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MSDI Administrative Boundaries Working Group

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Meeting Agenda

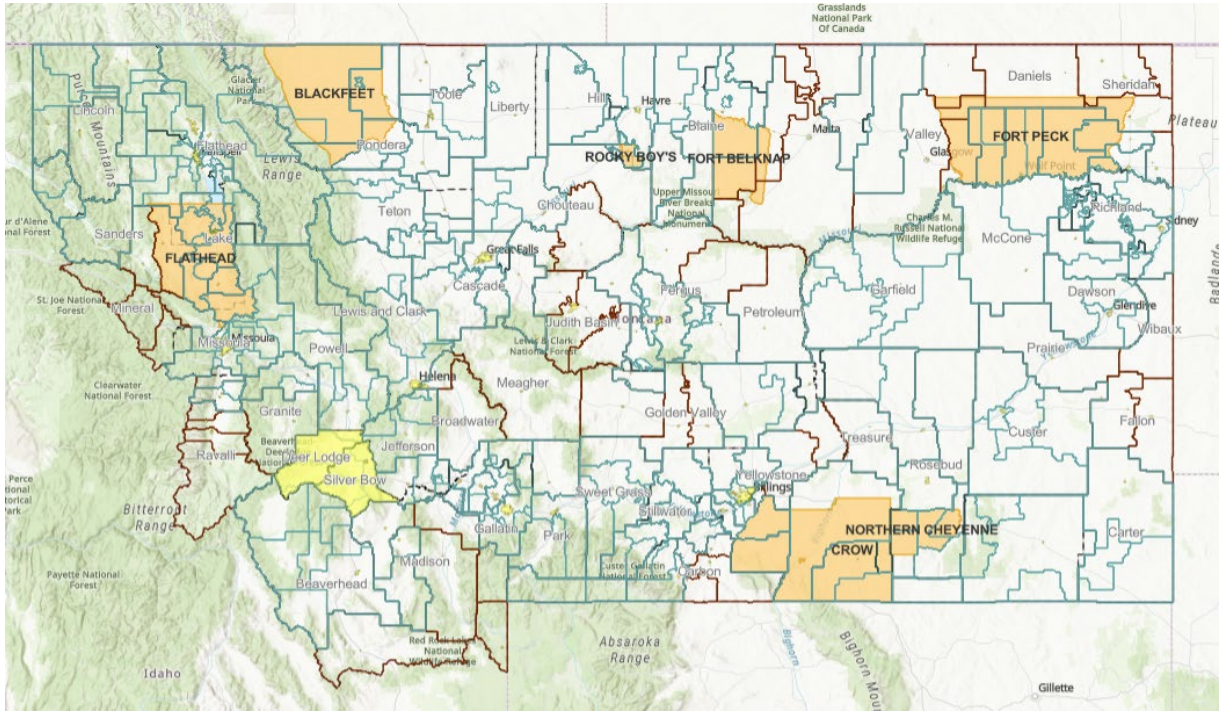
- Welcome & Introductions
- Administrative Boundaries Theme Updates
- Assessing MSDI Framework Data Quality and Improvement
- Review Data Quality Assessment Matrix
- Discussion
  - Q&A, Feedback
- Closing
  - Next steps
  - Future meetings

Introductions

- Name
- Organization
- You first, last, or most memorable concert

Administrative Boundaries Theme Updates

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



Administrative Boundaries Sub-Themes

- State*
- Congressional Districts*
- Legislative Districts (House and Senate)*
- Voting Precincts*
- Precinct Splits*
- County*
- County Commissioner Districts*
- Incorporated Cities/Towns*
- Rural Fire Districts*
- School Districts (Elementary, High School, K-12)*
- Soil Conservation*
- Tax Increment Financing Districts
- Tribal Nations Reservations / Off Reservation Trust Land
- Weed Management Districts
- Managed Areas
- National Park Boundaries

***Also an election district**

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

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.*

Administrative Boundaries Data Theme Quality Assessment Matrix

Data Theme (italic) and dataset	Data Value and Quality Goals									
	Update Frequency	Archive Frequency	Spatial Accuracy	Precision	Consistency	Completeness	Integrity	Timeliness	Business Relevance	Notes
Administrative Boundaries										
Definition: The administrative boundaries framework theme is compromised of core layers and election district layers										Currently provide each sub-theme in the following formats: file gdb, shp, web service
Core: State, Congressional, Legislative Districts, Voting Precincts, Reservations, County, Incorporated Places, School Districts, Tax Increment Financing Districts, Soil Conservation Districts (DNRC), Rural Fire Districts (DNRC), Weed Management Districts, Managed Areas, and National Parks										Maintain MSDI theme page; web and static maps and application
Election Districts: Precinct Splits, EMS, Cemetery, City, Community Council, Congressional, County Commissioner, County, Fire, House, Irrigation, Judicial, Jury, Library, Mosquito, Park and Recreation, Hospital, Public Service Commission, Resort, Rural, Rual Improvement, School, School Single Member Trustee, Senate, Sewer, Soil Conservation, Special, State, Study Commission, Supreme Court Justice, Transportation, Voting Precinct, Ward, and Water										Working to take advantages of Hub Data catalog to provide additional options for download; Publish as hosted feature service
Election Districts - Current Practices Evaluating the spatial geometry and attributes	Most are updated as needed providing updates from the Election Administrators; Congressional and Legislative are updated following the Federal or State timeline; They are usually published at least twice a year around election time (May/ Nov); Also consider CadNSDI adjustments	Annual Snapshot	Varies across the state; Most are mapped to MSDI parcels, CadNSDI, transportation; Several are mapped to Census Data (Congressional and Legislative)	Varies across state (+/- 160 meters to +/- 0.1 meter)	1.) Adjustment to CadNSDI in progress 2.) Original data from various sources; do not have all sources, annexations, resolutions, documentation, etc. 3.) Have not created line features for each with source attribution 4.) Topology errors	Statewide coverage with on-going maintenance	As good as possible based on knowledge / documentation of the county Election Administrator; Quality Control measures in place	Approx twice per year or more as needed	Elections; Local Governments; DOR/taxes	Soil Conservation Districts and Rural Fire Districts also maintained by DNRC; Work with CDs and Local Governments and Fire Districts directly for election purposes; Send updates to DNRC, Resort Districts maintained by MT DOC
Election Districts - Near-term Needs	Publish monthly	Archive each version	1.) Identify areas in state most in need of adjustment 2.) Prioritize any available funding/resources to adjusting/fixing these areas	improved precision based on adjustments/fixes (see Spatial Accuracy)	Implement topology checks and alignment with CadNSDI	Statewide coverage; Validation with DOR	Implement topology checks and alignment with CadNSDI	Monthly	Elections; Local Governments; DOR/taxes; Census	
Election Districts - Long-term Needs	Publish in near real-time as datasets are updated	Each version made available to public	Accurate to +/- 1 meter, statewide	Precision to +/- 1 meter, statewide	Fix topology errors and alignment issues; Work to improve Census Bureau base data	Statewide coverage; Validation with DOR	no topology, alignment, or attribution errors	Near real-time as changes are made	Elections; Local Governments; DOR/taxes; Census	Consideration for maintaining within Parcel Fabric

Data Quality 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

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

Data Quality Matrix

Congressional and Legislative Districts

- **Spatial Accuracy and Precision**
  - Accuracy –mapped to Census data
  - Precision – feature updates are snapped to Census boundaries within 30 feet
  - Continue to work to improve Census Data; alignment with MSDI
- **Completeness**
  - Statewide coverage
- **Consistency**
  - Persistent topology – geography built on common vertices/features
- **Integrity / Business Relevance**
  - Elections / Representation
- **Update Frequency**
  - Updated following decennial census (every 10 years)
  - Published every 10 years
  - Submitted to Census Bureau

Data Quality Matrix

Voting Precincts

- **Spatial Accuracy and Precision**
  - Accuracy –mapped to MSDI and Census data (nest within legislative districts)
  - Precision – various across state; depends on source
  - Continue to work to improve Census Data; alignment with MSDI
- **Completeness**
  - Statewide coverage
  - May be missing annexations, etc.
- **Consistency**
  - Persistent topology – geography built on common vertices/features
- **Integrity / Business Relevance**
  - Elections
- **Update Frequency**
  - Updated following decennial census (every 10 years) and whenever there is a county resolution (city annexation)
  - Submitted to Census Bureau
  - Currently publishing at least twice a year around election time; would ideally update monthly or when there is an update
  - MCA requirements of when and how they can be updated

Data Quality Matrix

County Commissioner Districts

- **Spatial Accuracy and Precision**
  - Accuracy –mapped to MSDI and Census data
  - Precision – various across state; depends on source
  - Continue to work to improve Census Data; alignment with MSDI
- **Completeness**
  - Nearly Statewide coverage – missing Treasure County
- **Consistency**
  - Schema same as other Election Districts;
  - Not all counties have their commissioner districts assigned within the election system
- **Integrity / Business Relevance**
  - Elections
- **Update Frequency**
  - Review following decennial census (every 10 years) and whenever there is a county resolution (city annexation)
  - MCA requirements of when and how they can be updated
  - Published as needed when there is an update

Data Quality Matrix

County Boundaries (and Weed Districts)

- **Spatial Accuracy and Precision**
  - Accuracy – mostly mapped to MSDI layers: parcels, CadNSDI; river boundaries held at 1972 location
  - 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
  - Schema includes state and federal codes
  - Weed Districts – same boundaries; schema includes contact information (attempt to update annually from mtweed.org)
- **Consistency**
  - Original mapped from BLM GCDB or 24k Topo Quads; Various data sources (map, resolution, GIS)
  - Potential topology errors exist within and between datasets (polygon / line)
  - Continue to work to align Census data to MSDI
- **Integrity / Business Relevance**
  - MCA, Federal, State, Local Government, Elections (SOS)
- **Update Frequency**
  - Published as needed; mainly if there is an update to CadNSDI
  - Annual Census BAS, Esri Community Basemap Program

Data Quality Matrix

Incorporated Cities and Towns

- **Spatial Accuracy and Precision**
  - Accuracy – mostly mapped to MSDI layers: parcels, CadNSDI
  - 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
  - Related table – Census BAS Annexations
- **Consistency**
  - Various data sources (map, resolution, GIS)
  - Potential topology errors exist within and between datasets
  - Continue to work to align Census data to MSDI
- **Integrity / Business Relevance**
  - MCA, Federal, State, Local Government, Elections (SOS)
- **Update Frequency**
  - Published as needed; currently around twice a year with election calendar
  - Annual Census BAS, Esri Community Basemap Program

Data Quality Matrix

School Districts (K-12, HS, EL)

- **Spatial Accuracy and Precision**
  - Accuracy – mostly mapped to MSDI layers: parcels, CadNSDI
  - 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
  - Related tables – Enrollment and County Superintendent info (OPI)
- **Consistency**
  - Various data sources (map, resolution, GIS)
  - Potential topology errors exist within and between datasets
  - Continue to work to align Census data to MSDI
- **Integrity / Business Relevance**
  - MCA, Federal, State, Local Government, Elections (SOS)
- **Update Frequency**
  - Published as needed; currently around twice a year with election calendar
  - Annual Census SDRP

Data Quality Matrix

Tax Increment Financing Districts (TIFDs)

- **Spatial Accuracy and Precision**
  - Accuracy – mostly mapped to MSDI layers: parcels, CadNSDI
  - 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
  - Related table – Levy Districts
  - Contains current, terminated, and some proposed districts: consider only showing current
- **Consistency**
  - Various data sources (map, resolution, GIS)
  - Overlap between different versions of the TIFD boundary
  - Schema includes dates and other business information from DOR
  - Continue to work to align Census data to MSDI
- **Integrity / Business Relevance**
  - MCA, State (DOR), Local Government
- **Update Frequency**
  - Published as needed; currently annually after update from DOR

Data Quality Matrix

Reservation Boundaries

- **Spatial Accuracy and Precision**
  - Accuracy – mostly mapped to Census and MSDI CadNSDI
  - Precision – varies across the state; depends on source datasets
  - Adjustment to 2025 CadNSDI in progress
- **Completeness**
  - Statewide coverage
  - Schema includes tribal nations names and Census attributes (Census is NSDI theme steward)
- **Consistency**
  - Mapped from US Census Bureau data
  - Potential topology errors exist within and between datasets (polygon / line)
- **Integrity / Business Relevance**
  - Federal, State, Local Government
- **Update Frequency**
  - Published as needed; mainly if there is an update to CadNSDI
  - Annually review Census boundaries

Data Quality Matrix

Managed Areas (and National Parks)

- **Spatial Accuracy and Precision**
  - Accuracy – mapped from various sources
  - Precision – varies across the state; depends on source datasets
- **Completeness**
  - Statewide coverage
  - Schema includes USGS PAD-US fields
  - To be viewed along side conservation easements and public lands
  - Lacking local data (parks)
- **Consistency**
  - Various data sources (map, resolution, GIS)
  - Overlap of management
  - Continue to work to align Census data to MSDI
- **Integrity / Business Relevance**
  - Federal, State, Local Government, Private Sector
  - MTNHP Map Viewer
- **Update Frequency**
  - Aim for annual update of at least state managed areas; update federal after USGS PAD-US published
  - Submit state and local updates to USGS PAD-US

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?
  - If you pick one improvement to prioritize, what would it be?

Next Steps

- Send out matrix for review and feedback
- Incorporate feedback into the final Data Quality Matrix
- Present to the MGIA Council in July
- Data Improvement Plan will be developed later this year
- Working Group to meet again this fall to review plan

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