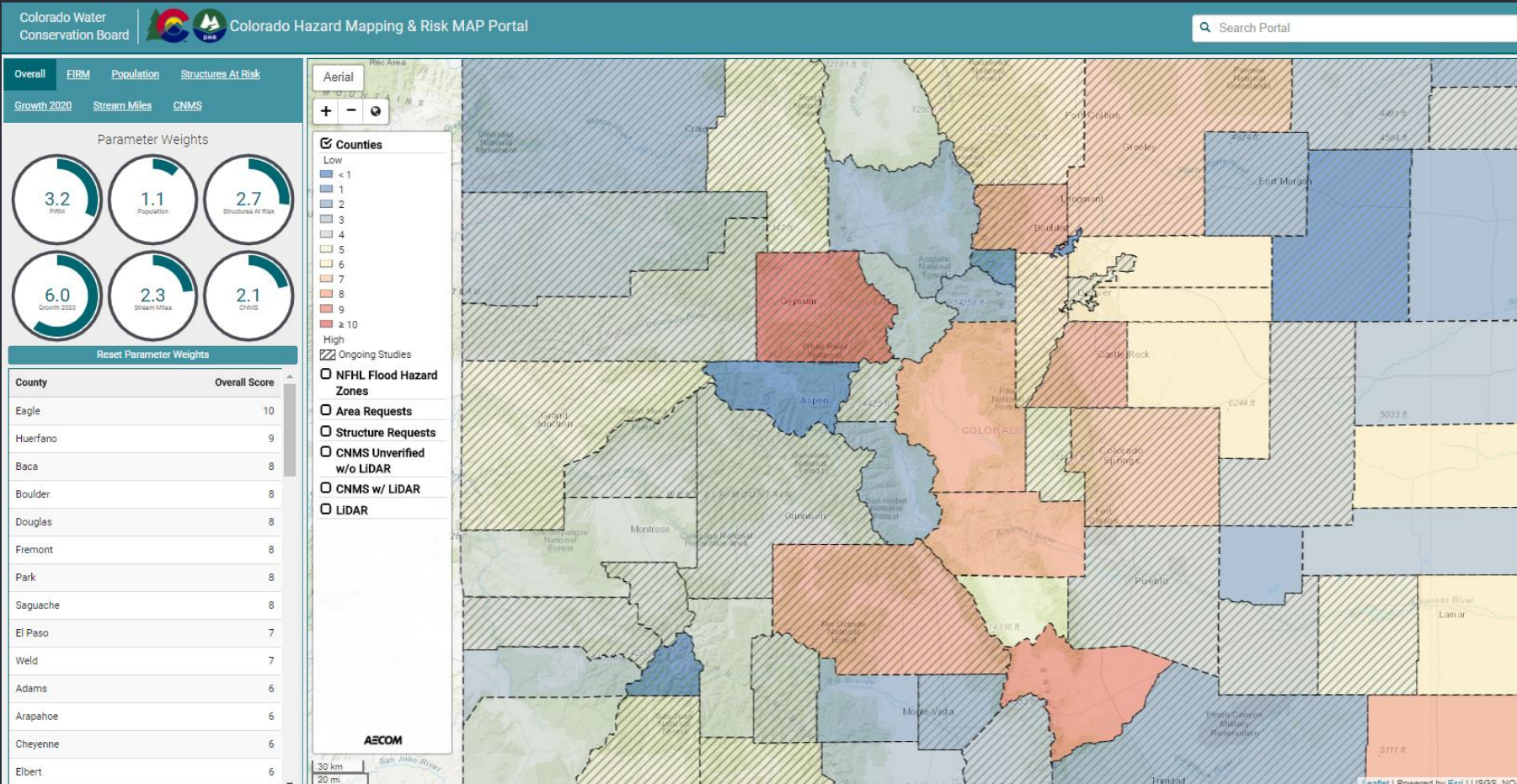


Prioritizing Risk Map Projects in Colorado

An Innovative
Multi-Factored
Approach

Thuy Patton



Risk MAP Program in Colorado

Partnership Program



FEMA REGIONS



Colorado Risk MAP

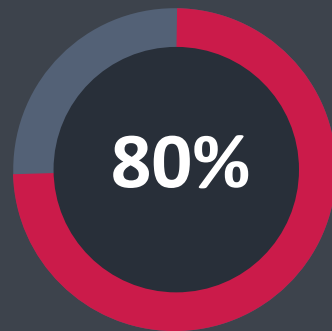
Colorado

68,382 Riverine miles in Region VIII

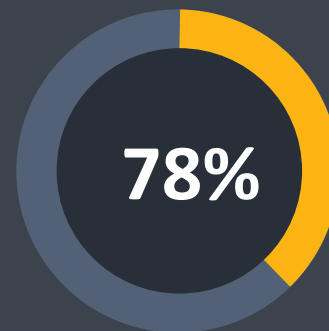
- 17,123 miles in Colorado
- 12,689 miles in Montana
- 6,706 miles in North Dakota
- 13,564 miles in South Dakota
- 6,837 miles in Utah
- 11,408 miles in Wyoming



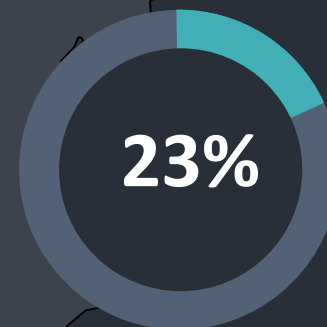
Active and
New Projects
in 51 Counties



LiDAR
Coverage in
Colorado



FEMA Region
VIII Funding

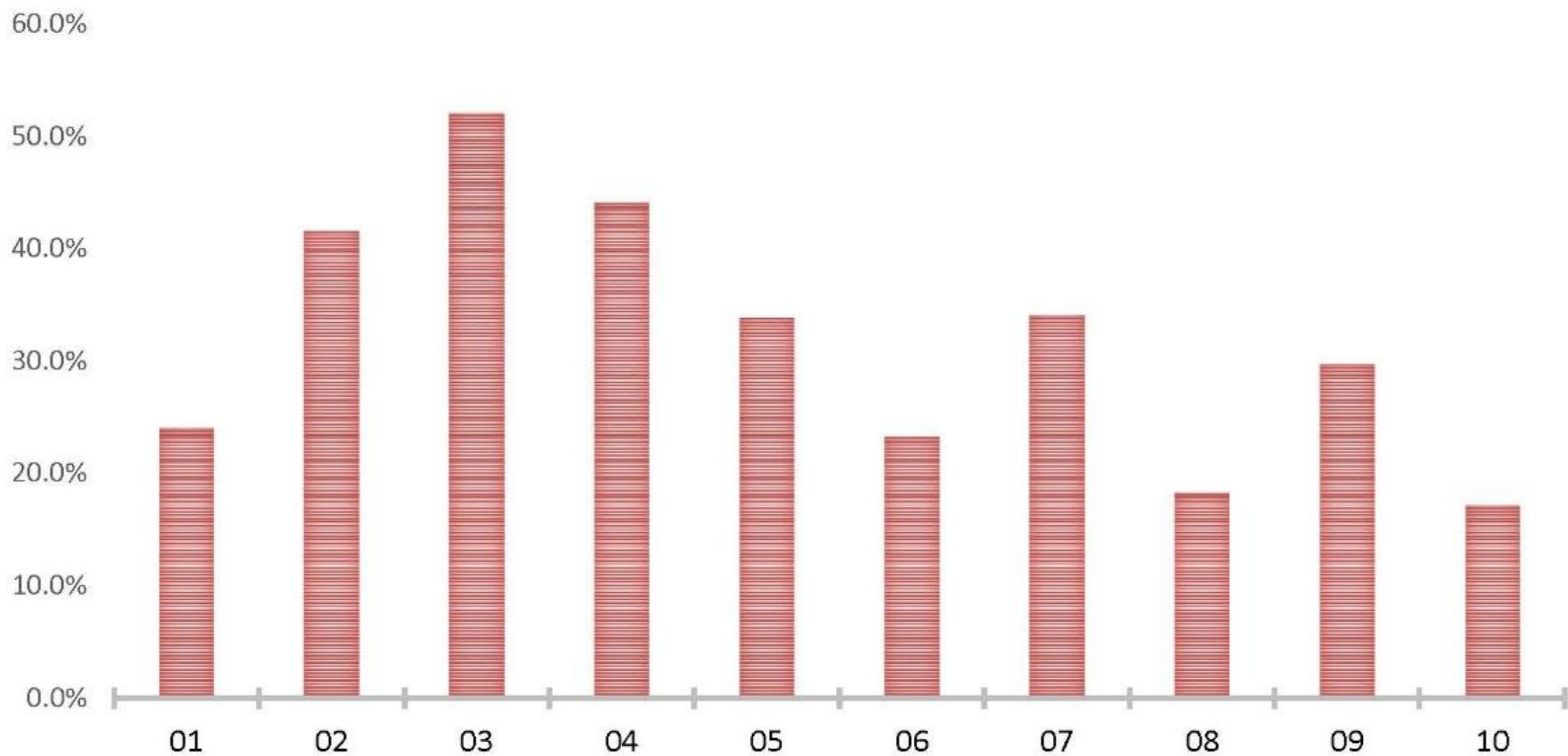


FEMA Metrics VS Colorado

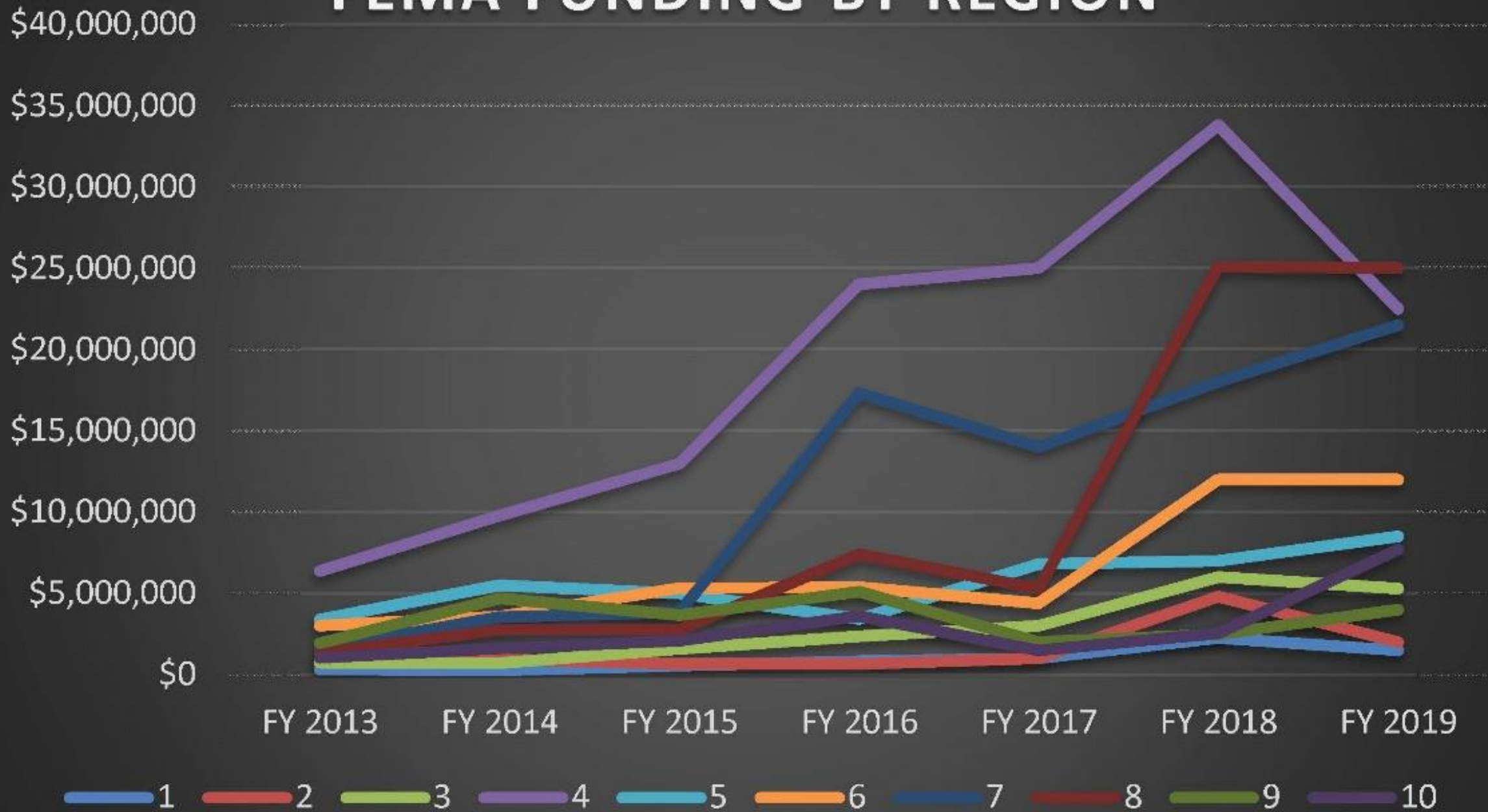
- NVUE (stream miles with New, Validated, or Updated Engineering
- Mitigation Action (# of communities that identify an action and take steps to move it forward)
- Paper Inventory Reduction
- Levees
- LiDAR Availability/Stream Miles
- Paper Inventory/Age of Maps
- Local Growth/Development
- Structures Impacted
- Population



NVUE BY FEMA REGION



FEMA FUNDING BY REGION



Prioritization Check List



FIRM PANEL AGE



GROWTH RATES



POPULATION



STREAM MILES

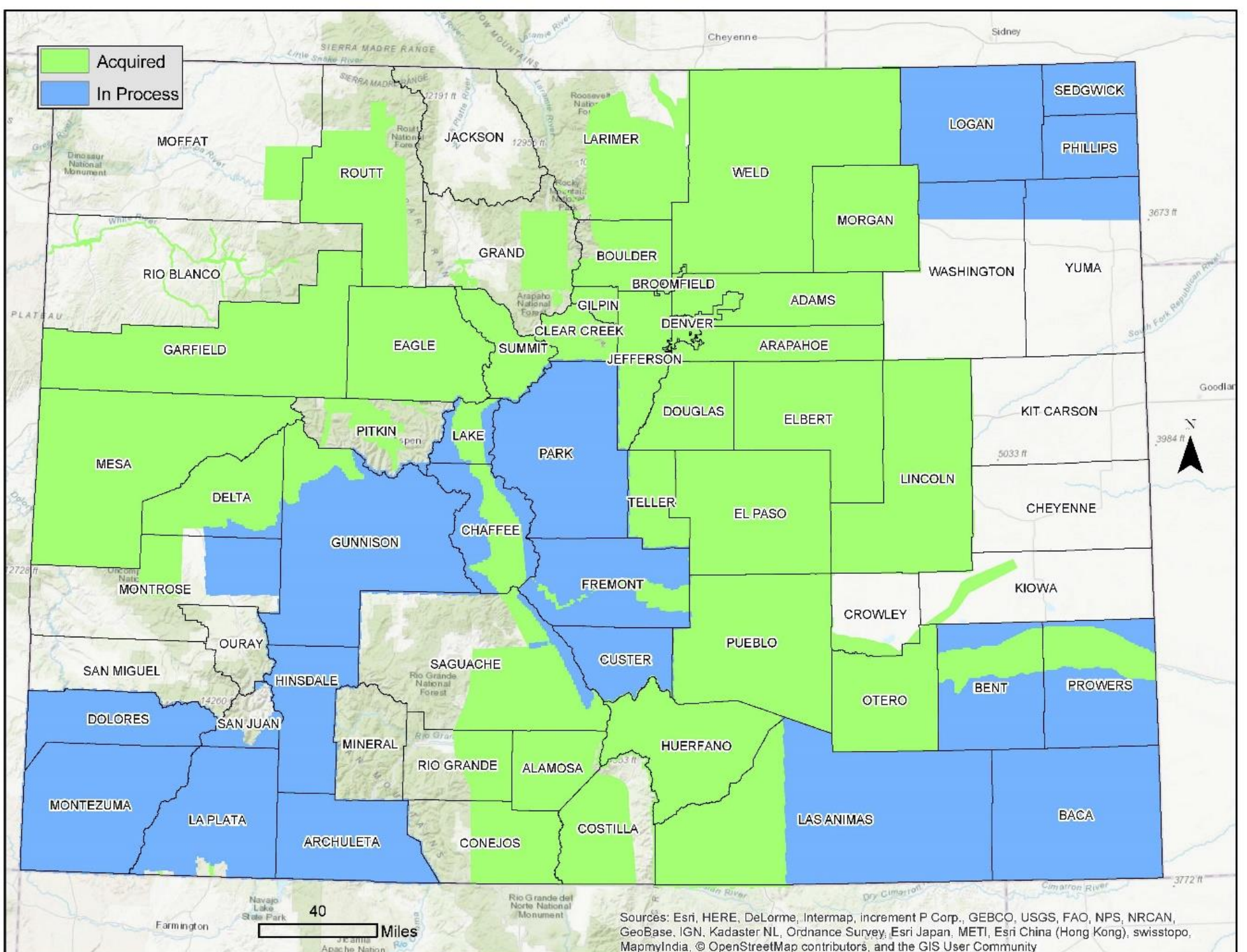


STRUCTURES AT RISK



**COORDINATED
NEEDS
MANAGEMENT
STRATEGY (CNMS)**

LiDAR Status in Colorado



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Overall FIRM Population Structures At Risk

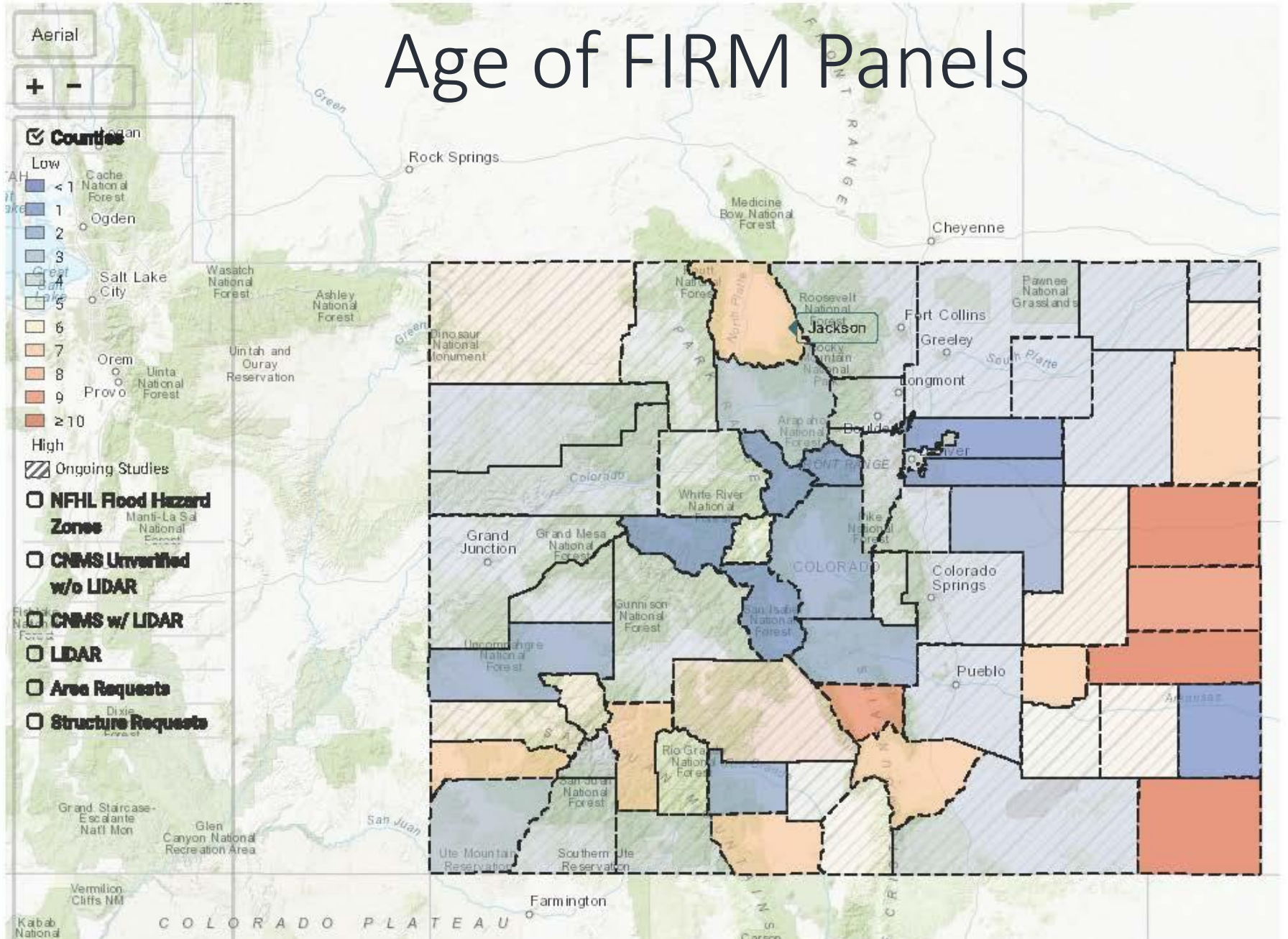
Growth 2020 Stream Miles CNMS

FIRM Scoring

Score	Min (≥)	Max (<)
10	0	1974
9	1974	1979
8	1979	1984
7	1984	1989
6	1989	1994
5	1994	1999
4	1999	2004
3	2004	2009
2	2009	2014
1	2014	2019
Reset FIRM Scoring		

County	FIRM	Score
Baca	0	10
Kiowa	0	10
Kit Carson	0	10
Cheyenne	1974	9
Custer	1978	9
Saguache	1976	9

Age of FIRM Panels



Overall FIRM Population Structures At Risk

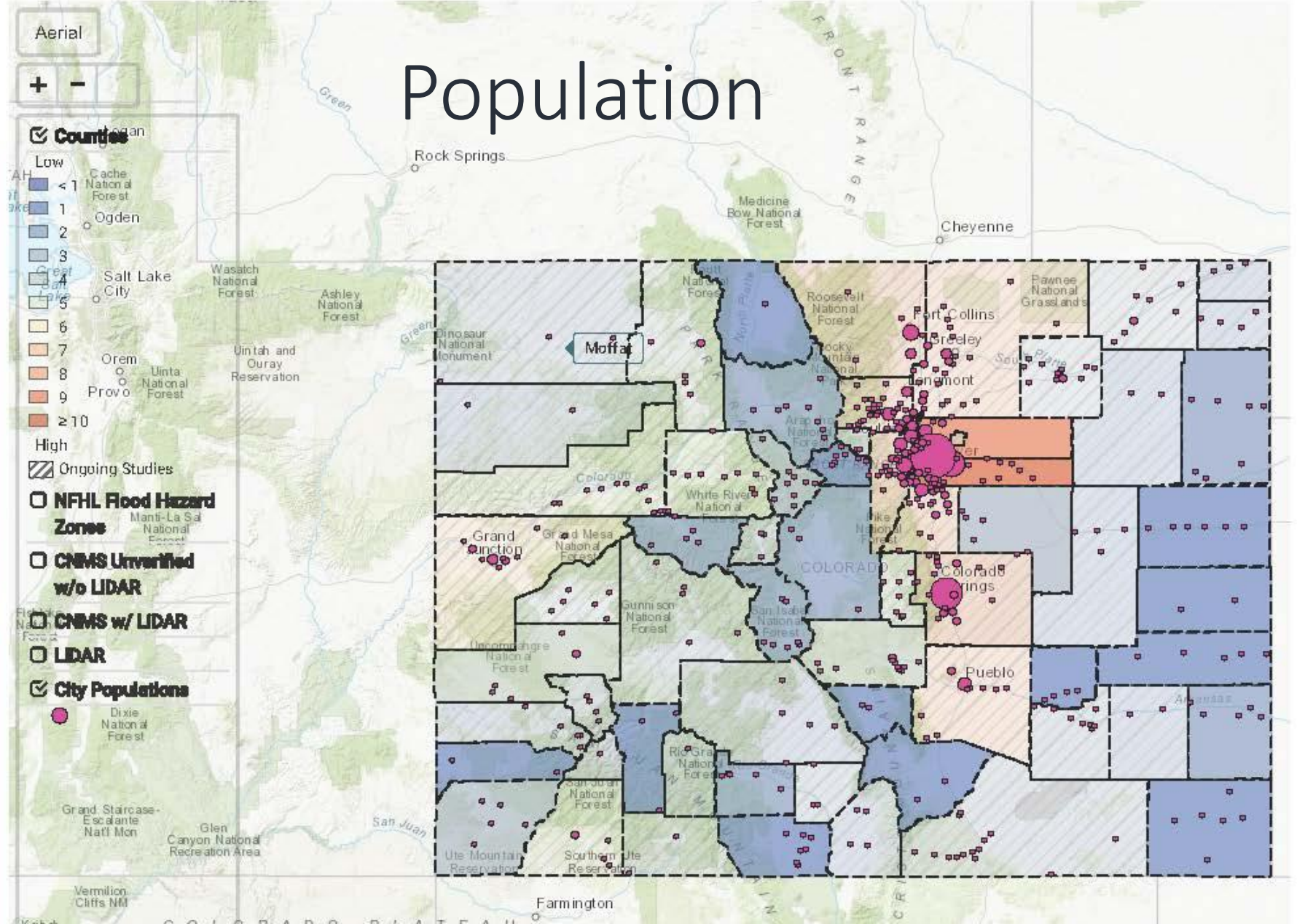
Growth 2020 Stream Miles CNMS

Population Scoring

Score	Min (≥)	Max (<)
1	0	10000
2	10000	20000
3	20000	40000
4	40000	60000
5	60000	80000
6	80000	100000
7	100000	150000
8	150000	300000
9	300000	500000
10	500000	1000000

Reset Population Scoring

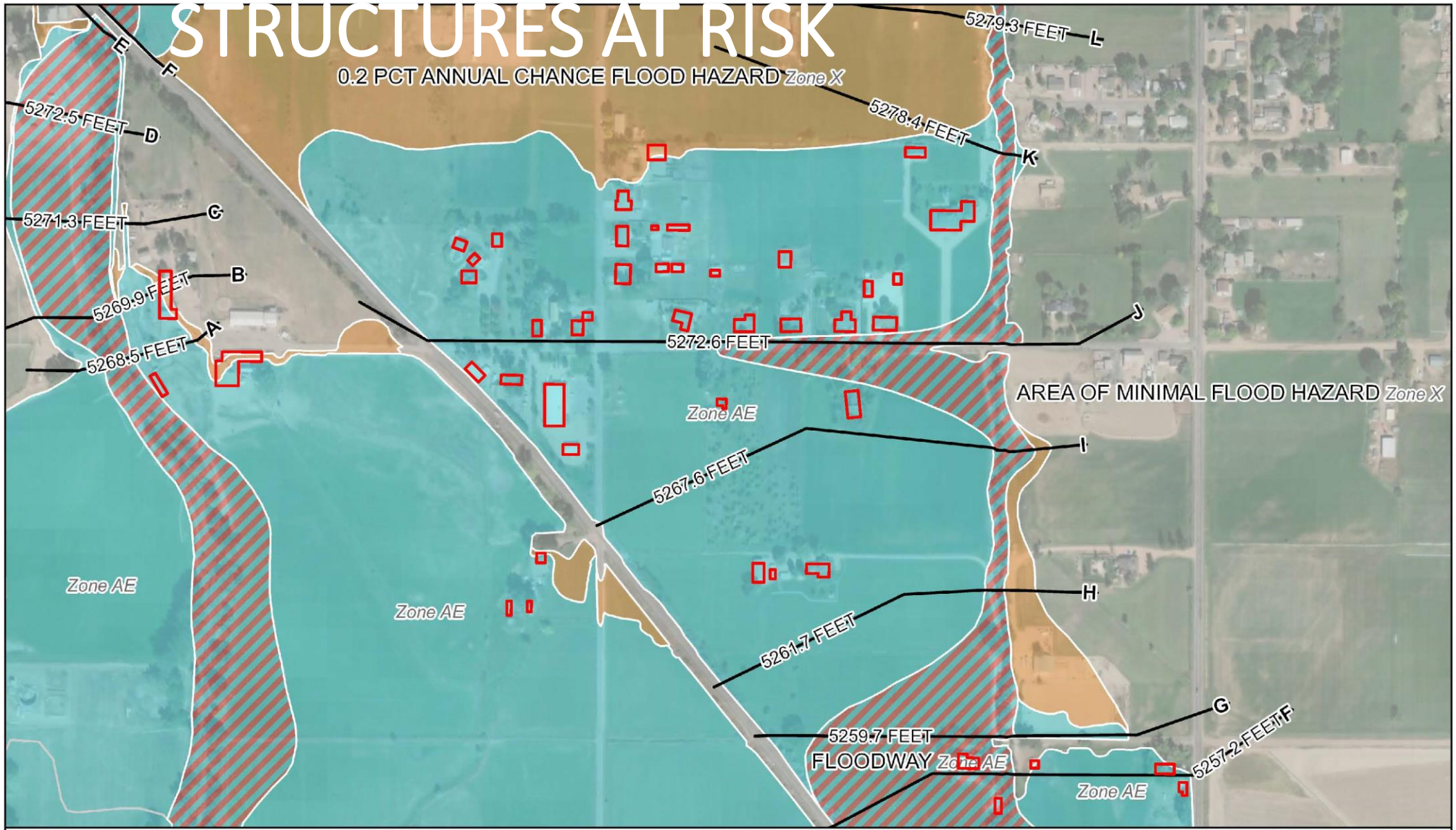
County	Population	Score
Arapahoe	630,000	10
Denver	683,000	10
El Paso	674,000	10
Jefferson	565,000	10
Adams	491,000	9
Boulder	319,000	9



Population

STRUCTURES AT RISK


0.2 PCT ANNUAL CHANCE FLOOD HAZARD Zone X



County Study Prioritization
Structures At Risk



AECOM

 Structures in SFHA

NFHL Layer
1% Annual Chance Flood Hazard
Regulatory Floodway
0.2% Annual Chance Flood Hazard

Overall FIRM Population Structures At Risk

Growth 2020 Stream Miles CNMS

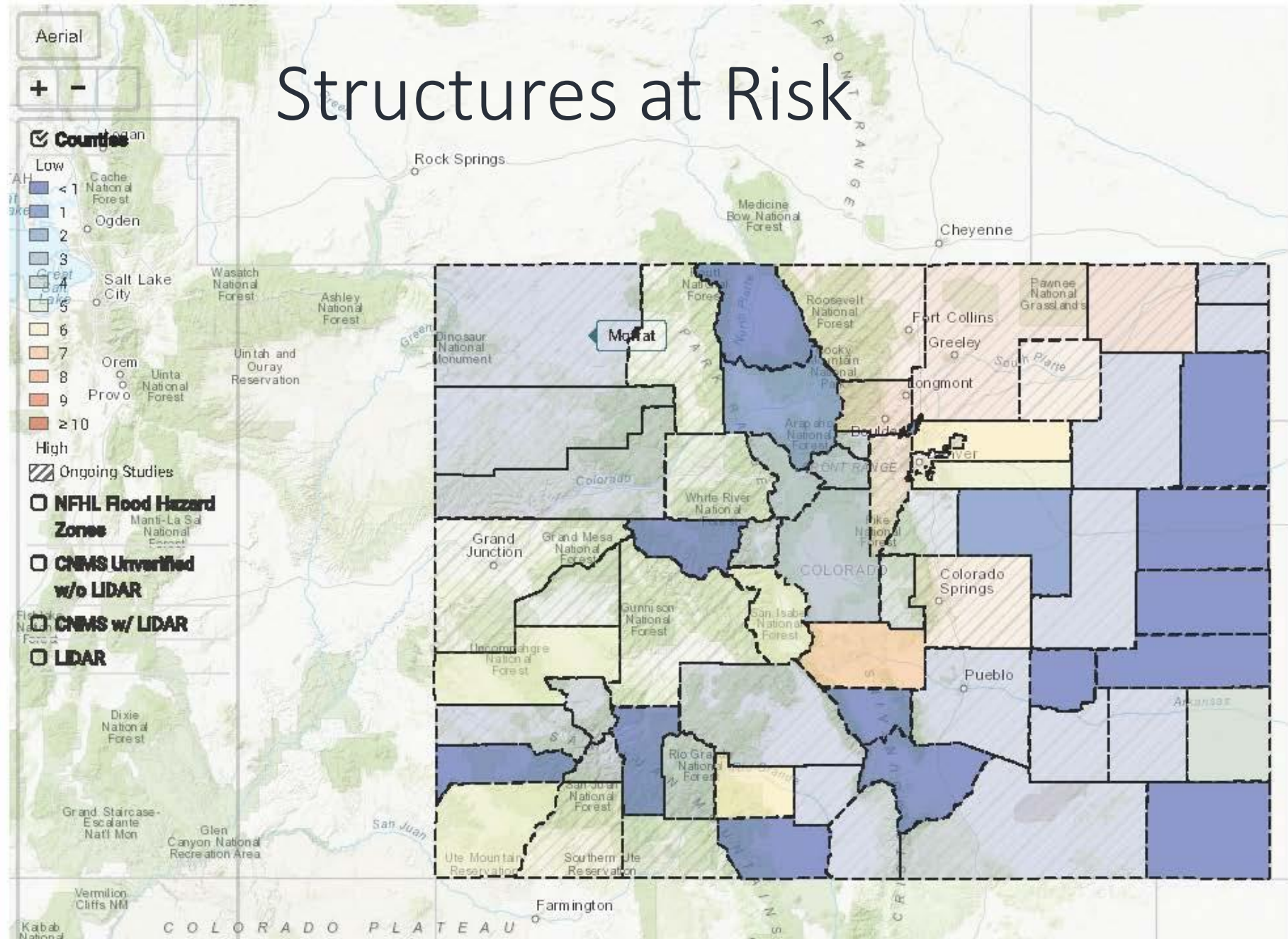
Structures At Risk Scoring

Data available only where digital floodplain data exists, counties with 0 structures may be missing digital floodplain data.

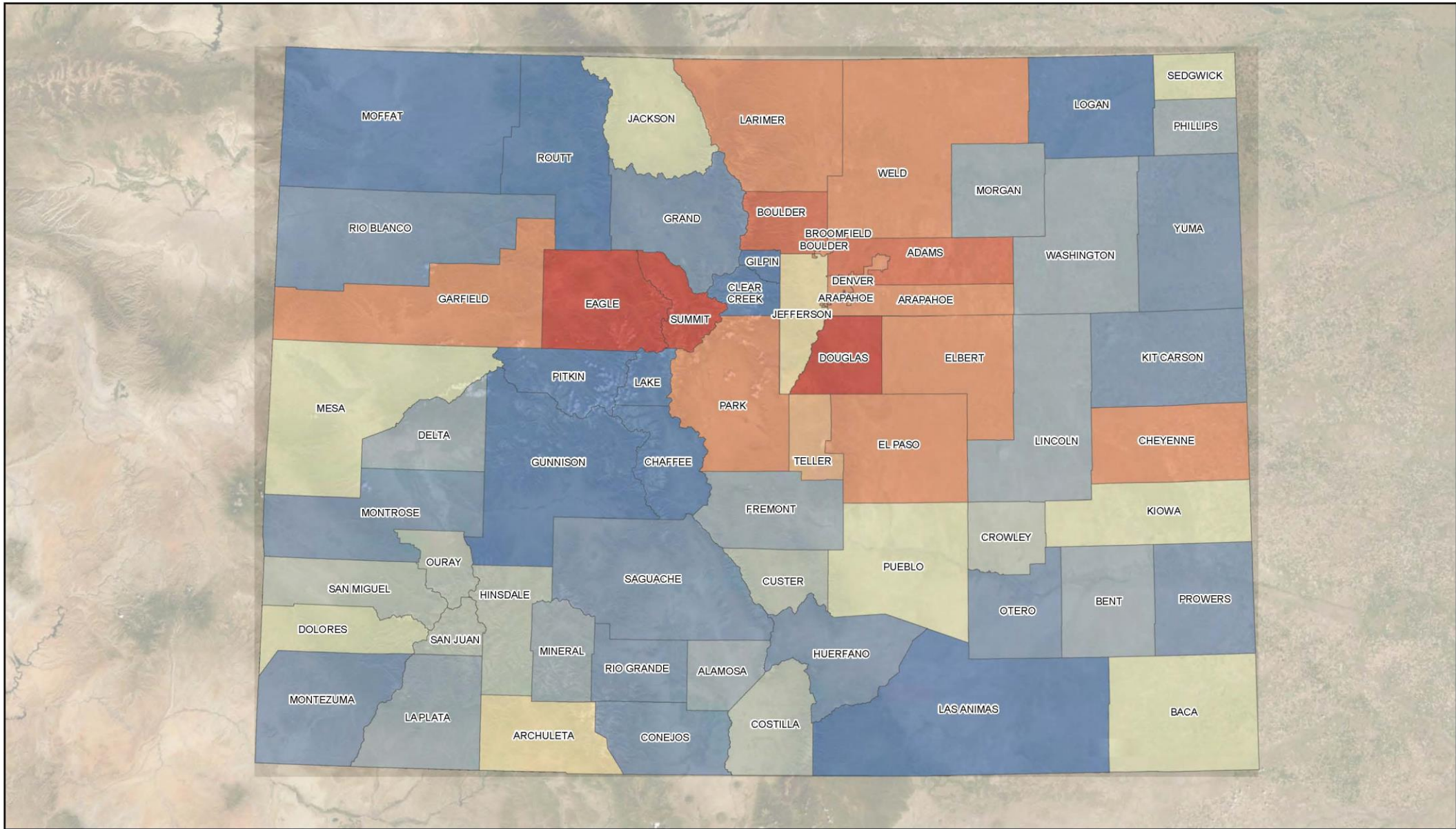
Score	Min (±)	Max (±)
0	0	100
1	100	200
2	200	300
3	300	400
4	400	500
5	500	1000
6	1000	2000
7	2000	3000
8	3000	4000
9	4000	5000
10	5000	10000

Reset Structures At Risk Scoring

County	Structures At Risk	Score
Boulder	4,243	9
Logan	4,080	9
Jefferson	3,018	8
Weld	3,746	8



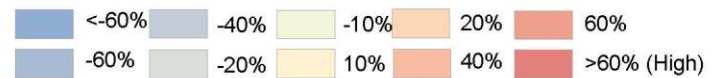
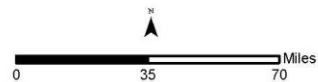
Structures at Risk



County Study Prioritization
ICLUS Population Growth Rate 2020 - 2050



AECOM



Overall FIRM Population Structures At Risk

Growth 2020 Stream Miles CNMS

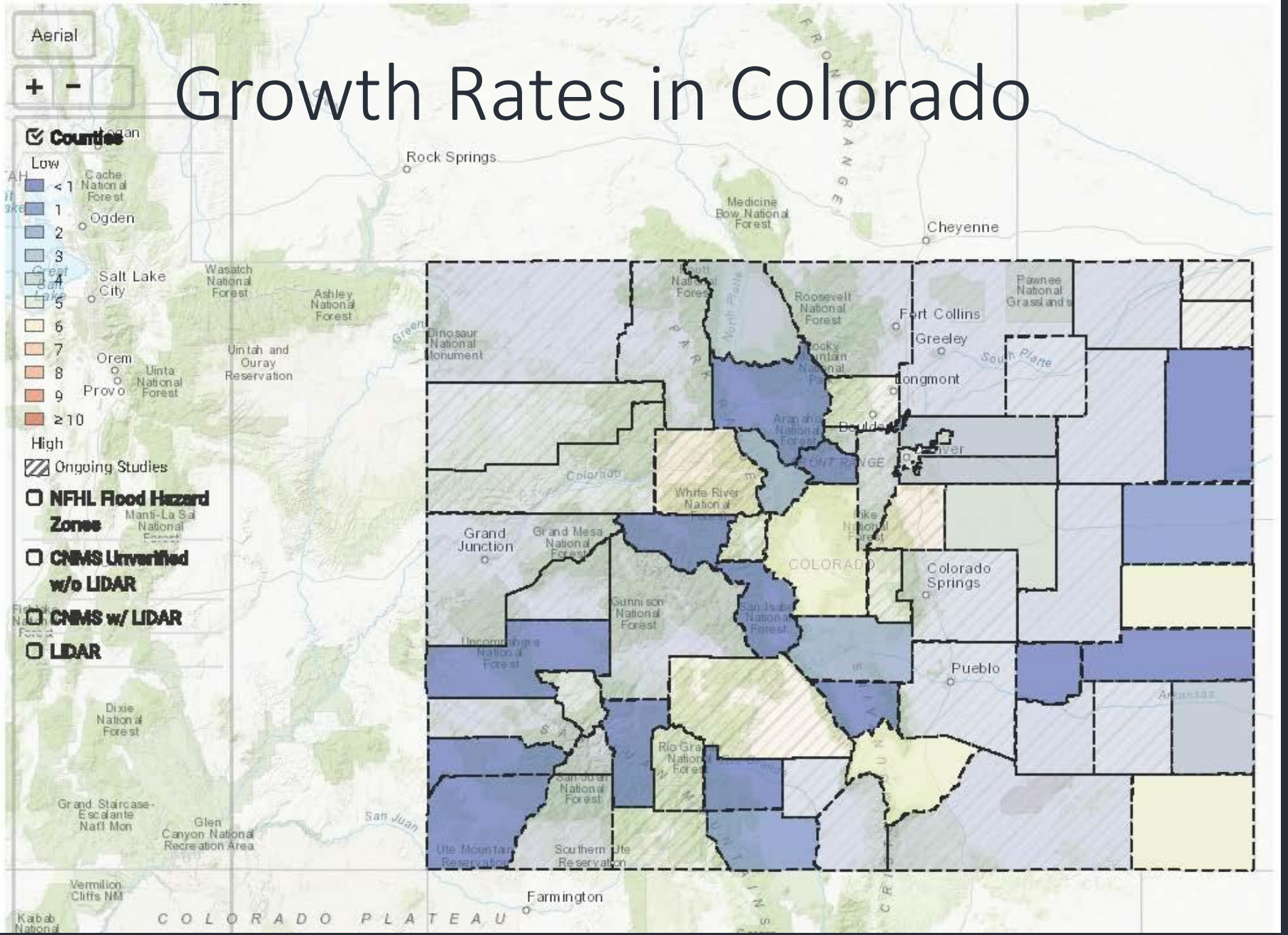
Growth Scoring 2020

For Year: 2020 ▾

Score	Min (≥)	Max (<)
0	-100	0
1	0	5
2	5	10
3	10	15
4	15	25
5	25	35
6	35	50
7	50	65
8	65	80
9	80	95
10	95	1000

Reset Growth Scoring

County	Growth	Score
Douglas	59.60%	7
Eagle	54.07%	7
Saguache	35.05%	6
Baca	30.90%	5
Cheyenne	25.78%	5



Growth Rates in Colorado

[Overall](#) [FIRM](#) [Population](#) [Structures At Risk](#)

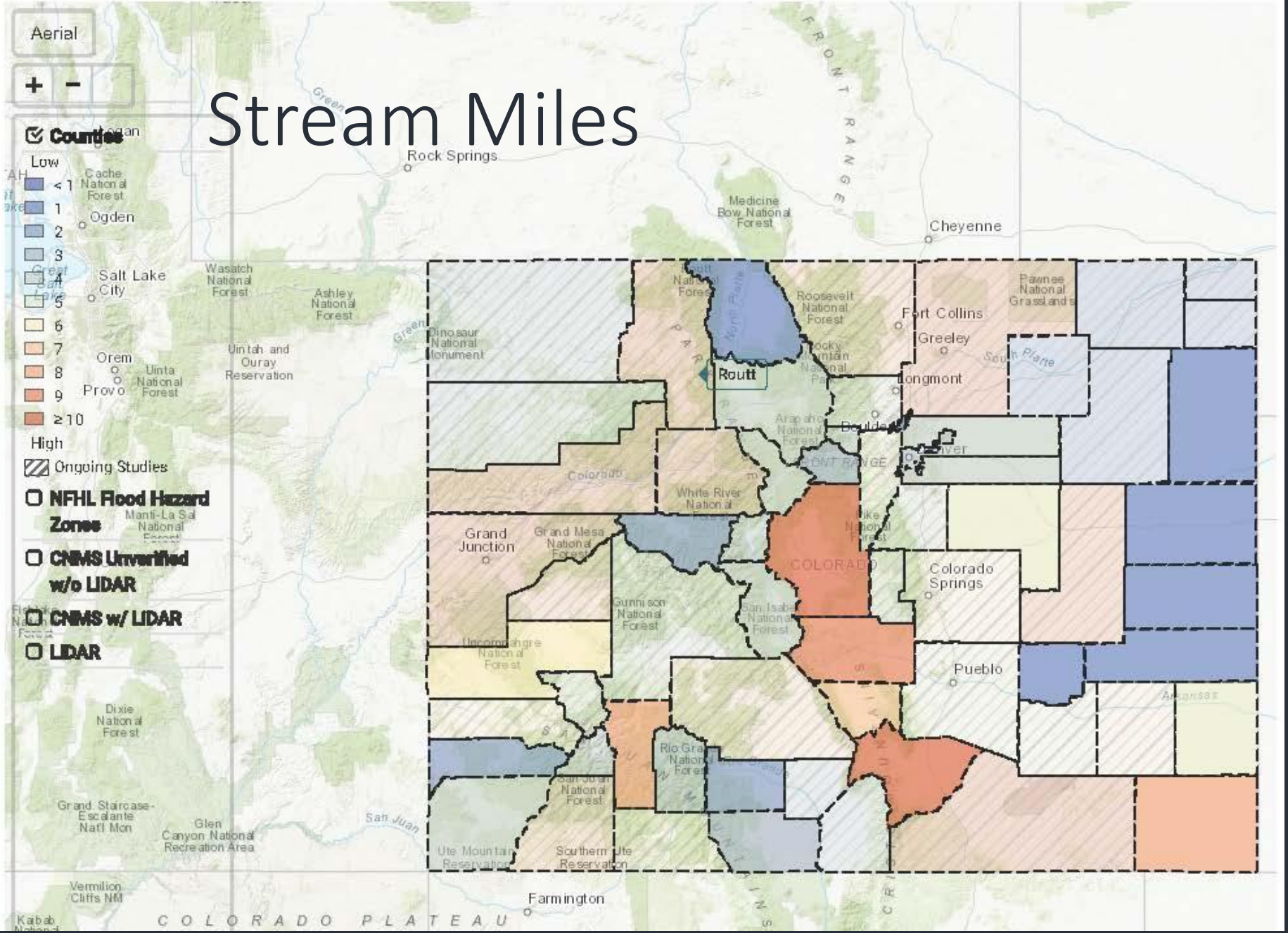
[Growth 2020](#) [Stream Miles](#) [CNMS](#)

Stream Miles Scoring

Score	Min (≥)	Max (<)
1	0	100
2	100	200
3	200	300
4	300	400
5	400	500
6	500	600
7	600	700
8	700	800
9	800	900
10	900	20000

Reset Stream Miles Scoring

County	Stream Miles	Score
Eagle	1,055	10
Garfield	1,483	10
Huerfano	1,004	10
Las Animas	1,743	10
Mesa	1,855	10
Park	1,249	10



[Overall](#) [FIRM](#) [Population](#) [Structures At Risk](#)

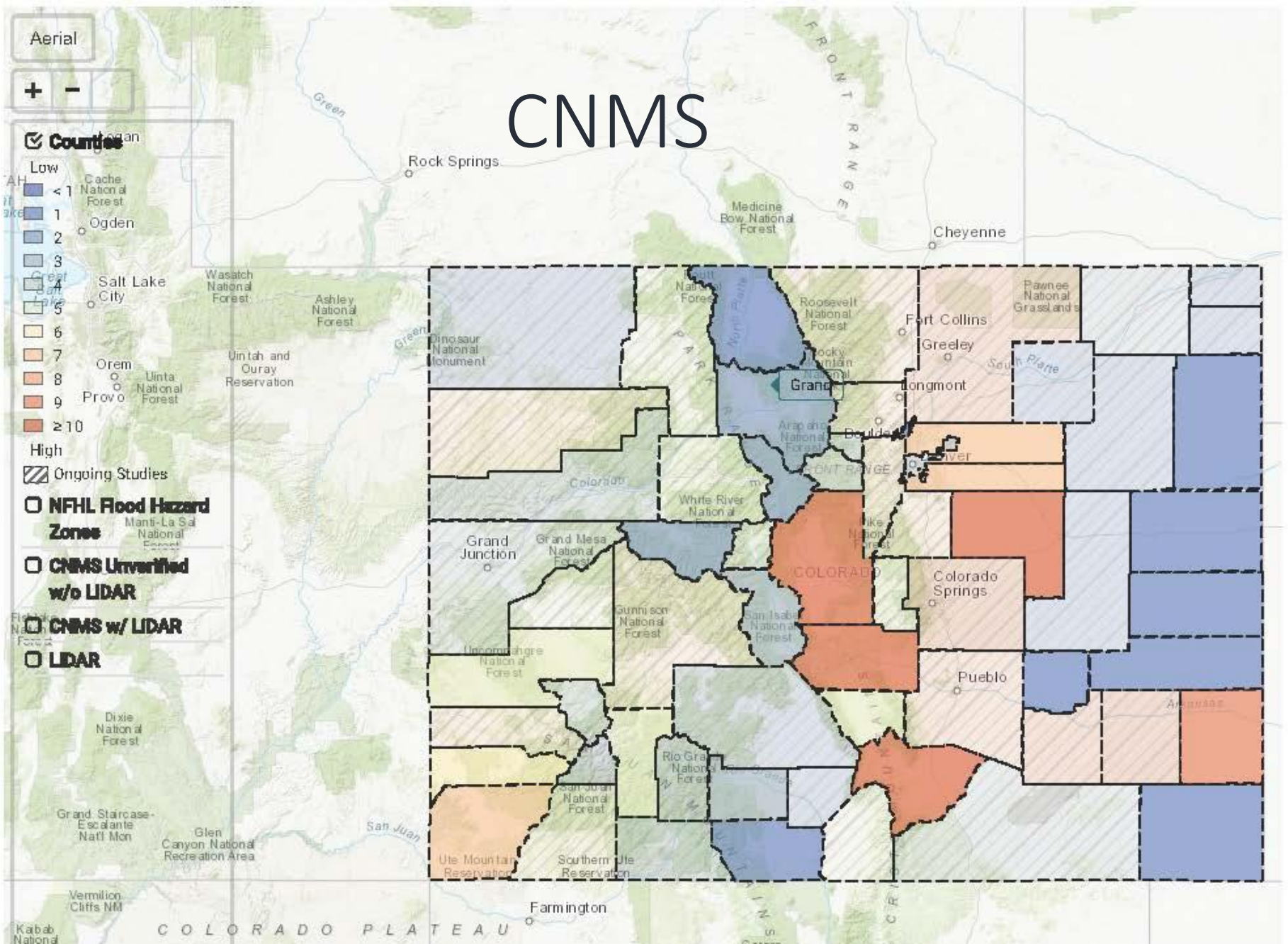
[Growth 2020](#) [Stream Miles](#) [CNMS](#)

CNMS Scoring

Score	Min (≥)	Max (<)
1	0	30
2	30	60
3	60	80
4	80	100
5	100	150
6	150	200
7	200	300
8	300	400
9	400	500
10	500	10000

Reset CNMS Scoring

County	CNMS	Score
Bent	605.448	10
El Paso	753.088	10
Elbert	591.449	10
Fremont	583.823	10
Huerfano	513.549	10
Park	617.119	10



Weighting Factors



County	Overall Score
Huerfano	10
El Paso	9
Weld	9
Fremont	8
Larimer	8
Park	8
Adams	7
Arapahoe	7
Baca	7
Bent	7

County Stats

El Paso

FIRM Status	2018
FIRM Status Score	1
Structures At Risk	2,828
Structures At Risk Score	7
Population	674,000
Population Score	10
Estimated 2020 Population	692,419
Estimated 2020 Population Growth	2.733
Estimated 2020 Population Growth Score	1
Estimated 2025 Population	729,817
Estimated 2025 Population Growth	8.281
Estimated 2025 Population Growth Score	2
Estimated 2030 Population	764,217
Estimated 2030 Population Growth	13.385
Estimated 2030 Population Growth Score	3
Estimated 2035 Population	795,233
Estimated 2035 Population Growth	17.987
Estimated 2035 Population Growth Score	4

CNMS Miles	987.798
Verified CNMS	225
Unverified CNMS	759.146
Unverified wLiDAR	753.088
CNMS Score	10
State Stream Miles	881
Federal Stream Miles	95
Streams-FedLand-CNMS (Verified) With LiDAR	561
Stream Miles	6
Total Score	115.1
Overall Priority	9



Overall FIRM Population Structures At Risk

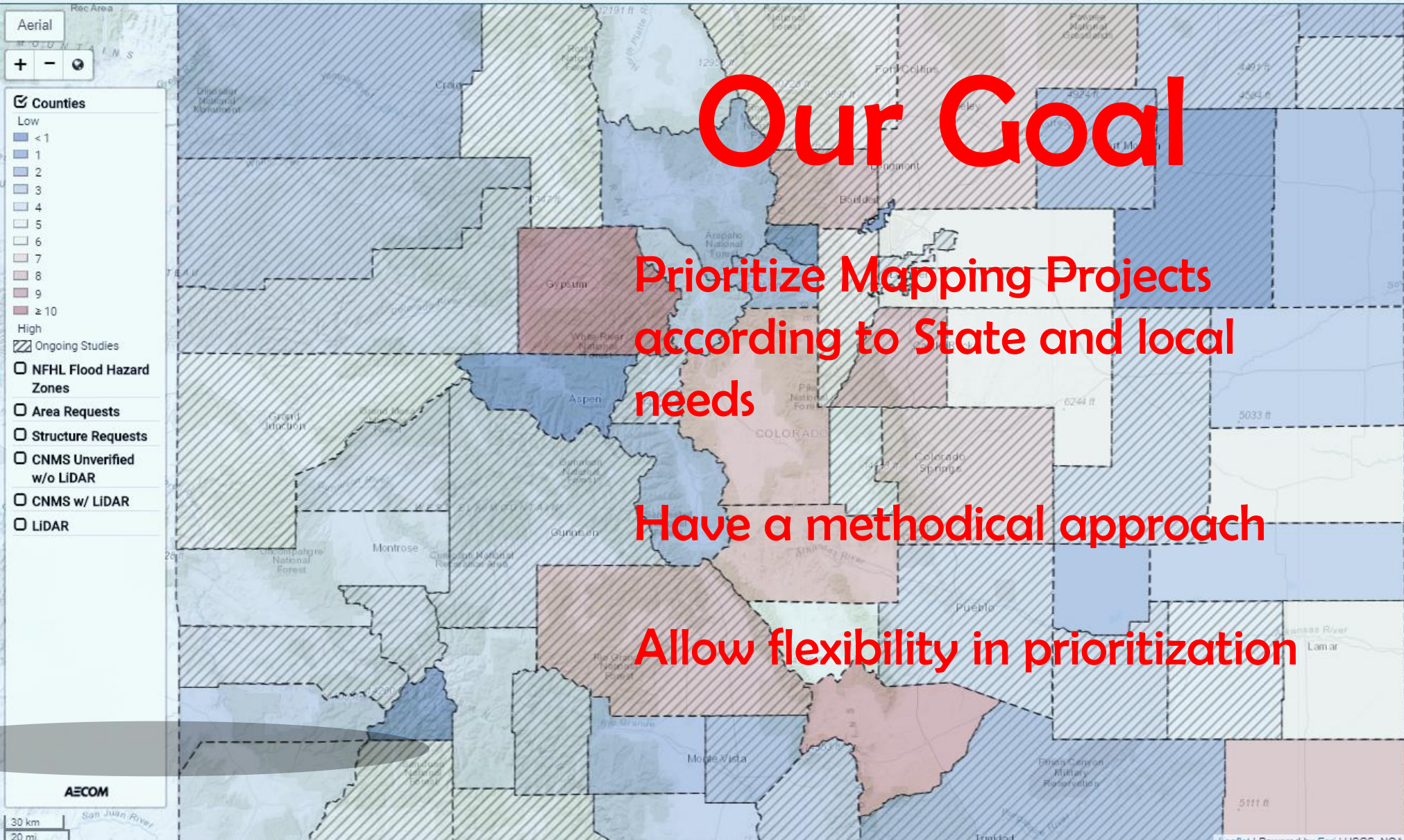
Growth 2020 Stream Miles CNMS

Parameter Weights



Reset Parameter Weights

County	Overall Score
Eagle	10
Huerfano	9
Baca	8
Boulder	8
Douglas	8
Fremont	8
Park	8
Saguache	8
El Paso	7
Weld	7
Adams	6
Arapahoe	6
Cheyenne	6
Elbert	6



Our Goal

Prioritize Mapping Projects according to State and local needs

Have a methodical approach

Allow flexibility in prioritization

Q & A



Check us out at www.coloradohazardmapping.com or cwcb.state.co.us



Like us on Twitter and Facebook



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303-866-3441 ext. 3230