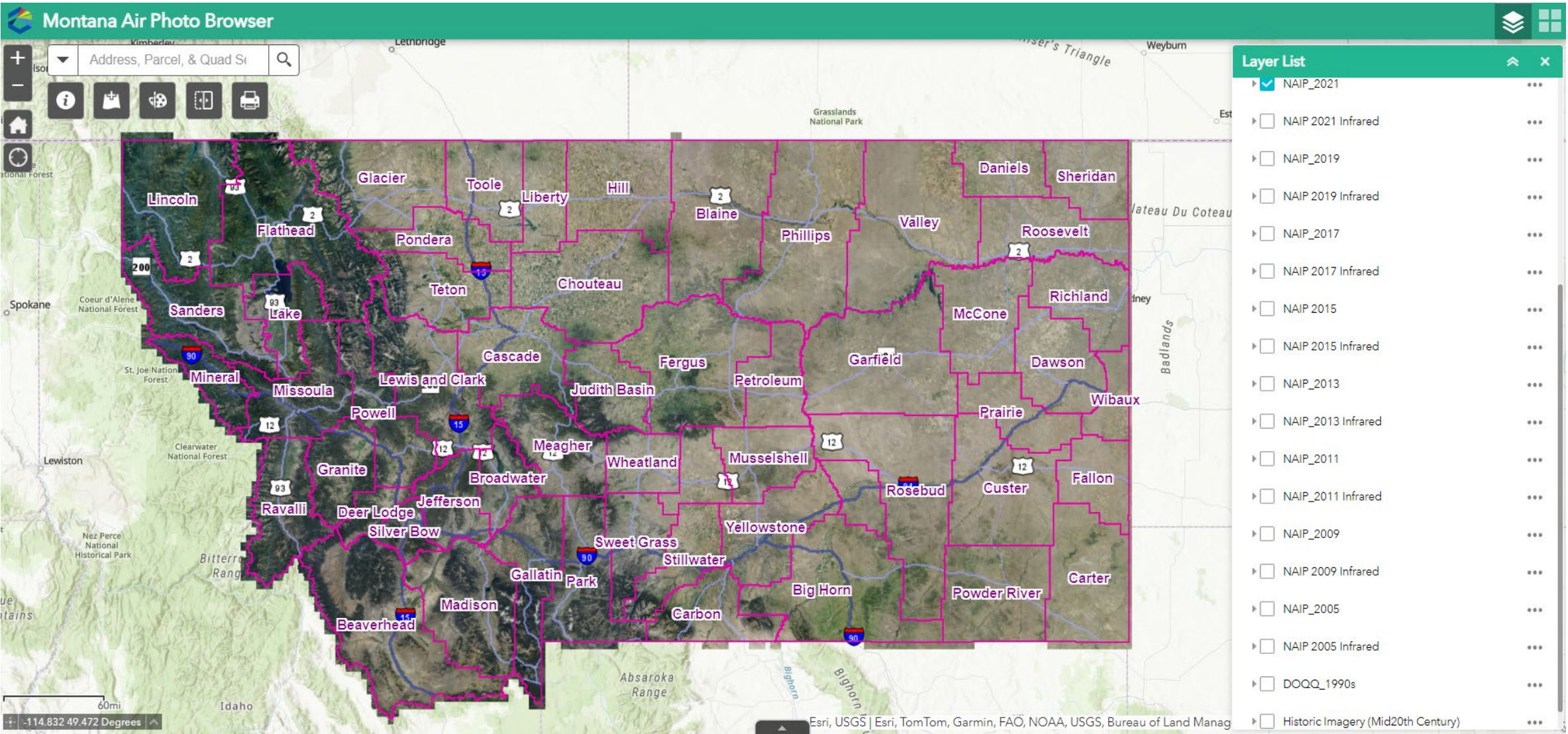


Desire for **technical sessions**, such as raster analysis and imagery management.

*Additional meetings held in February, March, April, and May...*

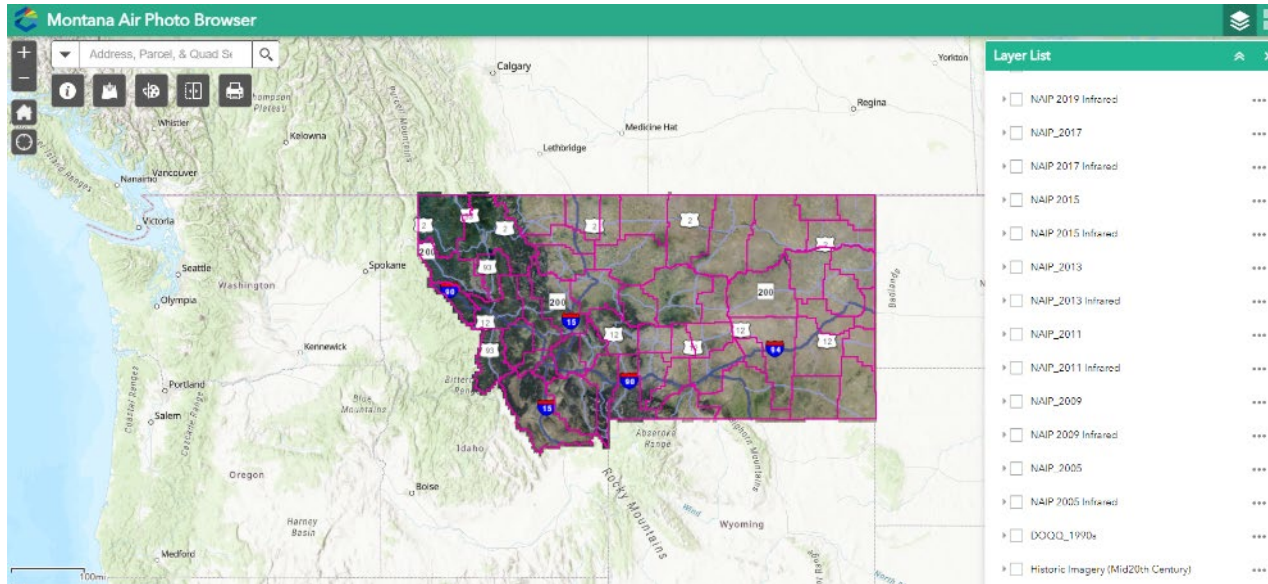
# Montana Spatial Data Infrastructure Imagery

Current state of imagery – primarily rely on NAIP



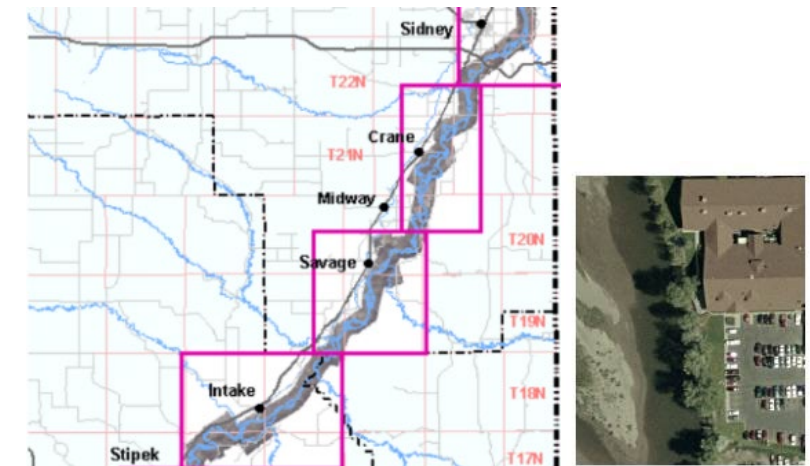


# Statewide collections



&

## Ad hoc imagery collections



Imagery is often collected for a specific program/project and remains with that program. The Imagery Working Group strives for broad imagery dissemination and use. The value of imagery increases with more use.

# Recap of Working Group Tasks to Date



# Initial Tasks

1. Charter and list of active participants and roles
  2. Assessment of imagery business use and critical activities (needs assessment)
  3. Inventory of existing imagery
  4. Planning and development of a business case for an imagery repository
- ❖ The documents above will become key sections of a **Montana Imagery Plan**

# Charter and Participants

**Purpose** - meets regularly to communicate, plan, and execute initiatives aimed at **improving efficiencies and standardizing procedures related to the collection, maintenance, and dissemination of imagery** within Montana.

**Authority** - The Working Group is authorized by the Montana Geographic Information Advisory Council (MGIAC) to ensure imagery meets the current and future needs of the participating agencies and allows for full participation and representation of those agencies.

**Meeting frequency** – Currently meeting approx. monthly through at least June 2025. May transition to quarterly.

**Resources** – volunteered time of its members

**Membership and Roles** – All meetings are open to anyone who has an interest. “Active” participants and “recipients.”

**Leadership Structure:** Chair, Erin Fashoway. Co-Chair, Troy Blandford. Authority - Advises the Montana Geographic Information Advisory Council (MGIAC)

# Participant Roles

- ❑ Writing and reviewing best practices or a Montana Imagery Plan
- ❑ Reporting or providing expert testimony to Council, Commission, MAGIP, Legislature, and other Stakeholders
- ❑ Testing technical imagery workflow
- ❑ Writing and developing policies or standards
- ❑ Represent your organization and imagery needs at stakeholder events
- ❑ Supply graphics for visualization of various image solutions

# Active Members

Organization	Writing and reviewing best practices or a Montana Imagery Plan	Reporting to Council, Commission, GIS Managers Forum, MAGIP, Legislature, and other Stakeholders	Testing technical workflow	Writing and developing policies or standards	Represent your organization at stakeholder events	Providing expert testimony (written or oral presentation) to support imagery efforts	Supply graphics for visualization of various image solutions
Montana State Library	✓	✓	✓	✓	✓	✓	
Montana State Library	✓	✓	✓	✓	✓	✓	
Montana State Library	✓		✓	✓	✓		
Dept. of Transportation	✓		✓	✓	✓	✓	
Dept. of Revenue	✓		✓		✓	✓	
DEQ	✓		✓	✓	✓		✓
Eagleview					✓		
Sanborn	✓			✓			
NV5	✓			✓		✓	✓
University of Montana	✓		✓	✓			✓
Hexagon	✓			✓	✓	✓	✓
ESRI			✓		✓	✓	✓
ESRI	✓	✓	✓		✓		
MGIAC/L&C County		✓			✓		✓
City of Kalispell			✓				✓
1Spatial					✓		
Madison County							
DNRC							
Montana State University							
MAGIP							
Bureau of Indian Affairs					✓		

- State agencies
- Federal agencies
- Counties
- University
- Cities
- GIS Professionals Organization
- Tribal
- Imagery vendors, consultants, ESRI

- Plus, an additional 12 to 20 people who join wg meetings to stay informed. Email list is about 60.

# Montana Spatial Data Infrastructure Imagery Working Group Hybrid Meeting

May 15, 2024, 9:00a.m. – 11:15a.m. (MDT)

(Previous meeting)

Learn from other states  
and imagery vendors.

## AGENDA

9:00 AM – 9:10 AM

**Welcome & Introductions**

9:10 AM – 9:25 AM

**Update on Working Group Tasks**

9:25 AM – 10:00 AM

**Washington Statewide Imagery Services Program &  
WA Commerce Aerial Imagery Study, 2023**

*Joanne Markert, State of Washington*

10:00 AM – 10:30 AM

**North Dakota Imagery Repository Efforts**

*Chris Bader, OffRoad Software Inc*

10:30 AM – 10:50 AM

**Statewide Imagery Programs: Pros & Cons of  
Conventional, COTs, & Hybrid Approaches**

*Justin Klinkenberg, Woolpert*

10:50 AM – 11:15 AM

**Information Sharing – All Working Group**

**Participants:** Recent, in-progress, or planned imagery  
collections in Montana.

**Discussion & Closing**

# Inventory of Existing Imagery

## **Who has what?** (State, Federal, Tribal, local and others)

**Inventory of where imagery currently resides and how it is requested/obtained.**

- *Organization, Primary Contact*
- *Description of imagery*
- *Geographic extent*
- *Publicly available? Yes, no*
- *Means of dissemination (self serve or by request)*
- *Storage size*
- *Feature class/shapefile of AOI or tile index available? Yes, no*
- *Would a central repository be preferred? Benefits to your agency?*



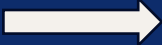
# Imagery Business Use and Critical Activities

- Imagery needs assessment survey
  - *Primary imagery use*
  - *Current needs met by MSDI imagery (NAIP) yes/no*
  - *Desired accuracy/resolution*
  - *Desired geographic area*
  - *Desired ground conditions, leaf-on or leaf-off and other considerations*
  - *Refresh cycle*
  - *Geographic area of interest (statewide, regional, local)*
  - *Potential benefits/cost savings of an imagery repository*
  - *Potential benefits/cost savings of an imagery program*

Functional Need	Statute & Rules	Relevance of imagery	Notable dates
Historic Use of Navigable Riverbeds	77-1-1112	"aerial photographs demonstrating the use to which the application for authorization applies"	Prior to October 1, 2011
Application for Easement	77-2-102	"aerial photographs or images by an agency of the United States government dated prior to October 1, 1997, that depict the county road"	prior to October 1, 1997

# Imagery Repository

## Business Case

<b>Current Status</b> 	<b>Desired Alternative</b>
Imagery collection is minimally coordinated, increasing the risk of duplication (cost and effort)	Imagery collections are coordinated through an Imagery Working Group, leading to shared resources and improved awareness of imagery efforts.
Challenging to know where to direct imagery requests. Must check multiple places. Other agencies spend time filling requests, which takes away from their programs and missions.	An imagery repository is maintained by MSL and the Imagery Working Group and includes standards and metadata. Imagery requests can be directed to a single place. There is a clear reference for citizens about where to get imagery.
Limited serving of imagery means limited use and value.	New imagery collections are published by the MSL, made publicly available, and broadly used, thereby, increasing value.

# Legislative Planning

## Key dates

- ~~April 17<sup>th</sup> - State Library Commission starts executive planning~~
- ~~April 30<sup>th</sup> - House Bill 10 requests (long-range information technology)~~
- June 6<sup>th</sup> - House Bill 2 requests (general state budget)

*-Revenue shortfalls*


*-Can another state agency be the champion? Can the Working Group be the impetus?*

*-Other funding opportunities? Develop funding/grant opportunities list*

# Future Meetings & Announcements

- Find working group meeting presentations, notes, and other information at:  
<https://msl.mt.gov/geoinfo/msdi/orthoimagery/>
- Stay informed about Imagery Working Group meetings and other happenings by subscribing to the Montana State Library through GovDelivery:  
<https://public.govdelivery.com/accounts/MTLIBRARY/subscriber/new>



An aerial photograph of a city, likely Missoula, Montana, showing a river winding through the urban area. The city is densely packed with buildings and streets, surrounded by agricultural fields and some forested areas. The river is a prominent feature, flowing from the top right towards the bottom left.

The Montana Imagery Working Group  
is open to anyone interested

Welcome to join future meetings!

Erin Fashoway  
State GIS Coordinator  
[tblandford@mt.gov](mailto:tblandford@mt.gov)

Troy Blandford  
Water Information Lead  
[tblandford@mt.gov](mailto:tblandford@mt.gov)

