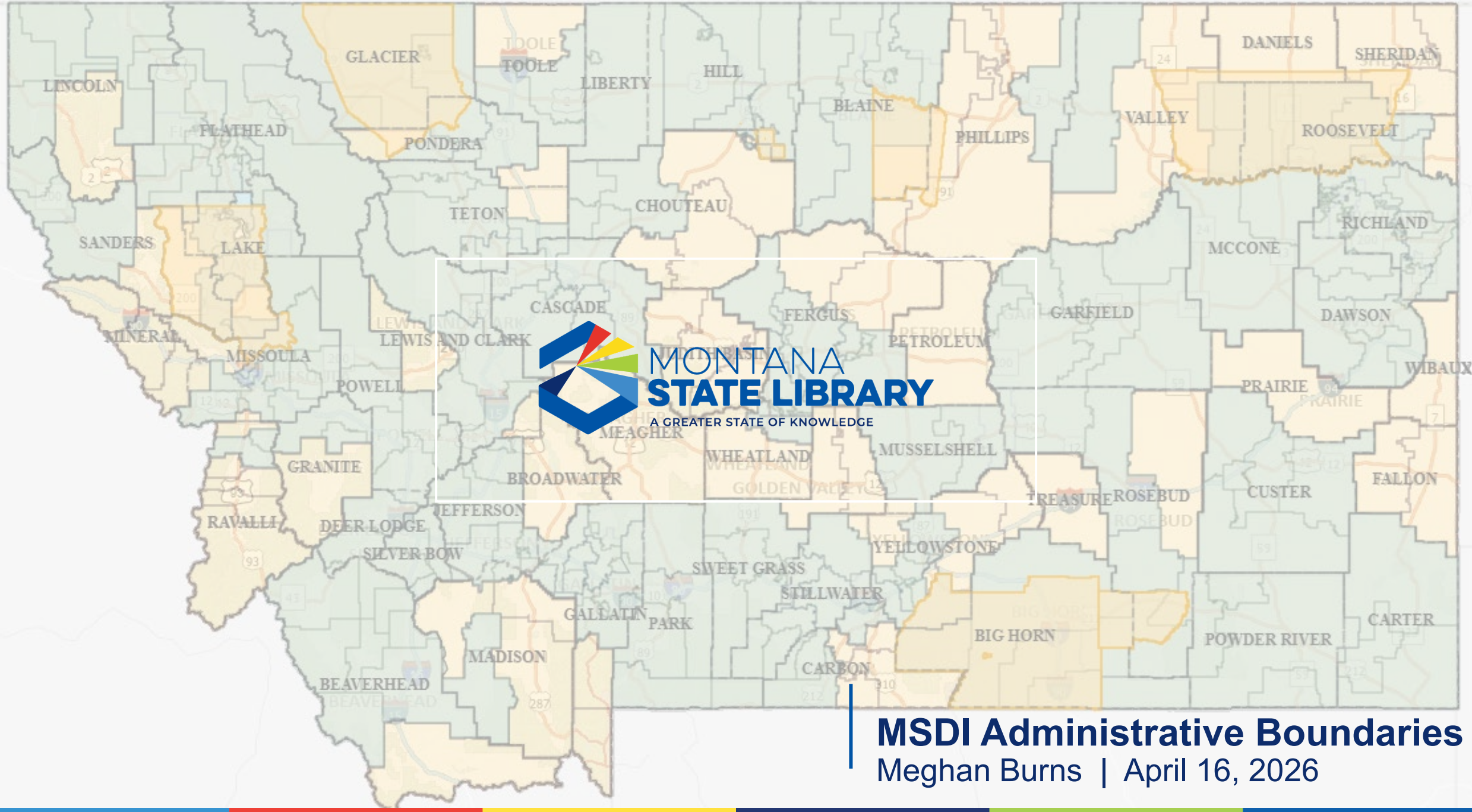


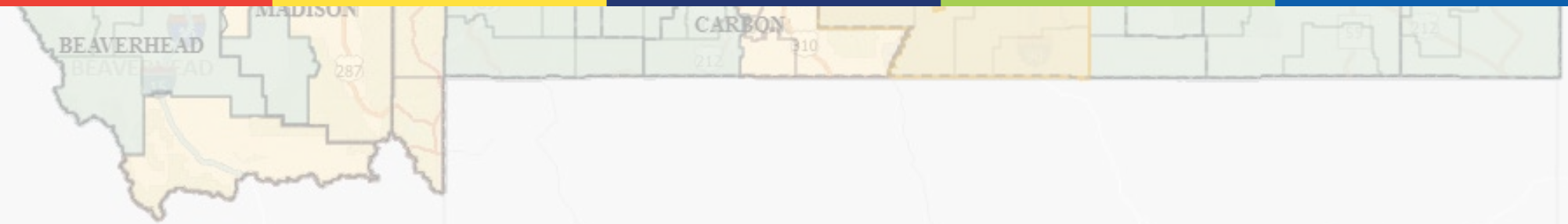
MSDI Administrative Boundaries

Meghan Burns | April 16, 2026

Meeting Agenda

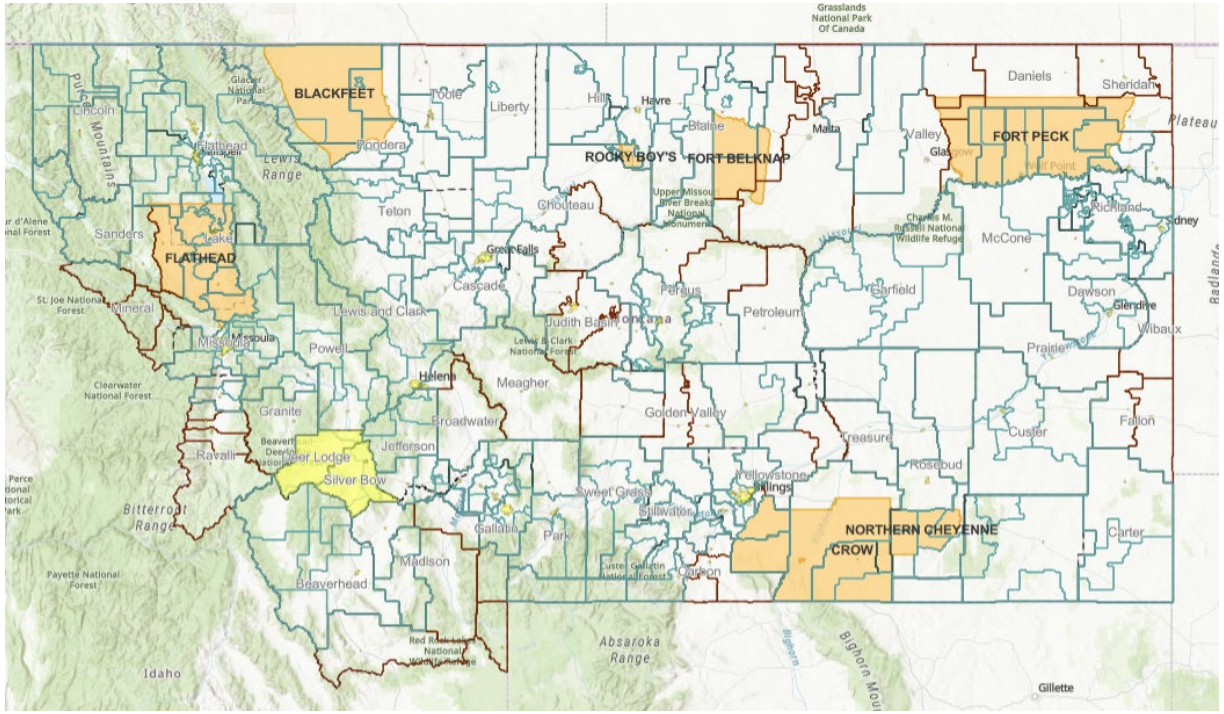
- Administrative Boundaries Framework Theme
  - Publishing, data sub-themes and data sources, related laws
- Assessing MSDI Framework Data Quality and Improvement
- Review Data Improvement Plan
  - Near-term Goals
  - Long-term (5-year) Goals
- Discussion
  - Survey Results
  - Questions
  - Feedback
- Closing
  - Next steps
  - Future meetings

MSDI Administrative Boundary Theme Updates



Administrative Boundaries Theme Updates

- The number of sub-themes has grown from 18 to 43
- Election Districts are used for state/county/city elections
- Data come from federal, state, and local partners
- MSL provides data updates to: Census, USGS PAD-US, Esri
- MSL publishes datasets in various formats, maps, and apps



Administrative Boundaries Sub-Themes: Core

- State
- Tribal Nations Reservations & Off Reservation Trust Land
- Congressional Districts (LEG)
- Legislative Districts (House and Senate Districts)
- Voting Precincts
- County
- County Commissioner Districts
- Incorporated Cities and Towns
- School Districts (Elementary, High School, K-12)
- Rural Fire Districts (DNRC)
- Soil Conservation Districts (DNRC)
- Tax Increment Financing Districts (DOR)
- Weed Management Districts
- Managed Areas

Administrative Boundaries Sub-Themes: US Census Bureau Data

- State*
- Tribal Nations Reservations*
- Congressional Districts*
- Legislative Districts (House and Senate Districts)*
- Voting Precincts*
- County*
- Incorporated Cities and Towns*
- School Districts (Elementary, High School, K-12)*

Non-MSDI include:

- Census Tracts
- Census Block Groups
- Census Blocks
- County Subdivisions
- Public Use Microdata Areas (PUMAs)
- Census Designated Places (CDPs)

*** Indicates sub-theme is also a Core Sub-Theme**

Administrative Boundaries Sub-Themes: Election Districts

- Ambulance/EMS
- Cemetery
- City*
- Community Council
- Congressional*
- County Commissioner*
- County*
- Fire*
- House District*
- Irrigation
- Judicial
- Jury
- Library
- Mosquito
- Park and Recreation
- Public Hospital
- Public Service Commission
- Resort
- Rural
- Rural Improvement
- School*
- School Single Member Trustee
- Senate District*
- Sewer
- Soil Conservation*
- Special
- State*
- Study Commission
- Supreme Court Justice
- Transportation
- Voting Precinct*
- Ward
- Water

*** Indicates sub-theme is also a Core Sub-Theme**

Public Boundary Data Layer Updates March 2026

- Election Districts and Precinct Splits are current as of Date (for the May Elections)
  - Available to download from the MSDI Boundary Page or the FTP:
    - ✓ Statewide and by County
    - ✓ Format:
      - File Geodatabases
      - Shapefiles
      - Web Services
    - ✓ And Current Precinct Splits Excel Table

- Visit the MSDI Boundary page for: https://msl.mt.gov/GIS/Boundaries
  - Metadata Records (links to MSL GIS Data List Application)
  - Data Download Links (File Geodatabase and Shapefile)
  - Web Services: https://gisservicemt.gov/arcgis/rest/services/MSDI_Framework/Boundaries/MapServer
  - Map/App Gallery: https://montana.maps.arcgis.com/apps/instant/filtergallery/index.html?appid=02748f7435284288bc4e0a656a634a6c
  - Geo-Enabled Elections Hub: https://geoenabled-elections-montana.hub.arcgis.com/
  - FTP Link: https://ftpgeoinfo.msl.mt.gov/Data/Spatial/MSDI/AdministrativeBoundaries/Elections/

Boundary Calendar

January

- **Receive US Census Bureau Boundary Annexation Survey (BAS) materials**
- Check and update School County Superintendents list
- *Newly elected legislators take office; Candidate filing*

February

- BAS non-response follow-up by MSL and Montana Department of Commerce Census and Economic Information Center (CEIC)
- BAS State Certification by MSL due
- Local Governments must submit formal notification for the creation or amendment of a TIFD to DOR on or before **February 1**

March

- **BAS due March 1**: Boundary updates returned by this date will be reflected in the American Community Survey and Population Estimates Program data, and in next year's BAS materials.
- Update City boundaries and Annexations table from US Census Bureau
- Request new TIFDs list from Montana Department of Revenue and update TIFDs

April

- Review Weed District Contacts
- Review National Park Boundaries
- Review Tribal Nation Reservation Boundaries
- US Census Bureau School District Review Program Verification for Previous Year

May

- **Final BAS submittal May 31**: Boundary updates returned by this date will be reflected in next year's BAS materials.
- ***Special District Elections (e.g. School Districts)***

June

- ***Election Primary (Even Years)***

July-September

- Adjust boundaries to new CadNSDI (if there is an update)
- US Census Bureau School District Review Program (SDRP) Coordinator is appointed for the State: The Boundary Theme Steward has been performing this role in Montana
- Obtain updates from the Office of Public Instruction (OPI): make School District boundary changes, update the School Enrollment table, and check Grade and LE changes

October

- Request School District boundary changes from County Superintendents/County GIS
- Check OPI Schools List for grade and LE changes

November

- ***General Election (Even Years) | Municipal General (Odd Years)***

December

- US Census Bureau School District Review Program updates are due December 31 (SDRP Coordinator submits updates on the county's behalf)
- Obtain Census BAS Annexations submitted this year

https://geoenabled-elections-montana.hub.arcgis.com/pages/boundaries

Election Calendar

Month	Even Years	Odd Years
January	Candidate Filing / Boundary & Address Updates	Candidate Filing / Boundary & Address Updates
February		
March	Primary Ballot Certification	
April	Special District Ballots / Ballots to UOCAVA for General Election	Special Districts Ballots
May	Special District Elections	Special District Elections
June	Primary	
July	Boundary Updates	Boundary Updates
August	Ballot Certification	Municipal Primary Ballots
September	UOCAVA Ballots	Municipal Primary
October		Municipal General Ballots
November	General Election	Municipal General
December		

May – Special Elections (e.g. School)
September – Municipal Primary
November – Municipal General

Indicates when the Montana Secretary of State (SOS) can update the Election Management System (EMS) with GIS Data Layers from the Montana State Library (MSL)

Boundary Related Laws

- The Montana Code Annotated (LEG)
- Administrative Rules of Montana (SOS)
- List on the Geo-Enabled Elections Hub Boundaries page:

https://geoenabled-elections-montana.hub.arcgis.com/pages/boundaries

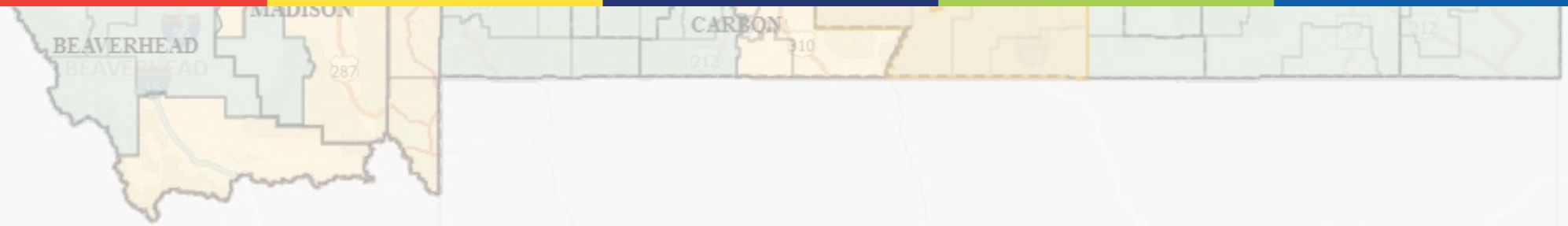
BAS Agreements - Types

- State Agreements: available to states; two types:
  - State reports boundary changes for all incorporated places
  - State provides the Census Bureau with a list of local governments that reported boundary changes to the state. Census Bureau
  - Available to states that:
    - Enforce law requiring local gov’ts to report to state agency (no longer a requirement) OR
    - have a signed MOU (new!)

- Consolidated BAS Agreements (CBAS): available to county governments interested in submitting boundary changes for the legal governments within their jurisdiction (incorporated places)

https://www.census.gov/programs-surveys/bas/information/agreements.html
2026 Boundary and Annexation Survey (BAS) Viewer

Introduction to Assessing MSDI Framework Data Quality and Improvement



Overview of Assessing MSDI Framework Data

- MSL's *GIS Coordination Strategic Plan (FY2023-2027)*
  - Prioritized four Business Plans
- Goal 4: Business Plan to Improve Geospatial Data Value
  - "Improve the collection, maintenance, and dissemination of authoritative geospatial information, aiding the creation of better policies, more informed decisions, and providing value to Montana."
  - Objective 3:
    - "Assess datasets and data themes using the data quality measures"
  - Objective 4:
    - "Determine actions needed to improve the value of the selected datasets and data themes"
  - Objective 5:
    - "Generalize the findings in Objective 4 to a program of data quality improvement"

Assessing MSDI Framework Data Quality
Data quality measures

- **Timeliness**: an assessment of the data's update cycles, and temporality to internal and external deadlines and reporting needs
  - **Update Frequency**: an aspect of "Timeliness", specified in this assessment because it is usually an explicit part of data management workflows
  - **Archive Frequency**: an aspect of "Timeliness", specified in this assessment because it is usually an explicit part of data management workflows
- **Accuracy/Precision**: a measure of the spatial accuracy of the data. Is the accuracy stated? Does is match end user's needs?
- **Consistency**: a measure of the similarities and differences between data stored in multiple datasets or databases
- **Completeness**: a measure of how comprehensive the information in a dataset is. Are required or priority fields populated?
- **Integrity**: as assessment of whether the data's structure, schema and maintenance workflows meet end users needs
- **Relevance**: an assessment of the accessibility and availability of the data required to inform business systems and answer business questions

For each measure, consider *current practices, short-term needs, and long-term needs.*

Data Quality and Improvement Process

Objective 1

Define MSDI Datasets & Data Themes

Objective 2

Define measures of Geospatial Data Value for those Datasets/Themes

Objective 3

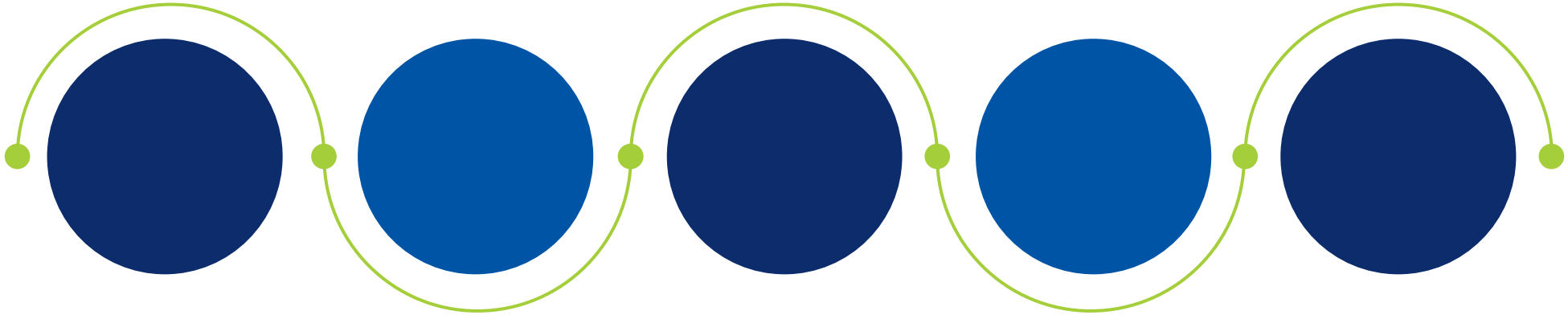
Assess Datasets/Themes using Data Quality Measures (matrix)

Objective 4

Determine Actions needed to improve the value of selected Datasets/Themes (plan)

Objective 5

Generalize the findings in Objective 4 to a Program of Quality Improvement



Data Quality and Improvement Process

Objective 1: Define Datasets and Data Themes

Montana Spatial Data Infrastructure

- **Administrative Boundaries**
- Cadastral
- Climate
- Elevation
- Geographic Names
- Geology
- Hydrology
- Hydrologic Units
- Land Cover
- Mapping Control
- Imagery
- Soils
- Structures & Addresses
- Transportation
- Wetlands & Riparian

Data Quality and Improvement Process

Objective 2: Define Measures of Geospatial Data Value for Datasets & Data Themes

- **Timeliness**: an assessment of the data's update cycles, and temporality to internal and external deadlines and reporting needs
  - **Update Frequency**: an aspect of "Timeliness", specified in this assessment because it is usually an explicit part of data management workflows
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- **Relevance**: an assessment of the accessibility and availability of the data required to inform business systems and answer business questions

For each measure, consider *current practices, short-term needs, and long-term needs.*

Data Quality and Improvement Process

Objective 3: Assess Datasets/Themes using Data Quality Measures (Matrix)

- Uses the data quality dimensions to assess the data themes
- Create worksheet (matrix) for each theme / sub-theme
- Data Themes/Sub-Themes are listed in Rows
- Data Quality Dimensions are listed in Columns

Data Quality and Improvement Process

Objective 4: Determine actions needed to improve value of Datasets & Themes (Plan)

- Actions needed to address deficiencies and make improvements
- Actions will differ by dataset & data theme
- Technical means and Tools that will be used
- Common Technical Means:
  - Performing consistent data profiling to determine missing values, outliners, etc.
  - Implementing proactive data validation during entry and editing workflows
  - Using plan that specifies who, when, and how datasets are updated
  - Establishing and enforcing standards (domains, constraints, naming conventions, etc.
  - Promulgating standards and educating data creators/maintainers to build culture

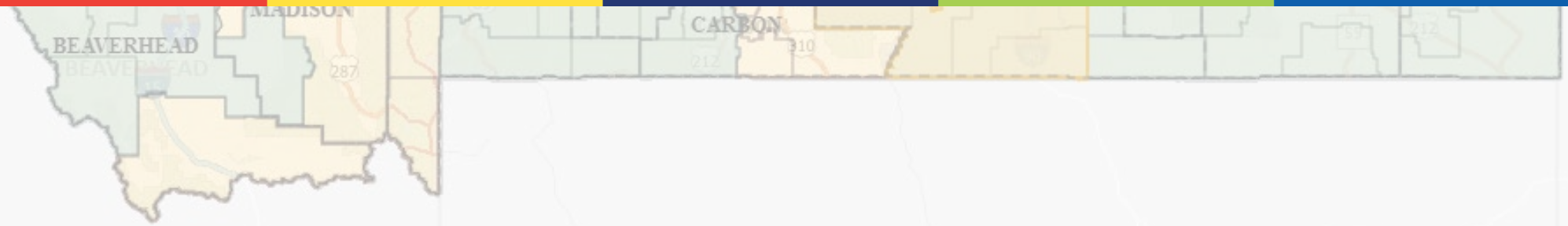
Data Quality and Improvement Process

Objective 5: Generalize the findings in Objective 4 to a Program of Data Quality Improvement

- 1 – Assign priorities to the data themes
- 2 – Convene a data theme working group
- 3 – Sent a recurring schedule of meetings
- 4 – Set schedule of data quality check-ins once plan is developed
- 5 – Define datasets included in the data themes to include in assessment
- 6 – Identify and document data owners, maintainers, consumers for selected dataset and data themes

Objective 3:
Review MSDI Admin Boundary Data Quality Assessment Matrix

Working Group Meeting: June 18, 2025



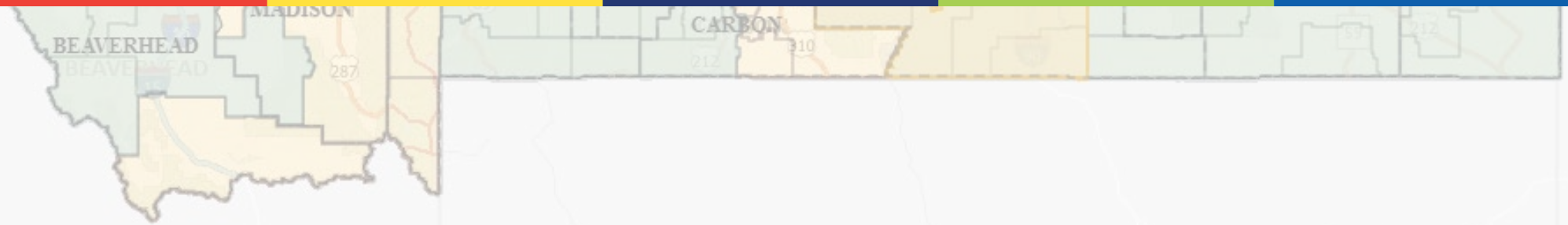
Data Quality Assessment Matrix Summary

- **Spatial Accuracy and Precision**
  - Accuracy – majority mapped to MSDI layers: parcels, CadNSDI, transportation; some mapped to Census data; other sources
  - Precision – varies across the state; dependent on other datasets
- **Completeness**
  - Statewide coverage
  - Validate with other state data?
  - Schema meeting business needs?
- **Consistency**
  - Adjustment to latest CadNSDI in progress; boundaries mapped to parcels / CadNSDI published at the time of edits
  - Various data sources; Election Districts schemas are consistent across datasets
  - Topology errors exist within and between datasets
- **Update Frequency**
  - Updates vary; dependent on elections and workload
  - Attempt to publish at least annually; if not more frequently
- **Integrity / Business Relevance**
  - Many are in statute (MCA) or rule (ARM) define what, when, and who is responsible
  - Boundaries and attributes may not be current
  - Would value feedback on how we could better meet your business needs
- **Archive Frequency**
  - Annual snapshots are available via FTP site
  - Scheduled Backups of SDE
  - Backups / snapshots of web service updates

Next Steps

- Sent out matrix for review and feedback
- Incorporate feedback into the final Data Quality Matrix Worksheet
- Recorded presentation for the September 25, 2025, MGIA Council Meeting
- Develop Data Improvement Plan
- Hosted Working Group meeting to review plan: March 17, 2026

Review MSDI Admin Boundary Data Improvement Plan



Near-Term Goals

1) Identify topology errors
2) Improve update frequency
3) Review and update publishing process for efficiency and consistency
4) Increase cadence of working groups meetings
5) Identify incomplete datasets
6) Inventory current data, map, web map and application products
7) Review items for redundancy, ADA accessibility, and consistency of look and feel including brand recognition
8) Review and create documentation for all business processes and publications for both internal use and external access
9) Review data schema
10) Validate metadata
11) Complete Data Improvement Plan
12) Review outreach

Five-Year Goals

1) Identify and prioritize areas that need adjustment and additional survey control
2) Streamline adjustment process: coordinate with the Cadastral Framework Theme Lead to make adjustments as soon as they are published
3) Work with the US Census Bureau to align Census geographies to the MSDI Framework Datasets and resolve discrepancies
4) Develop and implement at MOU (State BAS Agreement) between the US Census Bureau and the State (MSL?) to submit BAS updates to the Census Bureau on behalf of any counties that sign an agreement with the MSL
5) Collaborate with neighboring states to improve state boundary
6) Streamline process for reviewing and updating the Managed Areas Database and submitting updates to the USGS
7) Create time-enabled Annexation feature class to provide timeline of boundary changes and resolution numbers
8) Create a searchable / publicly accessible repository for all the resolutions, ordinances, and legal documentation received from the counties
9) Consider time-enabled subthemes or track changes to show change over time
10) Implement new schema. Document data schema and standard. Comply with metadata standards
11) Implement methods to reduce topology errors
12) Implement versioned editing and train additional staff to update datasets
13) Evaluate, Implement, and Reevaluate Data Improvement Plan annually
14) Hold annual working group meeting (or as needed) and present annual update at Big Sky GeoCon
15) Develop outreach plan

Assessing MSDI Framework Data Quality
Data quality measures

- **Timeliness**: an assessment of the data's update cycles, and temporality to internal and external deadlines and reporting needs
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- **Relevance**: an assessment of the accessibility and availability of the data required to inform business systems and answer business questions

For each measure, consider *current practices, short-term needs, and long-term needs.*

Data Quality Improvement Plan Summary

- **Spatial Accuracy and Precision**
  - Current: varies across the state, mapped to various sources, CadNSDI improvement, Census Geography differs from MSDI geography
  - Near-Term: identify areas where Census Data does not align with MSDI
  - Long-Term: Census Boundary Improvement Project
- **Completeness**
  - Current: statewide coverage, on-going maintenance, errors of omission/commission
  - Near-Term: validate against data sources
  - Long-Term: statewide dataset with no discrepancies, updated monthly
- **Consistency**
  - Current: adjusted to current CadNSDI, data from various sources, do not have all documentation or line features with data sources attributed, topology errors exist
  - Near-Term: topology checks implemented, aligned with current geometry, documented, data schema reviewed, metadata validated
  - Long-Term: no topology errors, alignment issues resolved, Census data updated and aligned with MSDI
- **Update Frequency**
  - Current: annual publication at minimum
  - Near-Term: publish monthly (if there are updates)
  - Long-Term: publish monthly or more frequently if there are updates or a correction
- **Integrity / Business Relevance**
  - Current: topology errors, attribution errors, errors of omission and commission
  - Near-Term: attributes and topology are validated
  - Long-Term: boundary validated by data owners, errors corrected
- **Archive Frequency**
  - Current: annual snapshot
  - Near-Term: archive monthly
  - Long-Term: monthly archive available to public

Data Quality Improvement Plan Summary

- Data Theme has 3 categories
  - Administrative Boundaries
  - Census Data
  - Managed Areas

- Feasibility and Comments
  - Call out individual sub-themes if they differ from the group
  - Provide examples of remediation strategies

Data Quality Improvement Plan Example

Data Theme	Measure	Outcome	Action	Ongoing Action (Y/N)	Progress Assessment (Date)	LOE (staff time)	LOE/Cost External Support	Infrastructure Cost	Feasibility and Comments
Theme/ Sub-theme or Dataset	Update Frequency	<Describe desired outcome, headed by time frame: “Current”; “Near-term”; “Long-term”>	<Actions needed to achieve outcome>	<Is the action underway (Y/N)> Now? Or Future?	<Date and progress toward outcome; may be updated> Last time reviewed; In progress, ongoing, complete (date of completion); Last time published; Percent of Progress; Are there issues maintaining the current status? Do we have the resources?	<Can the action be accomplished at current staffing (y/n)? Provide an estimate of hours> Rough estimate of hours (% of staff time)	<Is external support needed (y/n)? Provide an estimate of hours or cost> External to MSL; Contract for services? Additional software, staff, service needs; Over and aboved expected	<Is the necessary infrastructure in place (y/n). Provide an estimate of cost.>	<Note that future ideas, currently infeasible, can be listed> Document any gaps or limitations to completing the work (feasibility and comments)
Administrative Boundaries	Update Frequency	Current: Minimum Annual Publication	In place	Y - (Esri, FTP, web, data list)	Last published 12/2025; cities 3/4/2026	Y - 50% 1 person	N	Y - Esri, FTP, website, Hub	
Administrative Boundaries	Update Frequency	Near-term: Publish Monthly (if any updates)	Implement in ROK environment including updated publishing scripts	Y - (meeting with ROK); if ROK falls through - can meet with current environment		N (Yes with 100% 1 person or 50% each 2 people)	Y - ROK	Y - ROK, website, Hub	Verisioned editing / train additional staff to edit
Administrative Boundaries	Update Frequency	Long-term: Publish Monthly or more frequently if there is a correction or big update	Implement in ROK environment including updated publishing scripts	Y - (meeting with ROK); if ROK falls through - can meet with current environment		N (Yes with 100% 1 person or 50% each 2 people)	Y - ROK	Y - ROK, website, Hub	Versioned editing / train additional staff to edit
Administrative Boundaries	Archive Frequency	Current: Annual Snapshot	In Place (FTP, GIS Archive)	Y - (FTP, GIS Archive)	Last archived 1/2026	Y	Y - Esri, FTP, website	Y - Esri, FTP, website, Hub	
Administrative Boundaries	Archive Frequency	Near-term: Archive Monthly	Implement in ROK environment; Storage space requirements	Y - (meeting with ROK)	Y - with scripting	Y	Y - ROK, Esri	Y - ROK, storage space	
Administrative Boundaries	Archive Frequency	Long-term: Make each archive available to the public	Implement in ROK environment, AGOL; Storage space requirements	Y - (meeting with ROK)	Y - with scripting	Y	Y - ROK, Esri	Y - ROK, Esri, FTP, website, Hub, storage space	Consider time-enabled services or show / track changes

Data Quality Matrix

Election Districts

- **Spatial Accuracy and Precision**
  - Accuracy – most mapped to MSDI layers: parcels, CadNSDI, transportation; some mapped to Census data
  - Precision – varies across the state; depends on source datasets
  - Adjustment to 2025 CadNSDI in progress; boundaries mapped to parcels / CadNSDI published at the time of edits
- **Completeness**
  - Statewide coverage
  - Validate with other statewide data – DOR, DNRC
- **Consistency**
  - Schema consistent across election districts
  - various data sources (map, resolution, GIS)
  - Topology errors exist within and between datasets
- **Integrity / Business Relevance**
  - Many are in statute (MCA) or rule (ARM); dictate when, how, and who is responsible
  - Elections (SOS)
- **Update Frequency**
  - Dependent on elections
  - Currently publishing at least twice a year around election time; would ideally update monthly or when there is an update


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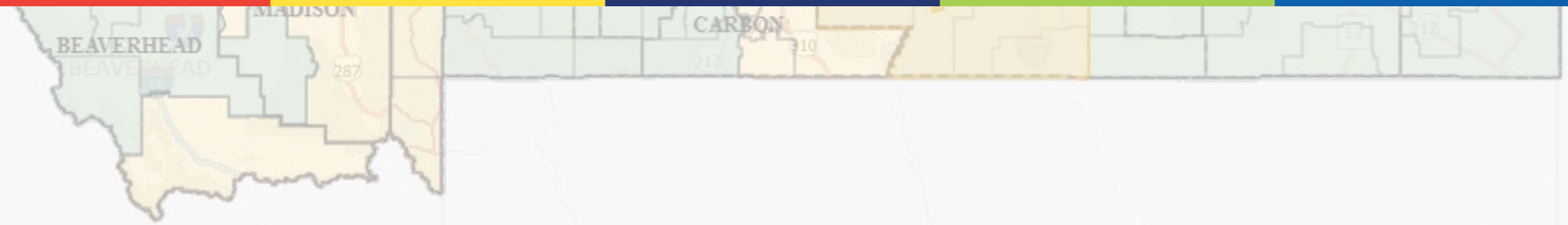
Discussion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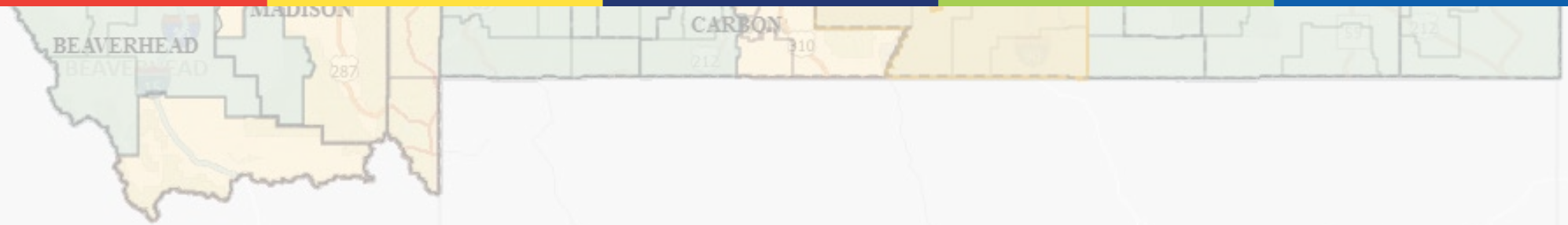
Discussion

- Feedback: What is working & What could be improved?
- Questions, Suggestions, Comments
    - Does anything keep you from using the MSDI Boundaries?
    - What could make them more valuable/relevant to your work?
    - What limitations have you found?
- Survey Results (see separate pdf)

Survey Results

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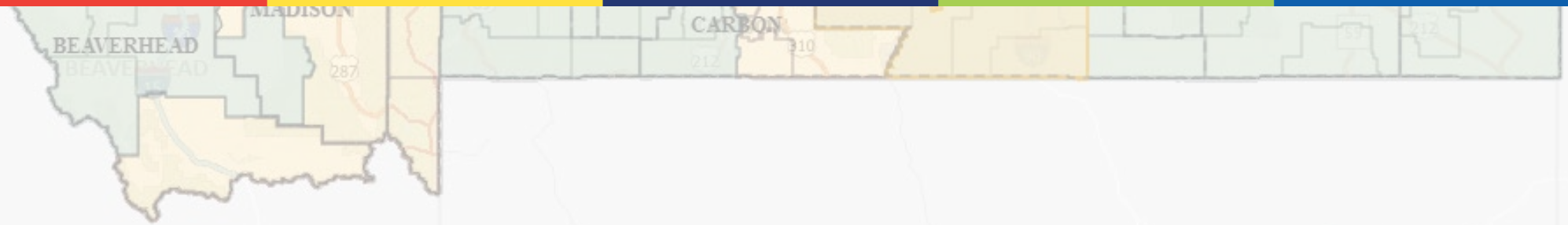
Next Steps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CARBON

Next Steps

- Present at the MAGIP Big Sky GeoCon – April 16
- Sent out plan for review and feedback – Accepting feedback through April 30
- Incorporate feedback into the final Data Improvement Plan
- Present to the MGIA Council
- Schedule next Working Group meeting to review draft Theme Plan

Theme Plan Template

Theme Plan Template

1. Theme Plan Template
    a. TOC
    b. Exec Summary
    c. Theme Definition & Description
        - List out all theme sublayers
    d. Individual Theme Testimonials sound bites (half page – 300 words)
        - Ask for 2-3 well written examples
        - Should not be written by the MSL
        - Use your working groups here and higher ups… exec, etc.
    e. The Plan (3-5 years)
        - Update Frequency
        - Archive Frequency
        - Spatial Accuracy & Precision
        - Consistency
        - Completeness
        - Timeliness
        - Integrity
        - Relevance
        - In the Parking Lot
    f. High Level Schedule
    g. Theme Challenges
    h. Conclusion
    i. Appendix
        - Matrix
        - Data Improvement Plan Table

Thank you for attending!

Please contact me:
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MSDI Administrative Boundaries Theme Lead
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office: (406) 444-1550

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A GREATER STATE OF KNOWLEDGE

https://msl.mt.gov/GIS/Boundaries

Subscribe to MSL News through GovDelivery for future meeting dates and other announcements:
https://public.govdelivery.com/accounts/MTLIBRARY/subscriber/new