Montana Geo-Enabled Elections

MAGIP Big Sky GeoCon

April 5, 2023

Montana State Library Team

Erin Fashoway – Montana GIS Coordinator

Michael Fashoway – Land Info Lead, MSDI Structures & Address Theme Lead

Meghan Burns – GIS Analyst, MSDI Boundaries Theme Lead

Caroline Psaltis – GIS Specialist

Table of Contents

01 – Overview and Progress: Erin Fashoway
02 – Election District Boundaries and Redistricting Resources: Meghan Burns
03 – Geoprocessing Solutions: Caroline Psaltis
04 – Addressing for NG9-1-1 and Geo-Enabled Elections: Michael Fashoway
05 – Grant Opportunities and Closing: Erin Fashoway

01

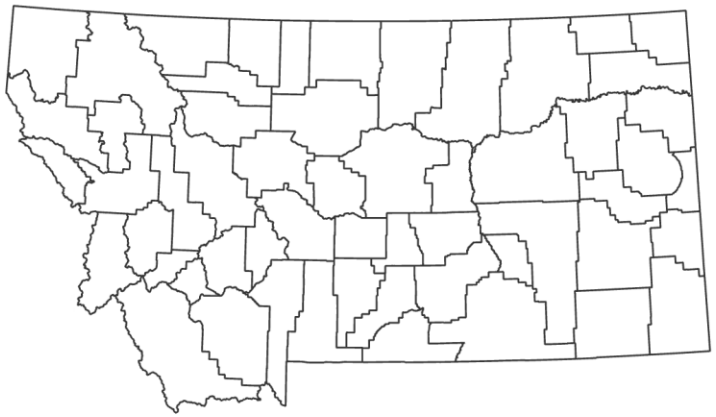
Overview and Progress

Erin Fashoway

Key Players and Roles

Montana Secretary of State (SOS)

Manages the Election Management System (EMS)



County Governments

County Election Administrators update the Election Management System (EMS) with Districts, Precinct Splits, Voter Info, and provide boundaries to MSL

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

Montana State Library (MSL)

Update and maintain addresses, boundaries, and precinct splits

BEST PRACTICES
for IMPLEMENTING GIS IN ELECTIONS

NSGIC GEO-ENABLED ELECTIONS

Strategy

Step 1

Develop Election Boundary Datasets

Step 2

Testing in the Election Management System

Step 3

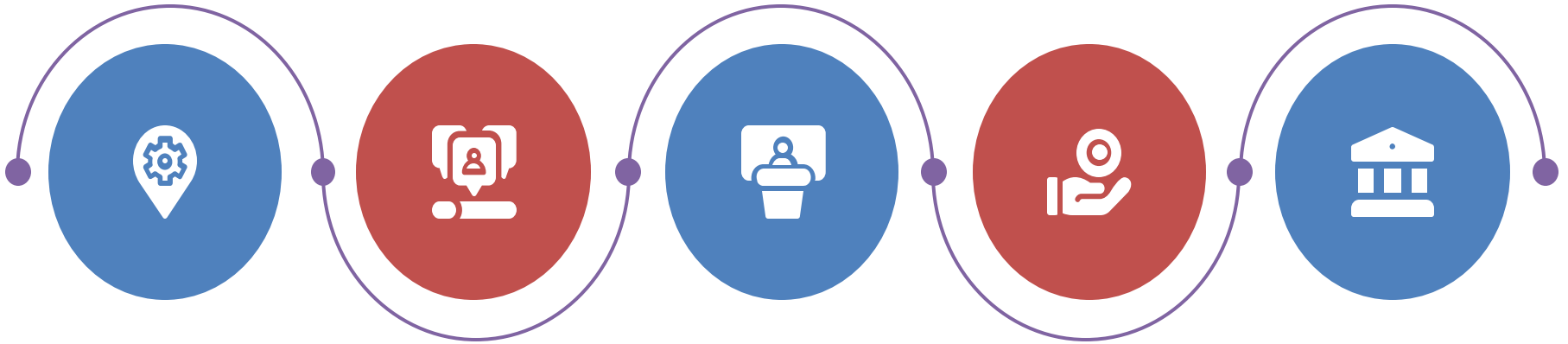
Refinement of Datasets

Step 4

Implementation and Publishing

Step 5

Data Maintenance



Goal: Create Precinct Splits for each County

What is a Precinct Split? Basically, a Ballot

- A Precinct Split is a subset of a Voting Precinct created by the various Election District Boundaries

- Not every County has an election for each type of district
  - Example: Hospital Districts

- Most counties have many of the same type of district
  Examples: Schools and Fire Districts

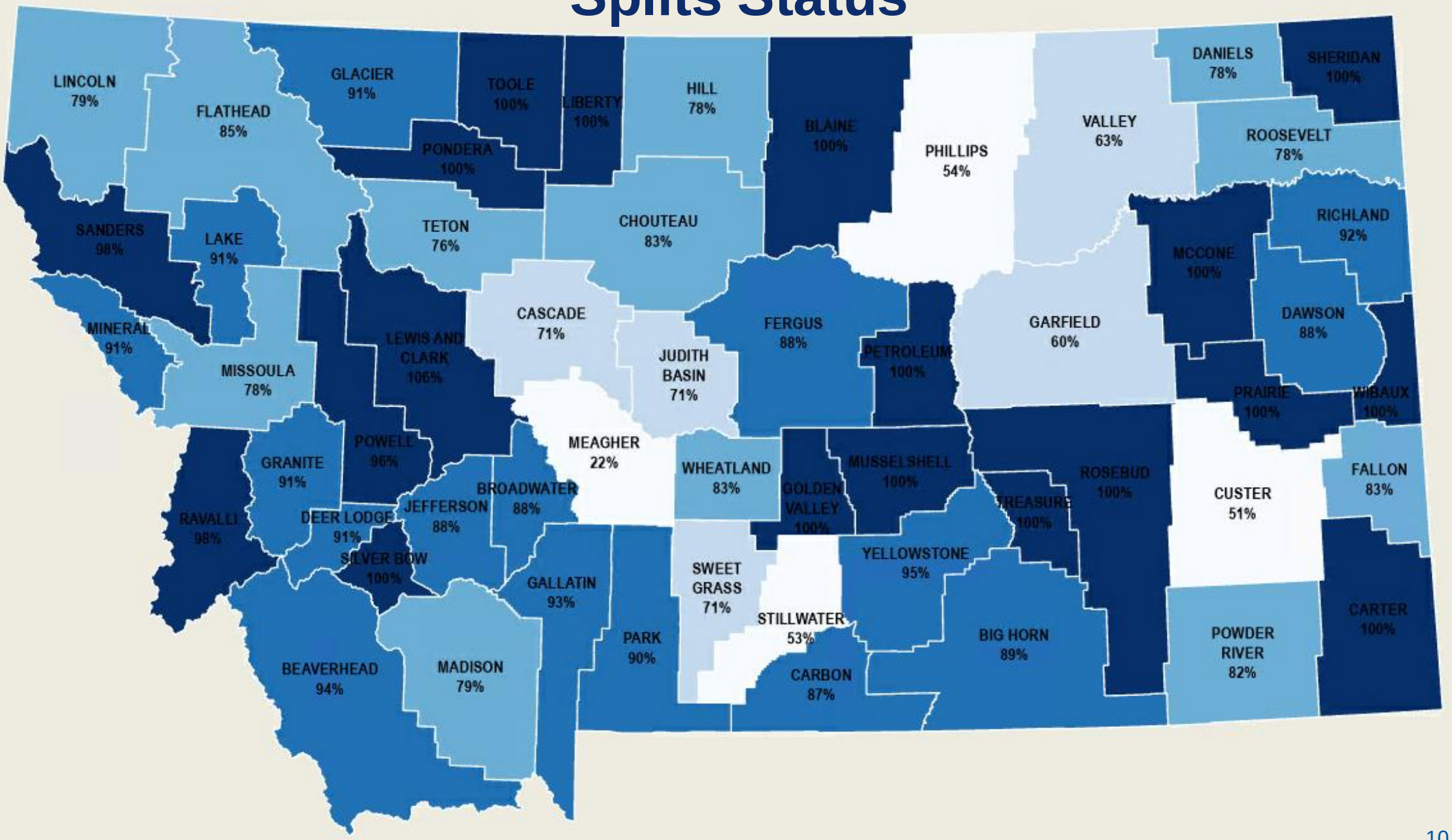
Election Calendar

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		

January 17 – ElectMT went live!

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)

Splits Status



*As of 3/27/2023, pre-redistricting

02

Election District Boundaries and Redistricting Resources

Meghan Burns

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

Goal: Provide GIS Layers for Election System

Current Base Layers (Foundational):

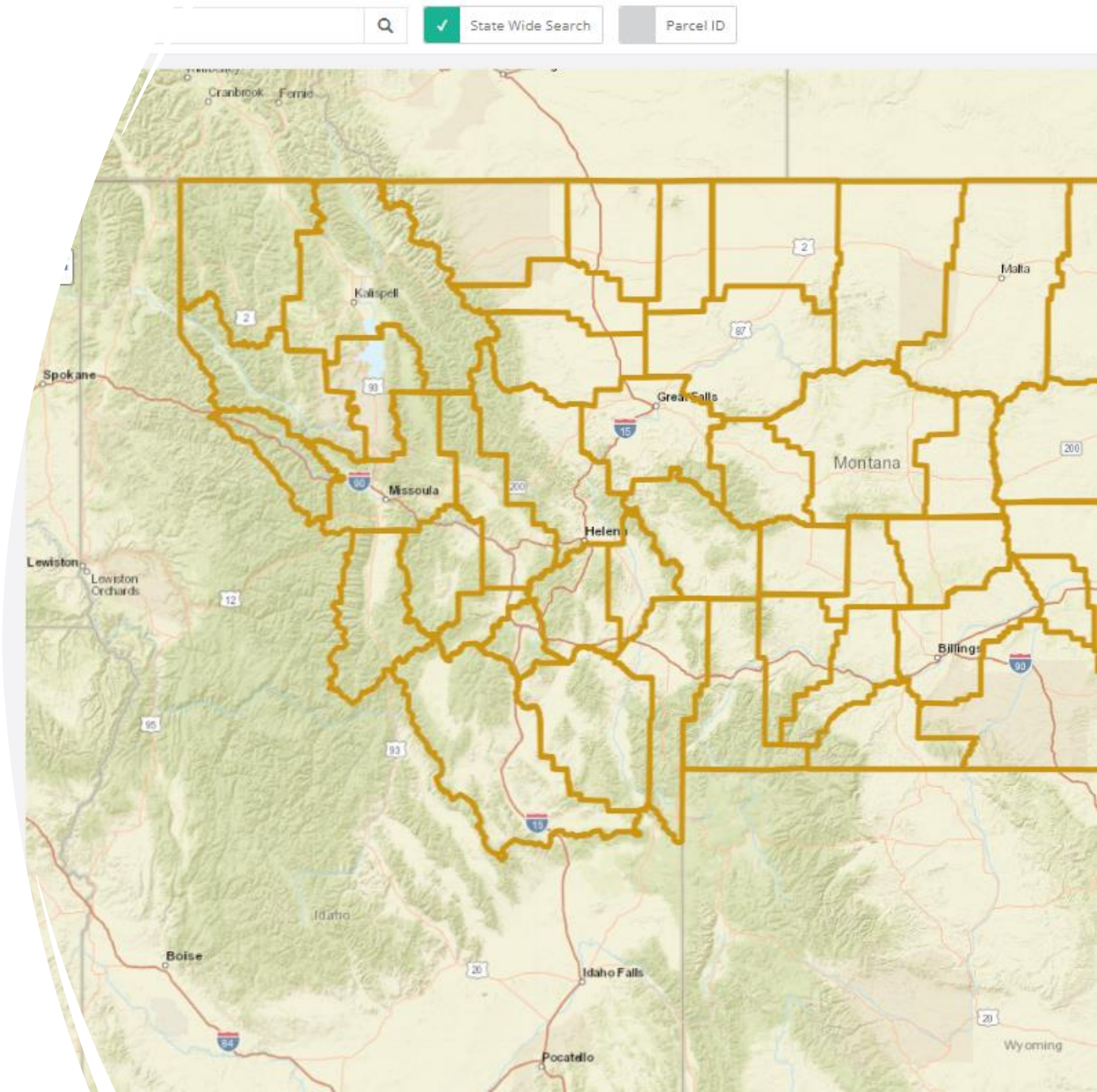
- County
- City
- Zip Code

Requested:

- School Districts
- Legislative Senate and House Districts (2024-2032)
- County Commissioner Districts

Updated is needed in TotalAddress

- MSL sends SOS a geojson file to upload



Goal: Map all Election Districts and Precinct Splits

Election District Status

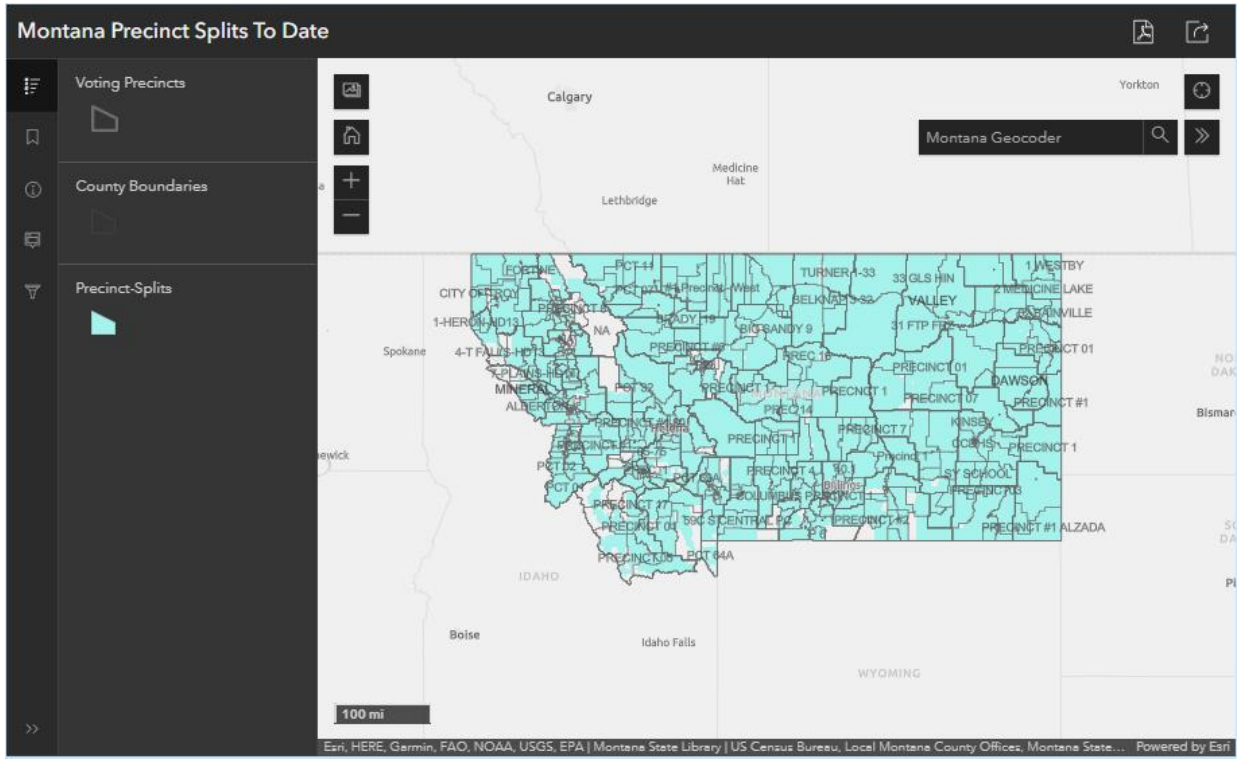
- Mapped all but 6 water/sewer districts

County Commissioner Districts

- Missing Golden Valley and Treasure

Created Precinct Splits for all counties

- Continue to work with counties to refine their Election Districts and Precinct Split Boundaries



Boundary Update Workflow

Step 1

Collect District Boundaries from County Election Administrators & GIS Managers

Step 2

Create Schema & Data Layers

Step 3

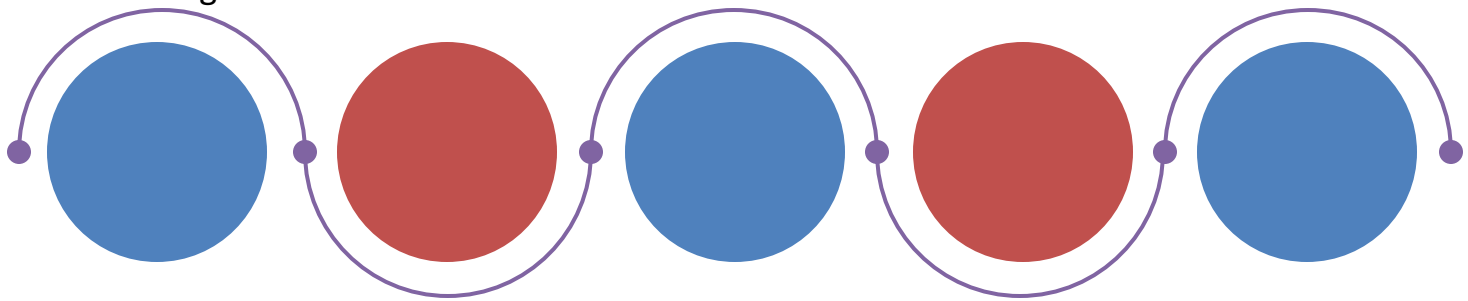
Digitize District Boundaries

Step 4

Review EMS Updates/ Update Districts in SDE

Step 5

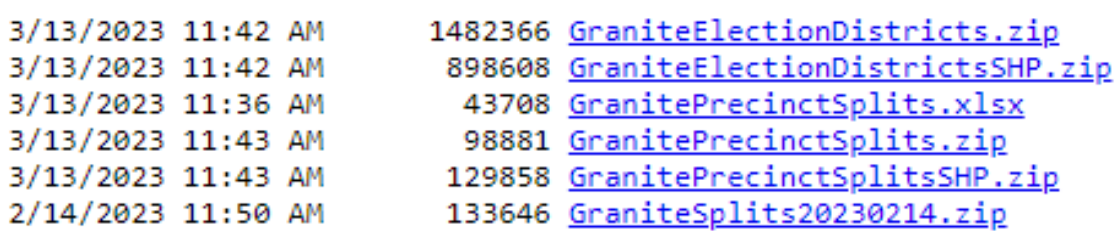
Publish District Boundaries



Step 5: Publish Boundaries

All Election Districts and Precinct Splits have been published

- Available Statewide and by County
- File Geodatabase, Shapefile, and Web Services
- Current Precinct Splits table



3/13/2023	11:42 AM	1482366	GraniteElectionDistricts.zip
3/13/2023	11:42 AM	898608	GraniteElectionDistrictsSHP.zip
3/13/2023	11:36 AM	43708	GranitePrecinctSplits.xlsx
3/13/2023	11:43 AM	98881	GranitePrecinctSplits.zip
3/13/2023	11:43 AM	129858	GranitePrecinctSplitsSHP.zip
2/14/2023	11:50 AM	133646	GraniteSplits20230214.zip

Visit MSDI Boundary Page for: https://msl.mt.gov/GIS/Boundaries

- Metadata Records
- Download Links
- Web Services: https://gisservicemt.gov/arcgis/rest/services/MSDI_Framework/Boundaries/MapServer
- Web Maps/Apps Gallery

Data Layers are also discoverable in the Data List:

- https://msl.mt.gov/GIS/DataList

Redistricting

Following a federal decennial census new Congressional and Legislative Districts must be we redrawn:

- Congressional Districts adopted: November 12, 2021
- Legislative House & Senate Districts adopted: February 23, 2023

https://mtredistricting.gov/

Once redistricting is complete each county has 45 days to review their Voting Precincts to make sure they conform to the new legislative districts. Precincts should equalize the number of electors as nearly as possible

County Commissioner Districts should also be reviewed to be as compact and equal in population and area as possible following a decennial census

Redistricting Timeline

Final Approval of County Voting Precincts by April 8

- Sent to SOS
- Send to MSL as soon as possible
- Resolutions, GIS Data Layers, Maps

School Elections in May (with current legislative districts (2014-2022) and voting precincts

Add New House/Senate Districts (2024-2032) to ElectMT in June

Election Administrators will update Precincts in ElectMT in June

- In Test first, than Production

MSL will create Precinct Split boundaries with new Precincts in June

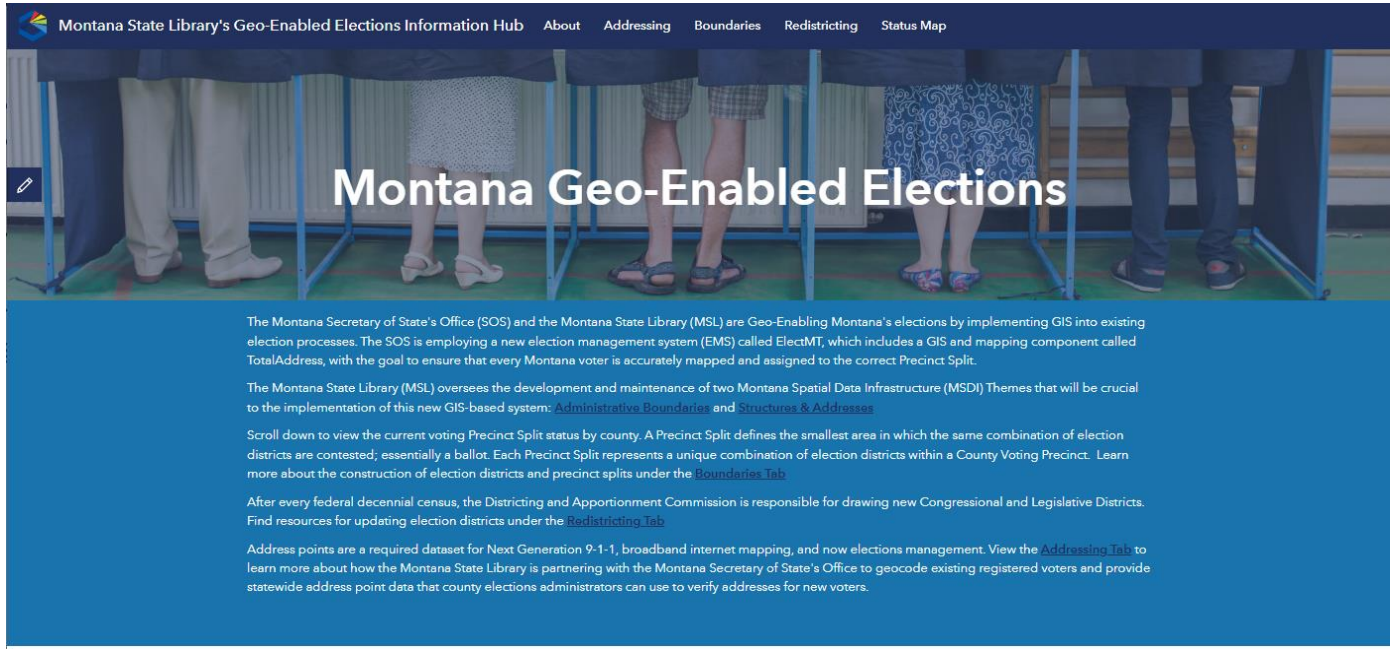
- Send for review to Counties
- Send to SOS to update them in TotalAddress

Geo-Enabled Elections Hub Updates

Boundary Page Now has a Calendar with Update Schedule

The Hub Site now has Redistricting Info:

- Links to Montana Code Annotated
- Interactive Maps/Apps
- Download Data Layers
- Access Population Analysis Reports
- View and Print Maps
- Video describing resources
- ArcGIS Pro Tools and Project
- List of Redistricting Software
- List of GIS Contractors from MAGIP



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

03

Geoprocessing Solutions

Caroline Psaltis

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

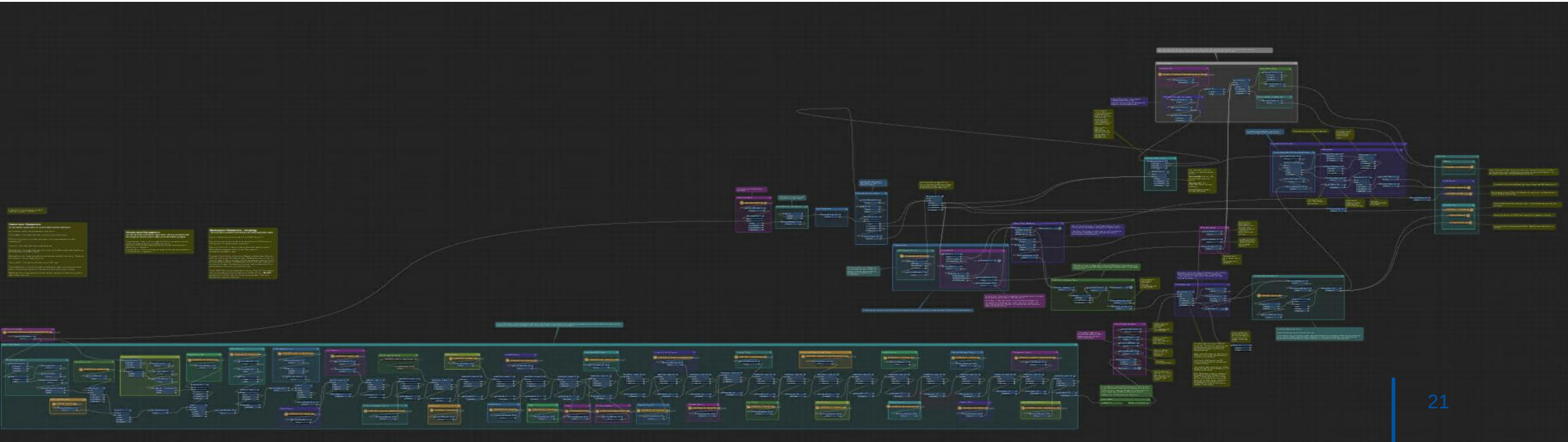
Precinct Splits Generation Requirements

CountyC	CountyNam	PrecinctPart	PrecinctName	SplitCo	House	Statew	Senate	County	Congressional	Supreme_Court_Justice	Public_Service_Commission	Judicial	Commissioner	School	Fire	Soil_Conservation	City_Town	Ward	Rural
03	Blaine	NO CHINOOK 13-33 -	NO CHINOOK 13-33	01	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 10		SOIL CONSERVATION			RURAL
03	Blaine	SO CHINOOK 10-32 -	SO CHINOOK 10-32	02	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 14		SOIL CONSERVATION			RURAL
03	Blaine	TURNER 1-33 - 06	TURNER 1-33	06	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 06		SOIL CONSERVATION			RURAL
03	Blaine	HAYS 15-32 - 03	HAYS 15-32	03	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #1	SCHOOL 50L		SOIL CONSERVATION			RURAL
03	Blaine	SO CHINOOK 10-32 -	SO CHINOOK 10-32	05	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 12H		SOIL CONSERVATION			RURAL
03	Blaine	HARLEM 9-32 - 01	HARLEM 9-32	01	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12B		SOIL CONSERVATION			RURAL
03	Blaine	CHINOOK 11-33 - 02	CHINOOK 11-33	02	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 10		SOIL CONSERVATION	CITYWIDE CHINOOK	CITY COUNCIL WAF	
03	Blaine	SO CHINOOK 10-32 -	SO CHINOOK 10-32	01	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 10		SOIL CONSERVATION			RURAL
03	Blaine	NO CHINOOK 13-33 -	NO CHINOOK 13-33	02	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 17		SOIL CONSERVATION			RURAL
03	Blaine	CHINOOK 11-33 - 01	CHINOOK 11-33	01	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 10		SOIL CONSERVATION	CITYWIDE CHINOOK	CITY COUNCIL WAF	
03	Blaine	TURNER 1-33 - 01	TURNER 1-33	01	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 43		SOIL CONSERVATION			RURAL
03	Blaine	HAYS 15-32 - 02	HAYS 15-32	02	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #1	SCHOOL 12B		SOIL CONSERVATION			RURAL
03	Blaine	HAYS 15-32 - 01	HAYS 15-32	01	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #1	SCHOOL 50H		SOIL CONSERVATION			RURAL
03	Blaine	SO CHINOOK 10-32 -	SO CHINOOK 10-32	03	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 17		SOIL CONSERVATION			RURAL
03	Blaine	HARLEM 8-32 - 04	HARLEM 8-32	04	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12H		SOIL CONSERVATION			RURAL
03	Blaine	TURNER 1-33 - 02	TURNER 1-33	02	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12H		SOIL CONSERVATION			RURAL
03	Blaine	TURNER 1-33 - 04	TURNER 1-33	04	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 17		SOIL CONSERVATION			RURAL
03	Blaine	TURNER 1-33 - 03	TURNER 1-33	03	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12-43		SOIL CONSERVATION			RURAL
03	Blaine	HARLEM 8-32 - 06	HARLEM 8-32	06	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12H		SOIL CONSERVATION	CITYWIDE HARLEM	CITY COUNCIL WAF	
03	Blaine	BELKNAP 3-32 - 01	BELKNAP 3-32	01	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #1	SCHOOL 12B		SOIL CONSERVATION			RURAL
03	Blaine	SO CHINOOK 10-32 -	SO CHINOOK 10-32	04	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #2	SCHOOL 67		SOIL CONSERVATION			RURAL
03	Blaine	HARLEM 8-32 - 05	HARLEM 8-32	05	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 12H		SOIL CONSERVATION	CITYWIDE HARLEM	CITY COUNCIL WAF	
03	Blaine	BELKNAP 3-32 - 02	BELKNAP 3-32	02	House District 32	Montana	Senate District 16	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #1	SCHOOL 12H		SOIL CONSERVATION			RURAL
03	Blaine	TURNER 1-33 - 05	TURNER 1-33	05	House District 33	Montana	Senate District 17	Blaine	2ND CONGRESSIONAL	SUPREME COURT JUSTICE	Public Service Commissioner, District 1	Judicial District 17	COMMISSIONER DISTRICT #3	SCHOOL 43-12		SOIL CONSERVATION			RURAL

- A table of precinct-splits per county from ElectMT with each district name and type in split.
- Each election district in a county needs to be digitized and/or have its boundary updated to reflect the most up to date information.
- A field in each district layer that matches the name in the precinct-splits table.

Precinct Splits Generation

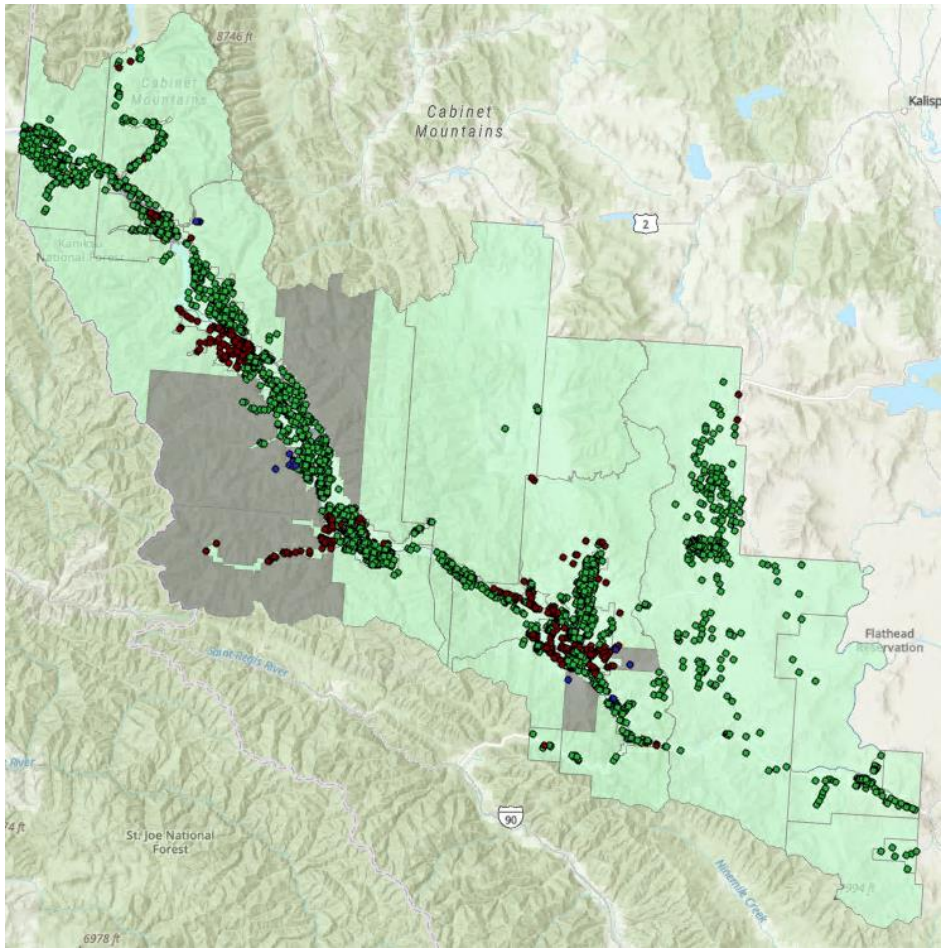
- Repeatable process – Each county has a workspace and file geodatabase based off of templates
- Easy to update (add/remove) SDE layers for election district overlay (great for redistricting!)
- Now includes voter counts per precinct split to help QC
- Generates precinct splits along with address layers to help QC
- Helps ID any missing precinct splits and voter address that don’t match a precinct split for county



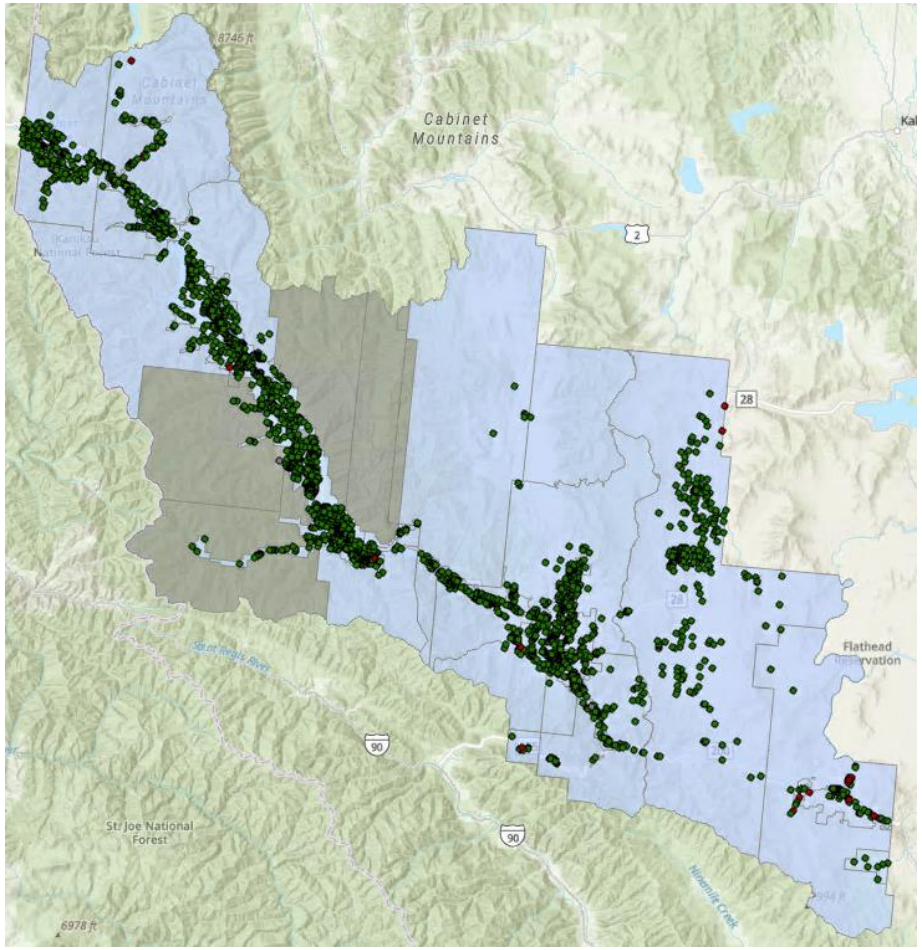
QC Process – Sanders Example

	2022	2023
Total Splits	50	47
Splits Found (FME)	39	47
Missing Splits	11	0

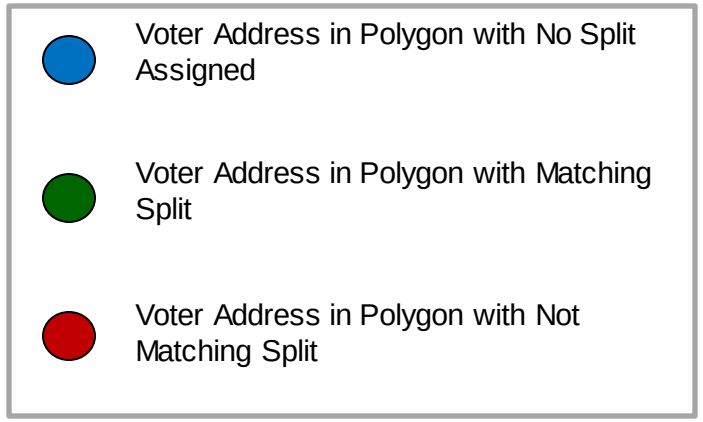
2022

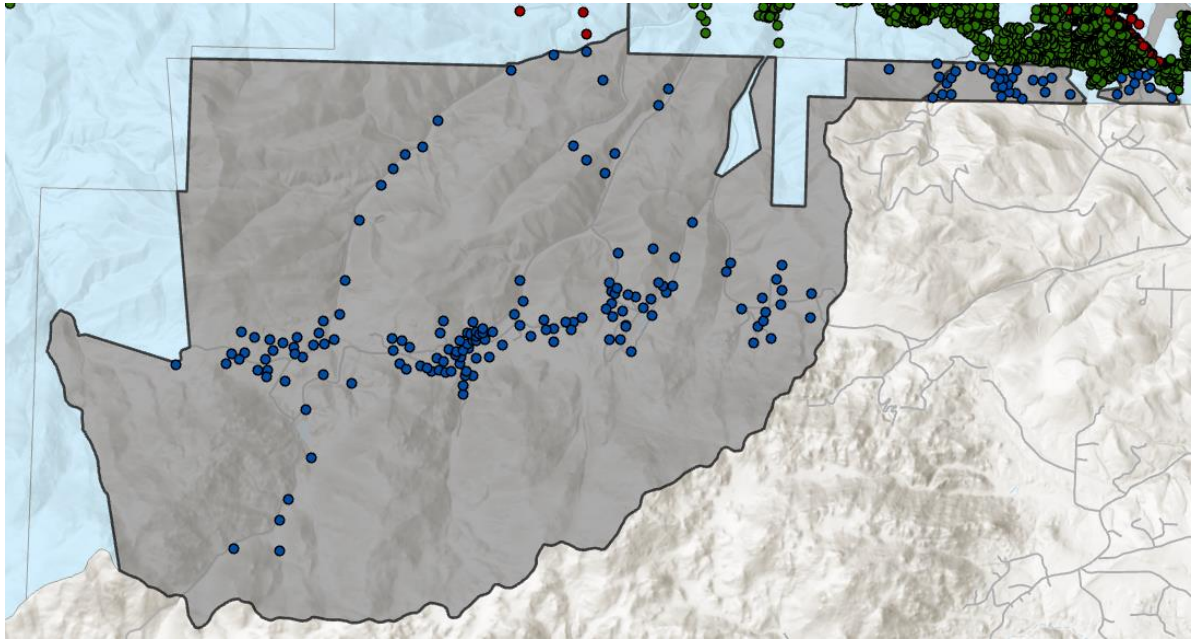


2023

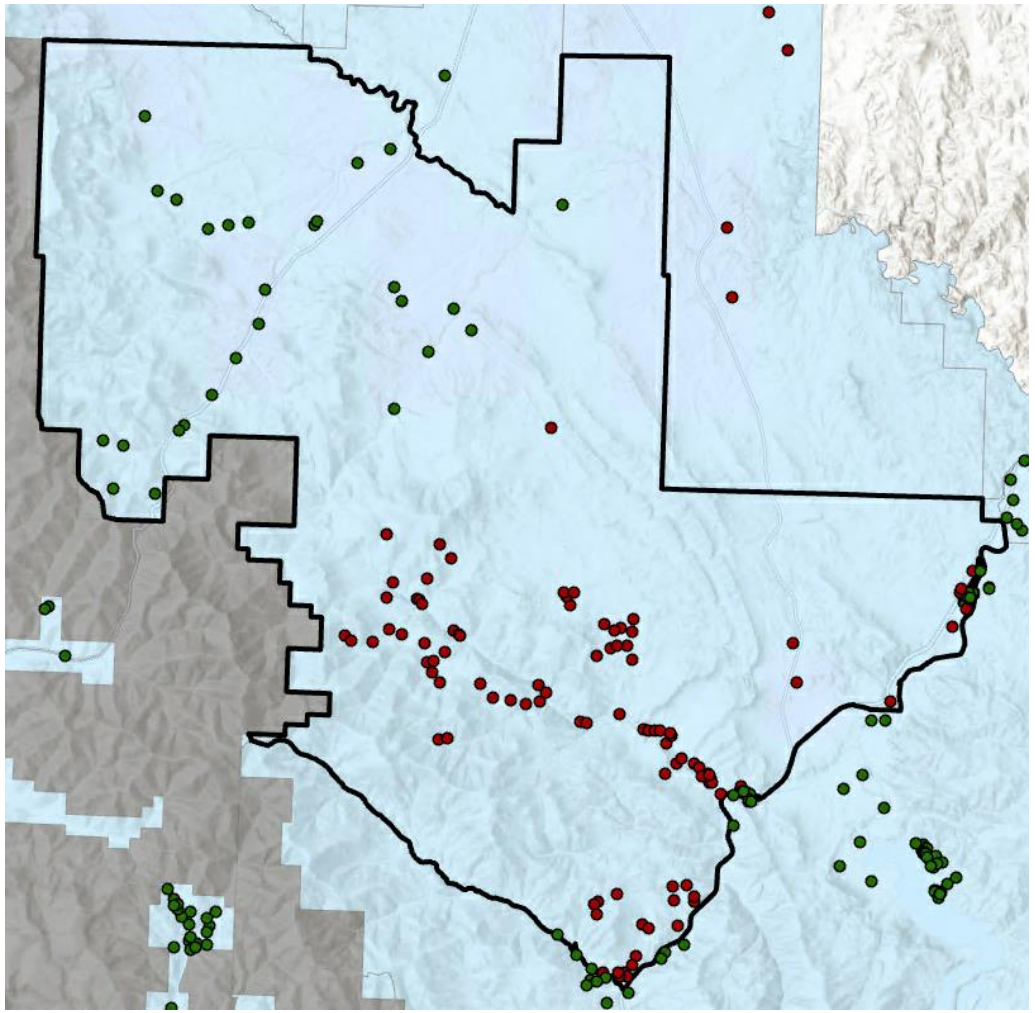


QC Process Cont.



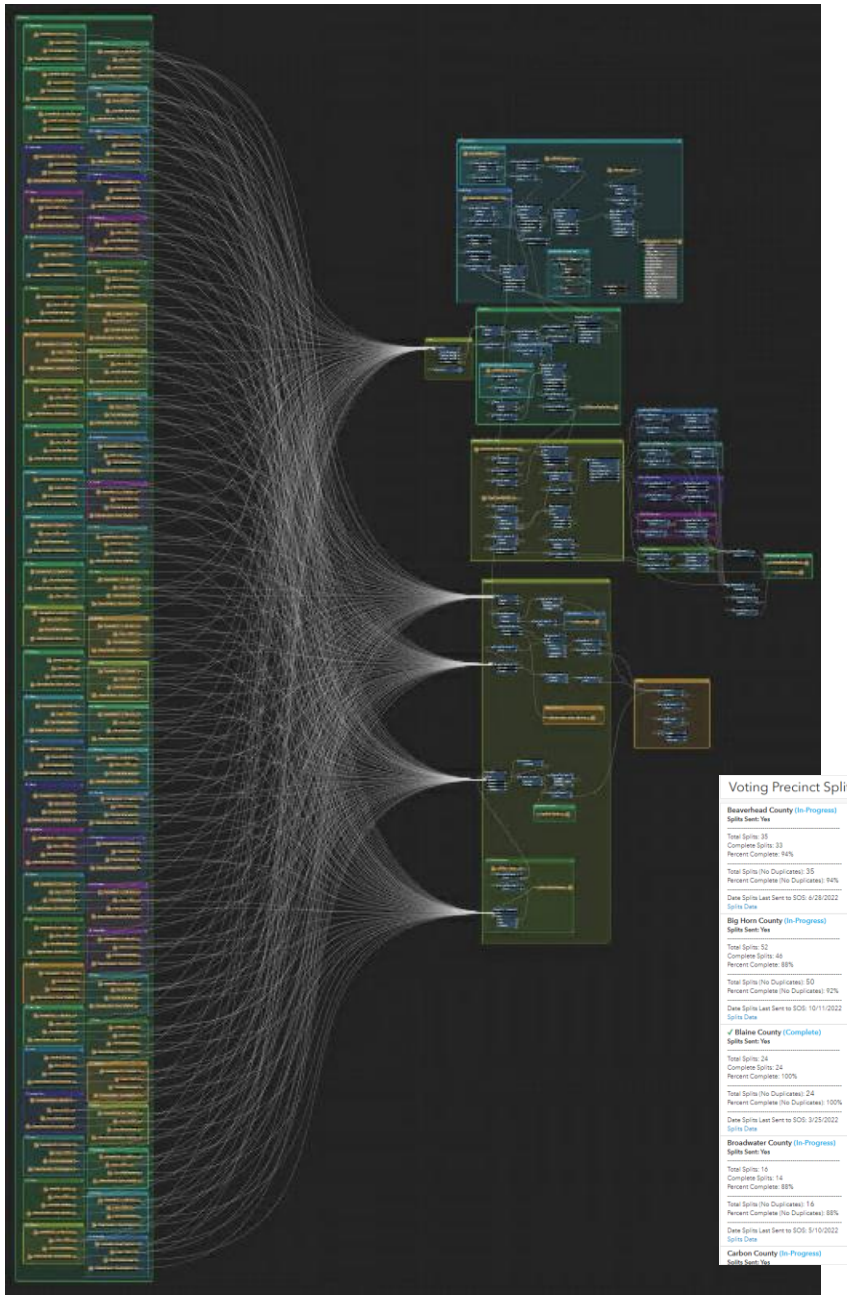


Voter addresses in polygon with unassigned split (has since been corrected)

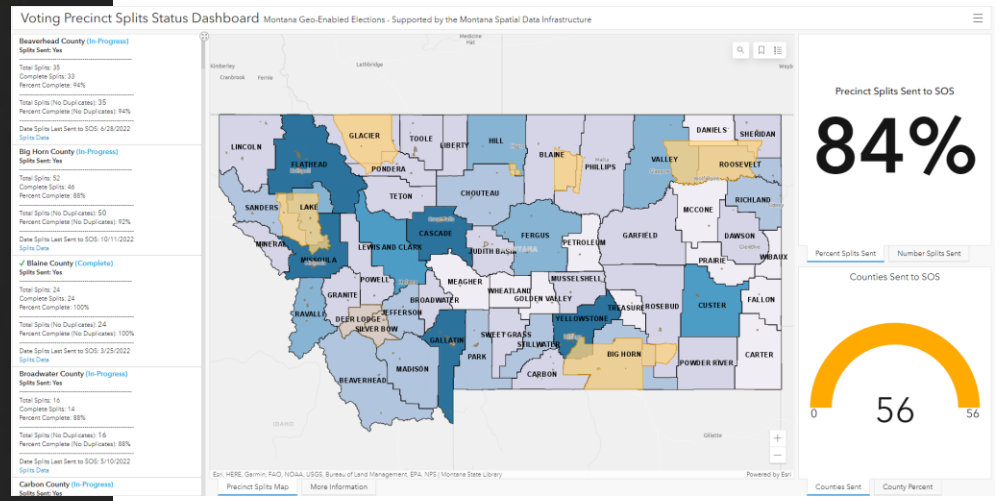


Duplicate split assignment in a split polygon
(has since been corrected)

Statewide Splits Update



```python
#gdb names
gdb2 = "MTCountySplits.gdb"

##Import, overwrite, and append MTCountySplits feature class
gdb2Path = os.path.join(folder2,gdb2)
print(gdb2)
env.workspace = gdb2Path
env.overwriteOutput = True

#stop geoprocessing from metadata
if arcpy.GetLogMetadata():
    arcpy.SetLogMetadata(False)

arcpy.FeatureClassToFeatureClass_conversion(original2,gdb2Path,fc2)
print("MTCountySplits has been imported to MTCountySplitsGDB.")

outFile = gdb2Path + '.zip'
zipFileGeodatabase(gdb2Path,outFile)

county_properties = {'title':'CountySplitInfo',
                     'tags': 'geoenabled elections, montana',
                     'type':'File Geodatabase',
                     'overwrite':'True'}

county_gdb = gis.content.add(county_properties,gdb2Path+".zip")
county_item = gis.content.get(item_ID2)
countyLayer = county_item.layers[0]
print(countyLayer.properties.name)

countyLayer.append(item_id=county_gdb.id,
                   upload_format='filegdb',
                   source_table_name="MTCountySplits",
                   upsert=True,
                   skip_inserts=True,
                   upsert_matching_field='NAME',
                   update_geometry=False)
county_gdb.delete()
```



- Creates statewide splits layer and address point layer for QCing and FTP site
- Update precinct splits and layers on AGOL that are behind Splits Status Dashboard

Statistics

Number of Counties Submitted to SOS

56 of 56 (100%!)

47 of 56 (~84%)

Number of Unique Districts

2,315

2,209

Total Number of Election District Types

33

33

Number of Splits Sent to SOS

2555 of 3040 (~84%)

2113 of 2950 (~72%)

County with the most Splits

Missoula - 333

Flathead - 299

County with the fewest splits

Treasure/Meagher - 2

Treasure/Meagher - 2

Statistics as of 3/26/2023 (pre-redistricting)

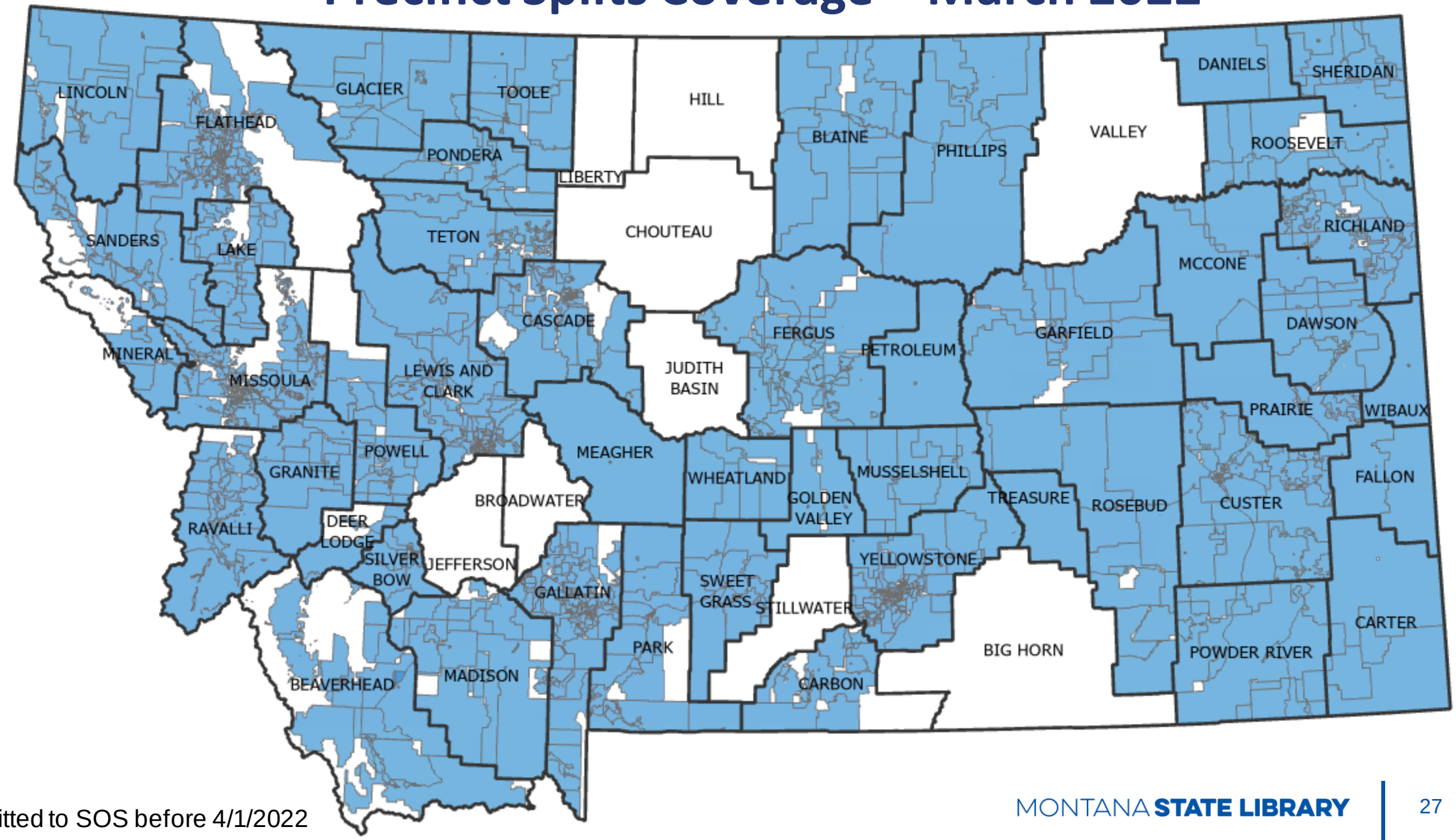
Statistics Cont.

March 2023	
Splits Found (FME)	2,555
Total Splits	3,040
Total Voters (ElectMT)	672,342
Voters not in Assigned Split	16,020

March 2022	
Splits Found (FME)	2,113
Total Splits	2,950
Total Voters (ElectMT)	647,083
Voters not in Assigned Split	73,196

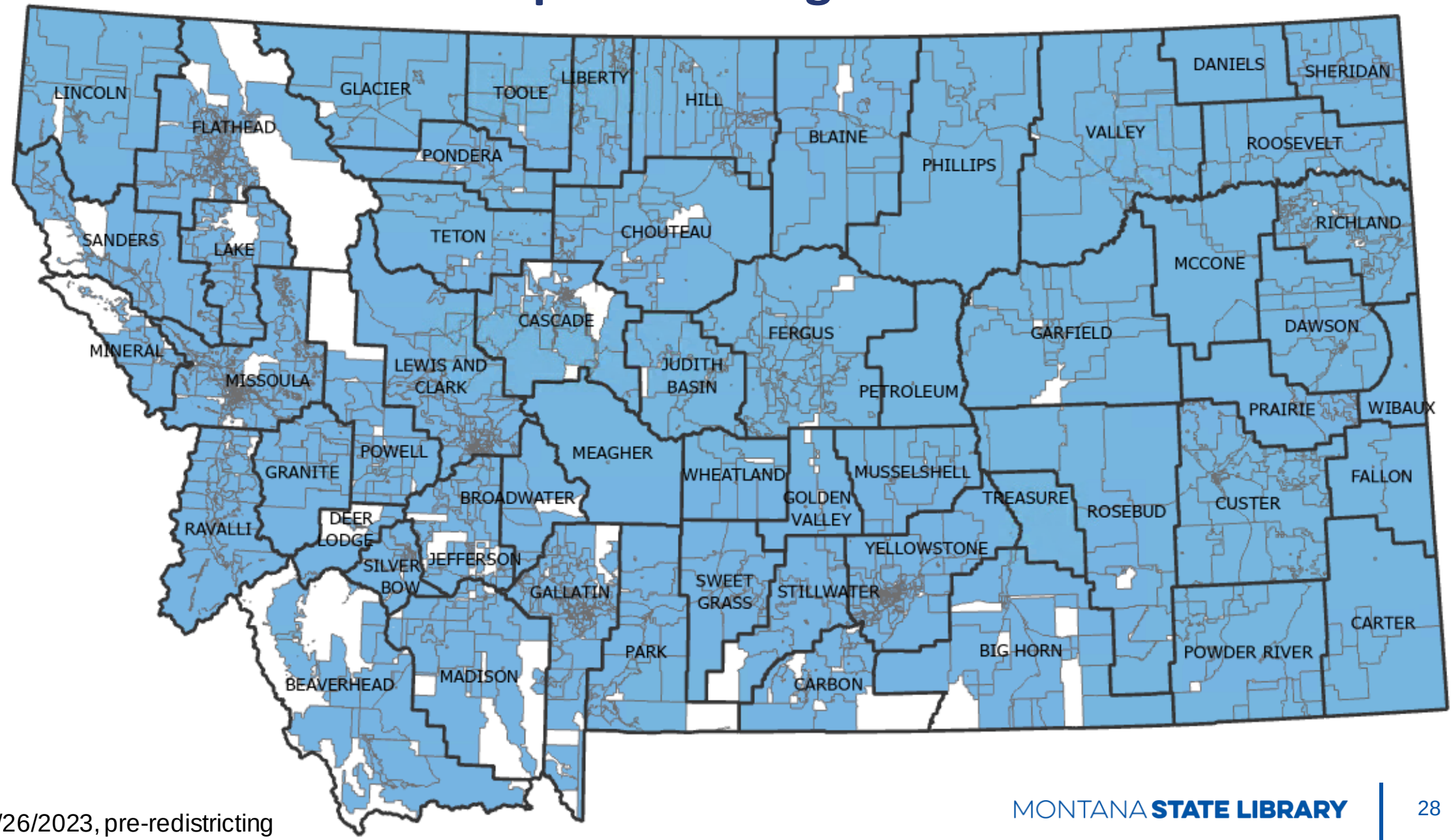
March 2023: Precinct Split numbers as of 3/26/2023 (pre-redistricting)

Precinct Splits Coverage – March 2022



* Submitted to SOS before 4/1/2022

Precinct Splits Coverage – March 2023



*As of 3/26/2023, pre-redistricting

04

Addressing for NG9-1-1 and Geo-Enabled Elections

Michael Fashoway

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

Address Data Requirements

- Complete address point data for entire County, including incorporated cities/towns
- Standardized GIS address point data (to NENA NG9-1-1 standards), including Postal Community names and ZIP Codes
  - NENA NG9-1-1 standardized data can be easily reformatted to USPS Pub28 standard that elections needs
- Address point located on structure/rooftop

Geocoding Voter Addresses Review

- Prior to go-live with the ElectMT system:
  - SOS provided MSL with addresses of all registered voters
  - MSL geocoded voters addresses
  - MSL backfilled the remaining non-voter addresses
  - Addresses reformatted to USPS Pub28 standard
  - Duplicate addresses removed
  - SOS loaded addresses into TotalAddress
- Several iterations of this process were done in 2021 and 2022
- Processes will be different now going forward

Voter Address Maintenance

- TotalAddress will be validated/updated twice a year
  - January/February
  - June/July
- New update process will be change detection between TotalAddress and GIS (rather than a complete re-geocoding of the voter addresses)
  - This will catch changes that were made in TotalAddress but not in GIS, and visa versa
- Any differences will need to be reviewed
  - Therefore, minimizing those differences will save work in the end

Voter Address Maintenance

- In the meantime, Elections Adminstrators and those assigning new addresses and maintaining GIS address points will need to coordinate
  - As new addresses are assigned, make sure they are added to both GIS and TotalAddress, with attention paid to exactly match the Lat/Long and address
  - As issues are discovered with existing addresses, either the location or with the address itself, make sure updates are made to both TotalAddress and GIS
- A number of counties are using ArcGIS Online web maps/applications to share their most current address data for elections staff to reference

05

Grant Opportunities

Erin Fashoway

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

MLIA Grant Program

Annual Grant Program fund GIS Data Projects to meet the purpose implementing goals of the land information plan.

Eligible Grant Recipients:

- State Agencies (Includes Montana University)
- Local Governments/Agencies
- Tribal Governments or Tribal Entities

Please direct all grant program questions to MLIAGrants@mt.gov

FY2024 Land Information Plan Grant Priorities

Tier 1 Priorities - Create or update datasets and develop workflows for the purpose of continued participation in the Montana Spatial Data Infrastructure or other statewide data collection initiatives listed below:

a. Develop GIS Information to Support Next Generation 9-1-1 (NG9-1-1) – Development of GIS data that are National Emergency Number Association (NENA) Standard Compliant.

b. Montana Spatial Data Infrastructure Improvement to Cadastral and Administrative Boundaries Themes

c. Integrating GIS into the Planning and Preparation for Geo-Enabled Elections.

MLIA Grant Program Timeline

Grant criteria/application published	January 15
Grant application received by the MSL deadline	before 5:00pm on February 15
Grant application revision deadline	March 1
Grant applications prioritized for funding by MSL/ MLIAC Grant Subcommittee	by May 1
Grants applications funding approval by Montana State Library Commission	by May 15
Start of grant year	July 1
Quarterly status reports	as negotiated
Close of grant year	June 30

MLIA Grant Projects Awarded for Current Grant Year - FY2023

Rank	Applicant	Identified Priority	Awarded
1	Missoula County	Build GIS Capacity: Local Information Needs	$43,703
2	Butte-Silver Bow	Support NG 9-1-1	$43,520
3	Beaverhead County	Support NG 9-1-1	$38,500
4	Stillwater County	Improve Land Records: PLSS	$21,000
5	McCone County	Improve Land Records: PLSS	$45,000
6	Meagher County	Support NG 9-1-1	$26,000
7	Teton County	Geo-Enabled Elections	$16,000
8	Custer	Support NG 9-1-1	$16,277

Funding Opportunity through Montana Secretary of State's Help America Vote Act (HAVA) Funding.

Funding can be used for development of necessary GIS Data Layers to Support County's Geo-Enabled Elections Efforts.

For More Information:

Stuart Fuller - sfuller@mt.gov

Contact Information

Hub Site - https://geoenabled-elections-montana.hub.arcgis.com/

Project – GeoEnabledElections@mt.gov

Erin Fashoway – efashoway@mt.gov

Michael Fashoway – mfashoway@mt.gov

Meghan Burns – mburns2@mt.gov

Caroline Psaltis – cpsaltis@mt.gov

MONTANA STATE LIBRARY
A GREATER STATE OF KNOWLEDGE

Thank you!