Esri Redistricting

Oregon House Redistricting Committee

April 8, 2021

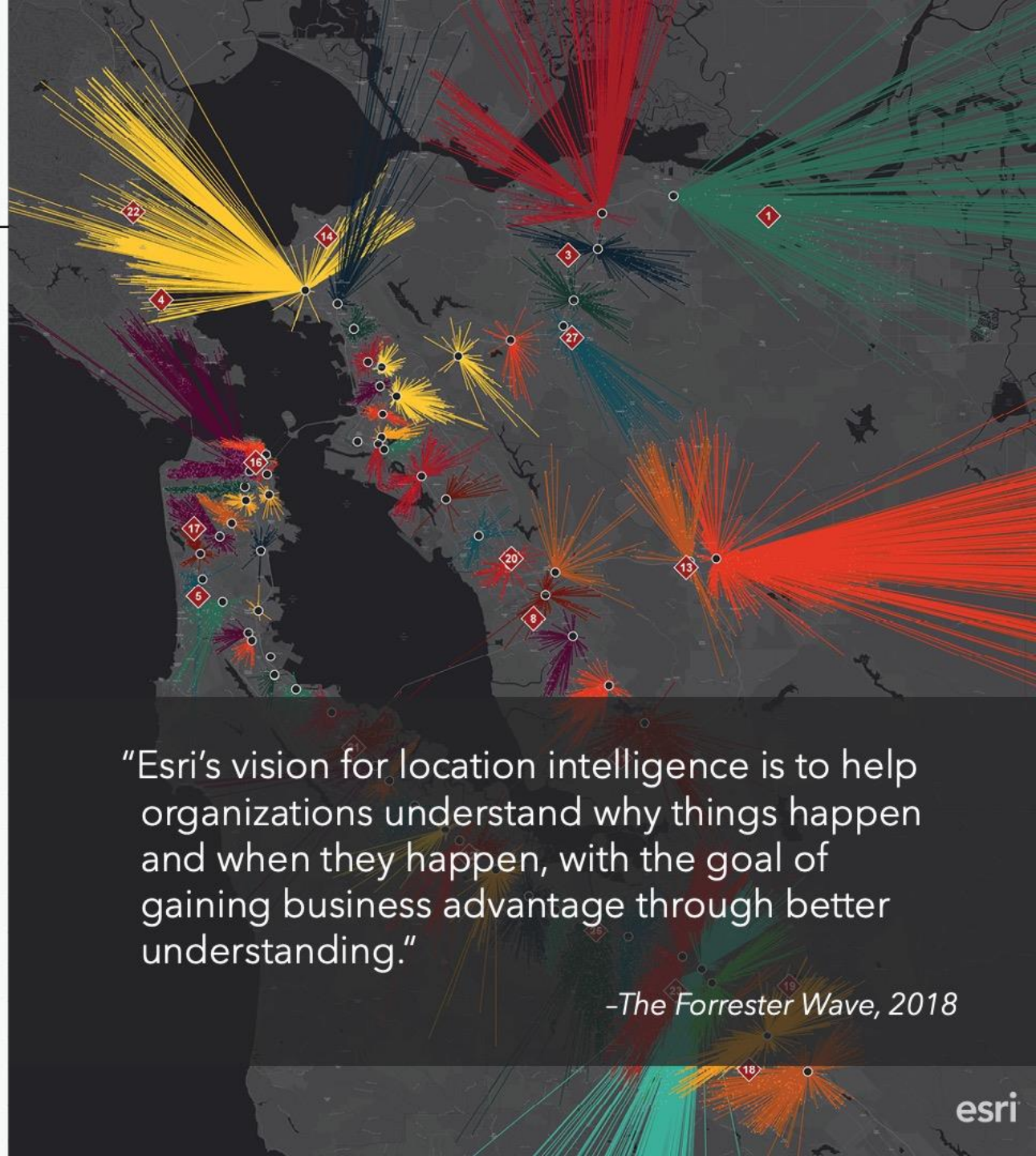
Agenda:

- Who we are.
- Our background in Redistricting.
- 2020 Census PL94-171 Data workflow.
- What does 2020 look like.
- Open questions and next steps.

WHO WE ARE

Esri is the **global leader** in geographic information systems (GIS) software, location intelligence, and mapping.

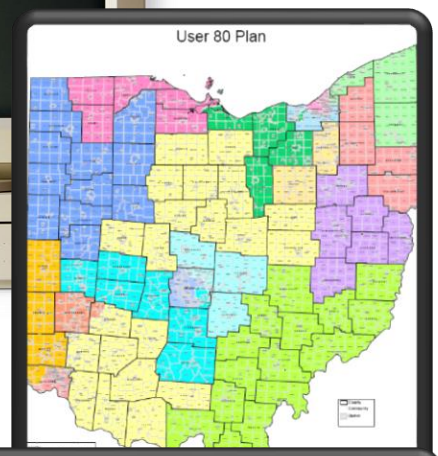
With more than **100** offices worldwide and professionals from **67** countries, Esri provides organizations of every size and industry the tools to get deeper insights from their geographic and transactional data to improve operational and business results.

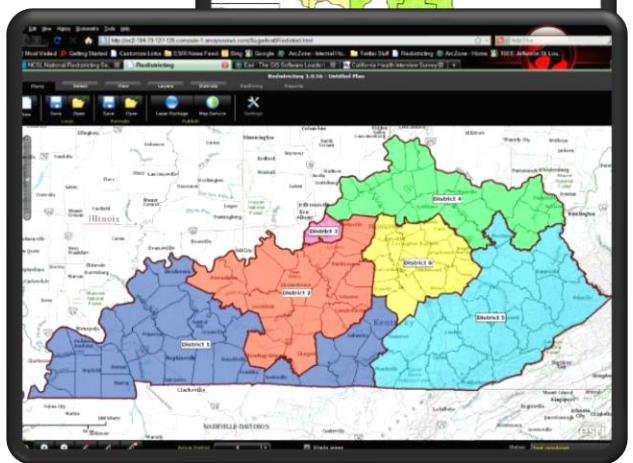


Redistricting Background

Some History:

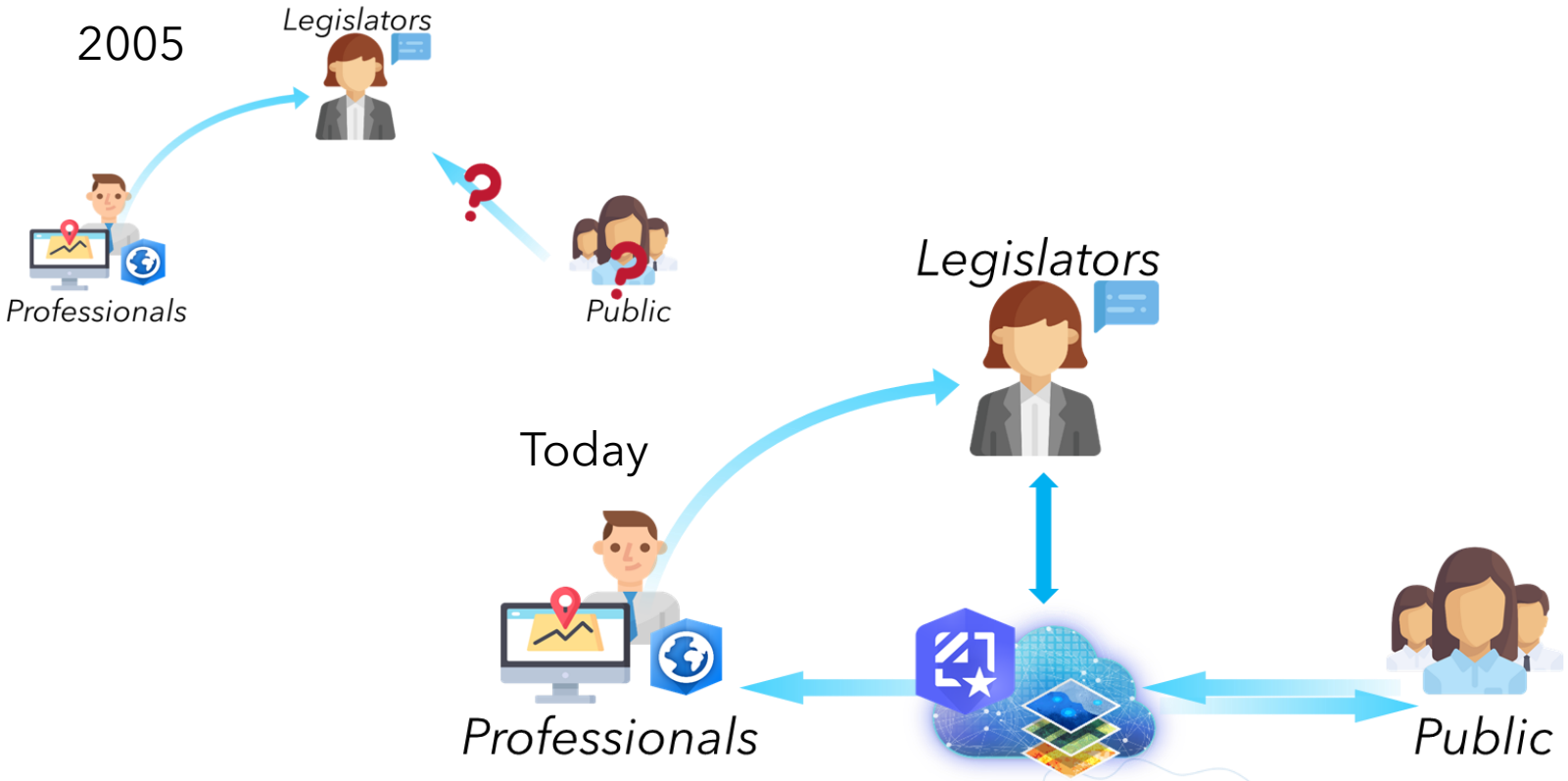
1980's	*Highly Constrained*
1990's	**Tools available but cumbersome**
2000's	**Usability and some public involvement**
2010's	**Almost consumer-level**





A Vision for 2010 Redistricting

Esri Redistricting Story

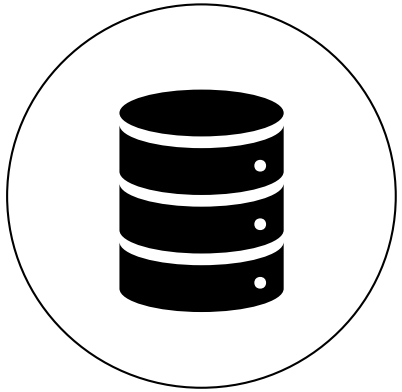


A browser approach would increase collaboration within the legislature and between citizens

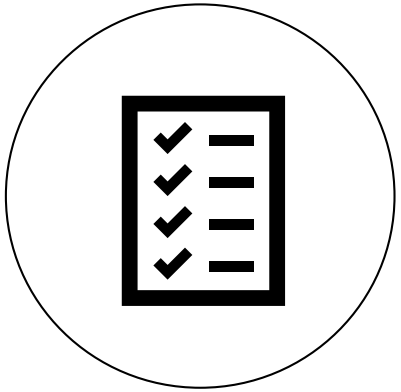
- Provided via web browser
- Facilitates collaboration, sharing, and community building
- Easy to use interface reduces costs associated with training
- Minimal GIS experience required
- Centralized IT
- Cost effective way to provide access to citizens

Features Overview

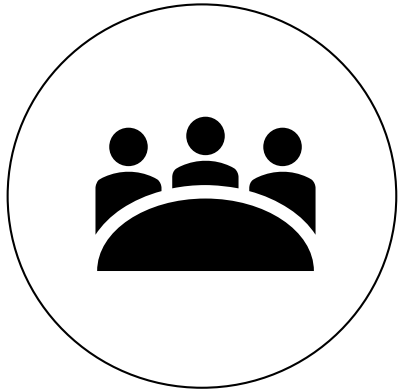
Esri Redistricting



Data Sources



Plan Management



Collaboration

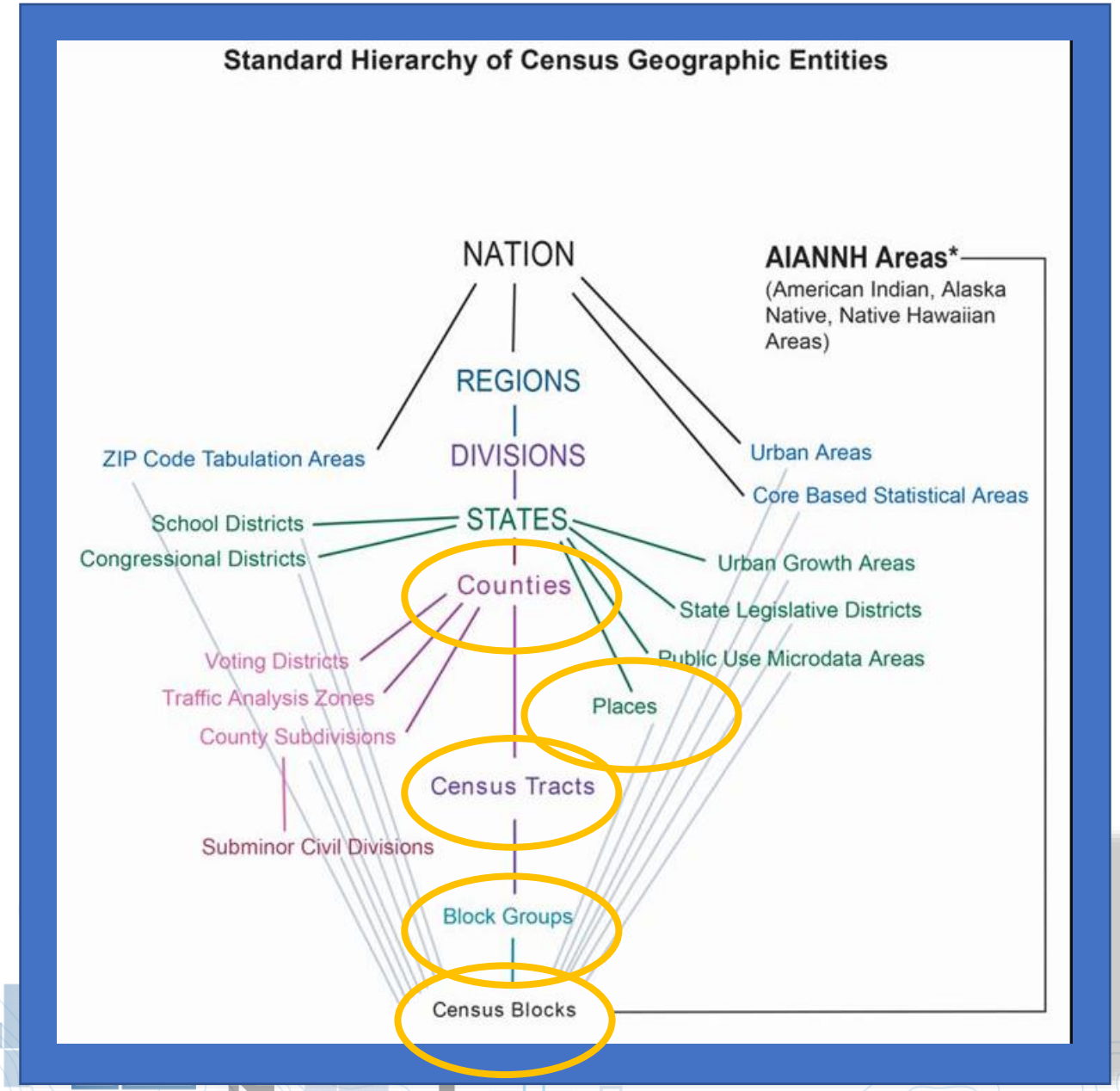
Census Data—The P.L. Story

Public Law (P.L.) 94-171

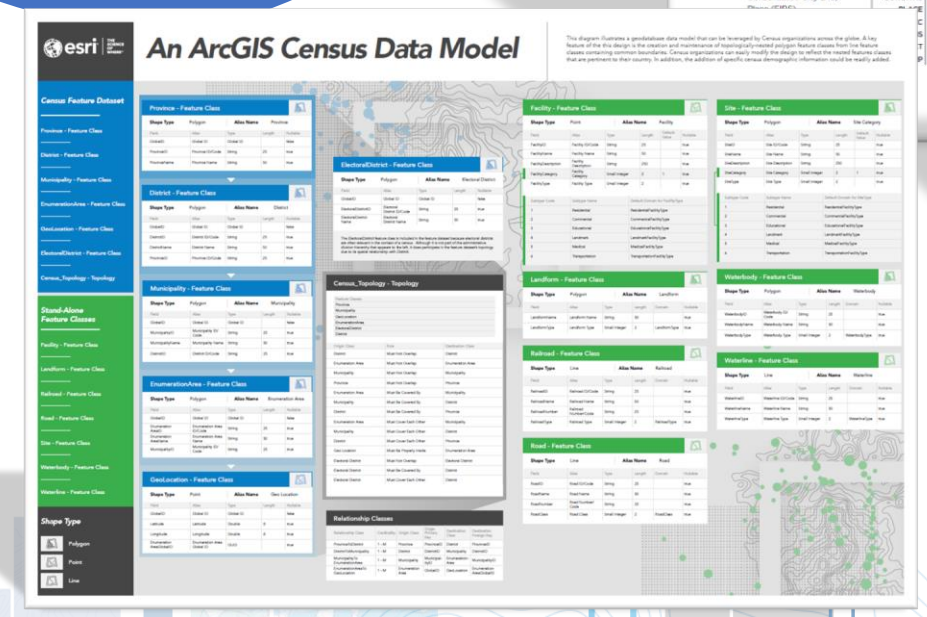
…enacted by Congress in December 1975, requires the Census Bureau to provide states the opportunity to identify the small area geography for which they need data in order to conduct legislative redistricting. The law also requires the U.S. Census Bureau to deliver this data no later than one year from Census day.

P.L. 94-171 requires the U.S. Census Bureau to furnish "basic tabulations of population" to each state, including for those small areas the states have identified.

Understanding Geographic Relationships: Counties, Places, Tracts and More (census.gov)



The P.L. table as a Data Model.



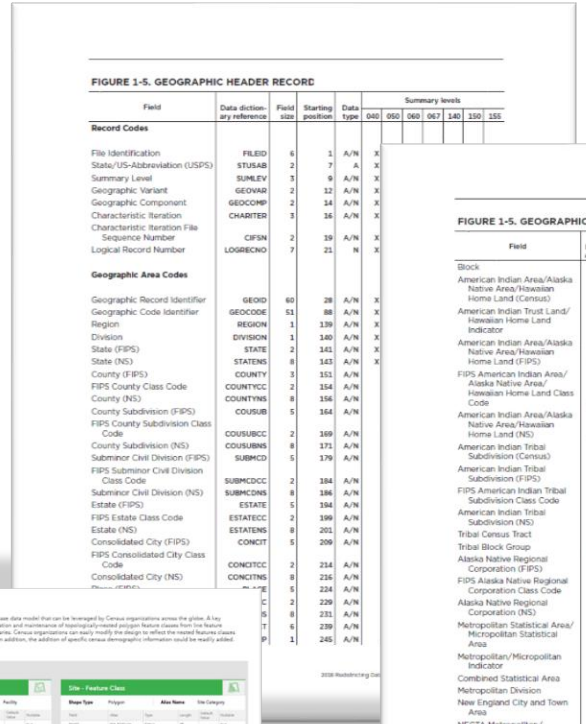


FIGURE 1-5. GEOGRAPHIC HEADER RECORD

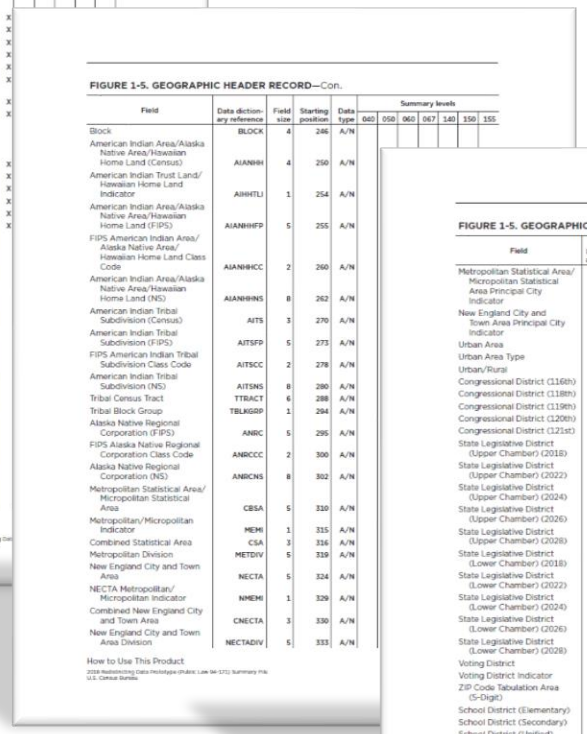
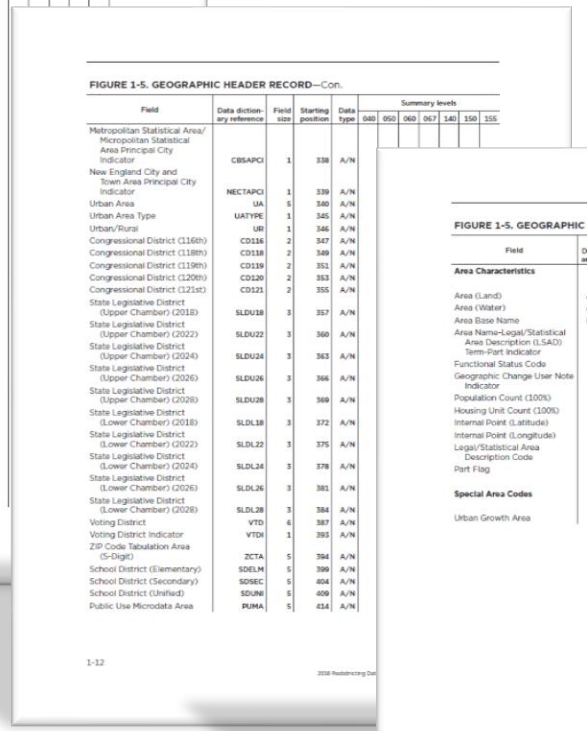


FIGURE 1-5. GEOGRAPHIC HEADER RECORD—Con.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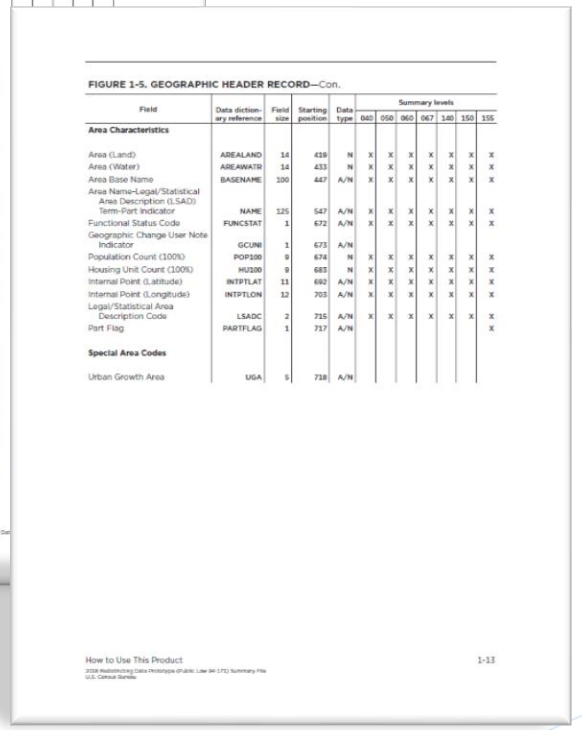
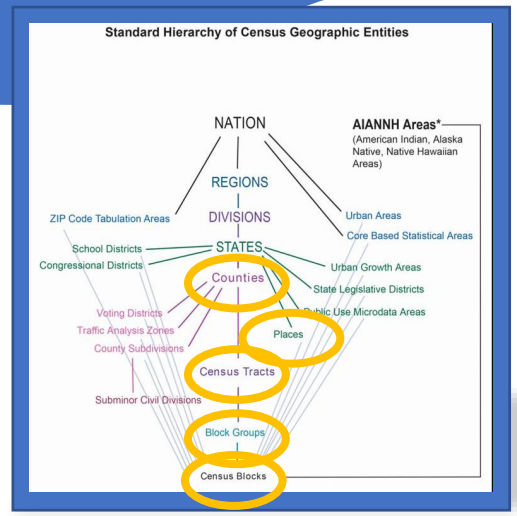


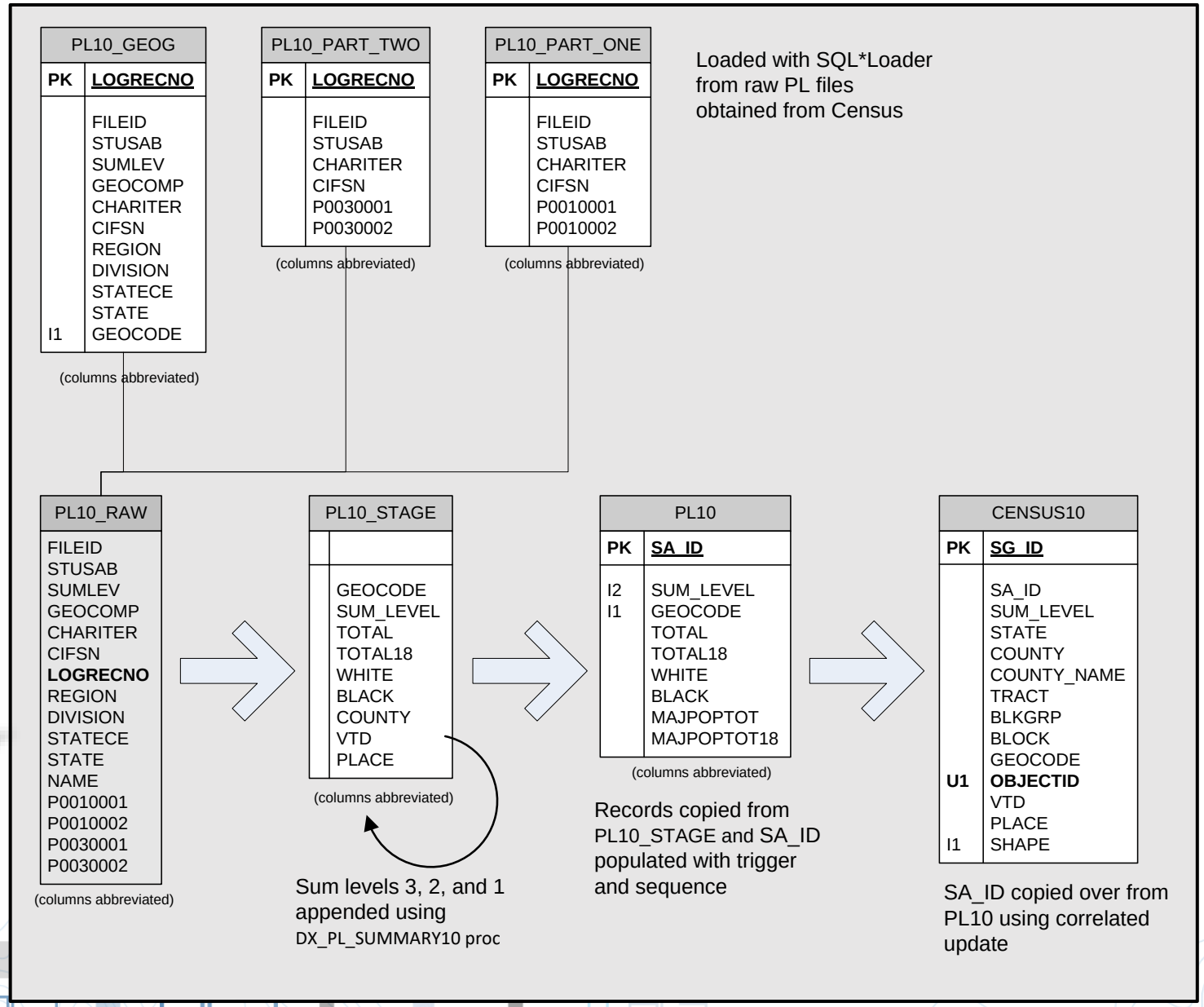
FIGURE 1-5. GEOGRAPHIC HEADER RECORD—Con.

How the P.L. table is populated.

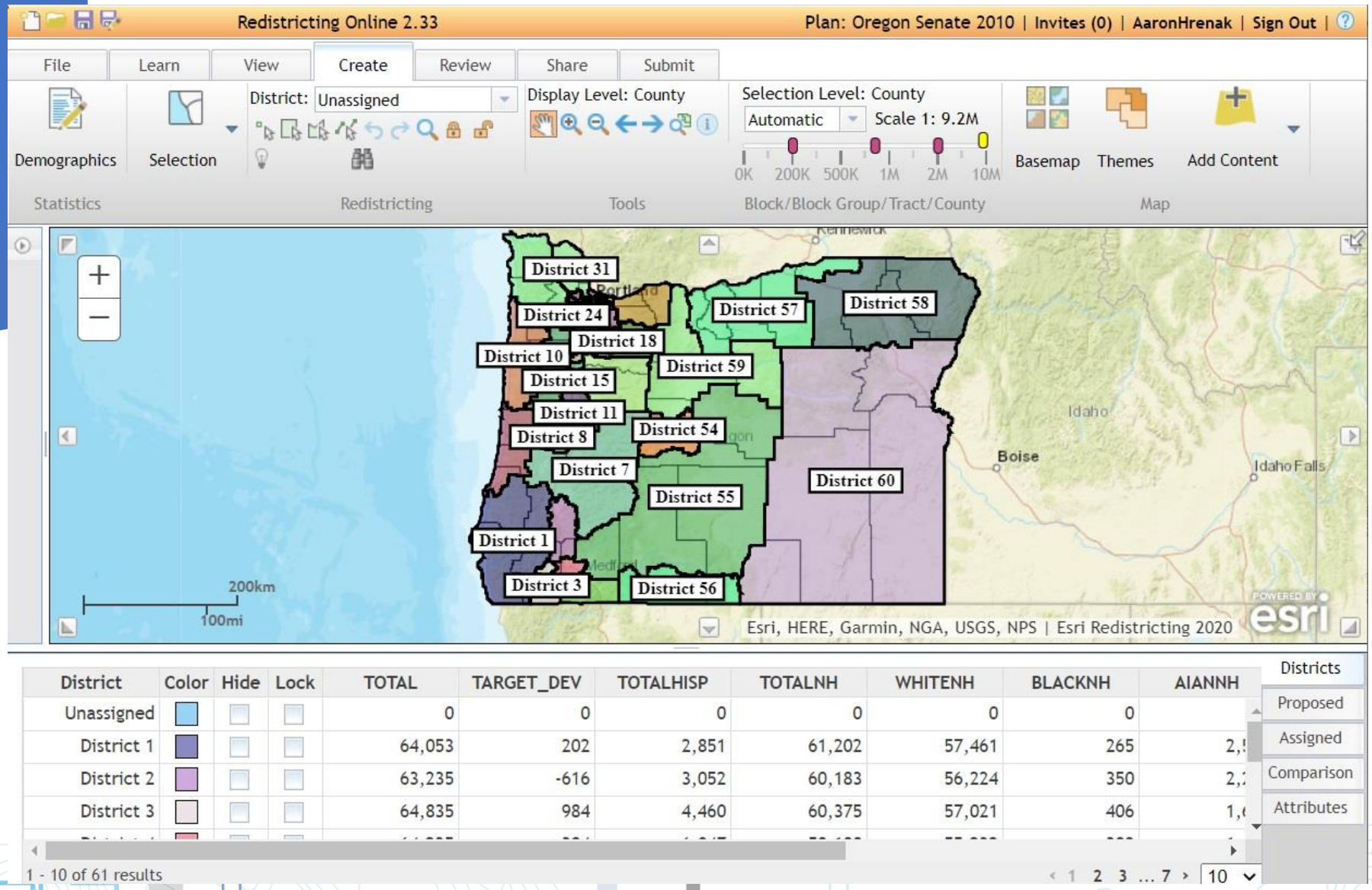
	Steps for processing 2020 Census P.L. data
1.	Download 2020 Census PL94-171 data from Census Bureau
2.	PL data is loaded into staging database, the separate parts are joined into a singular table
3.	Summarization of all relevant attributes is performed per hierarchy (block, block group, tract, county, place, voting district)
4.	Summary data is joined to corresponding geography
5.	Data is exported to file geodatabase for delivery to Product Team
6.	Modified Edges feature class added to each state file geodatabase
7.	ArcGIS Pro document created for each state
8.	Map Service published for each state
9.	App configuration file updated to include new service
10.	Software updated to latest build
11.	Regression testing performed
12.	Implementation coordination with customer

2020 Census P.L. data workflow



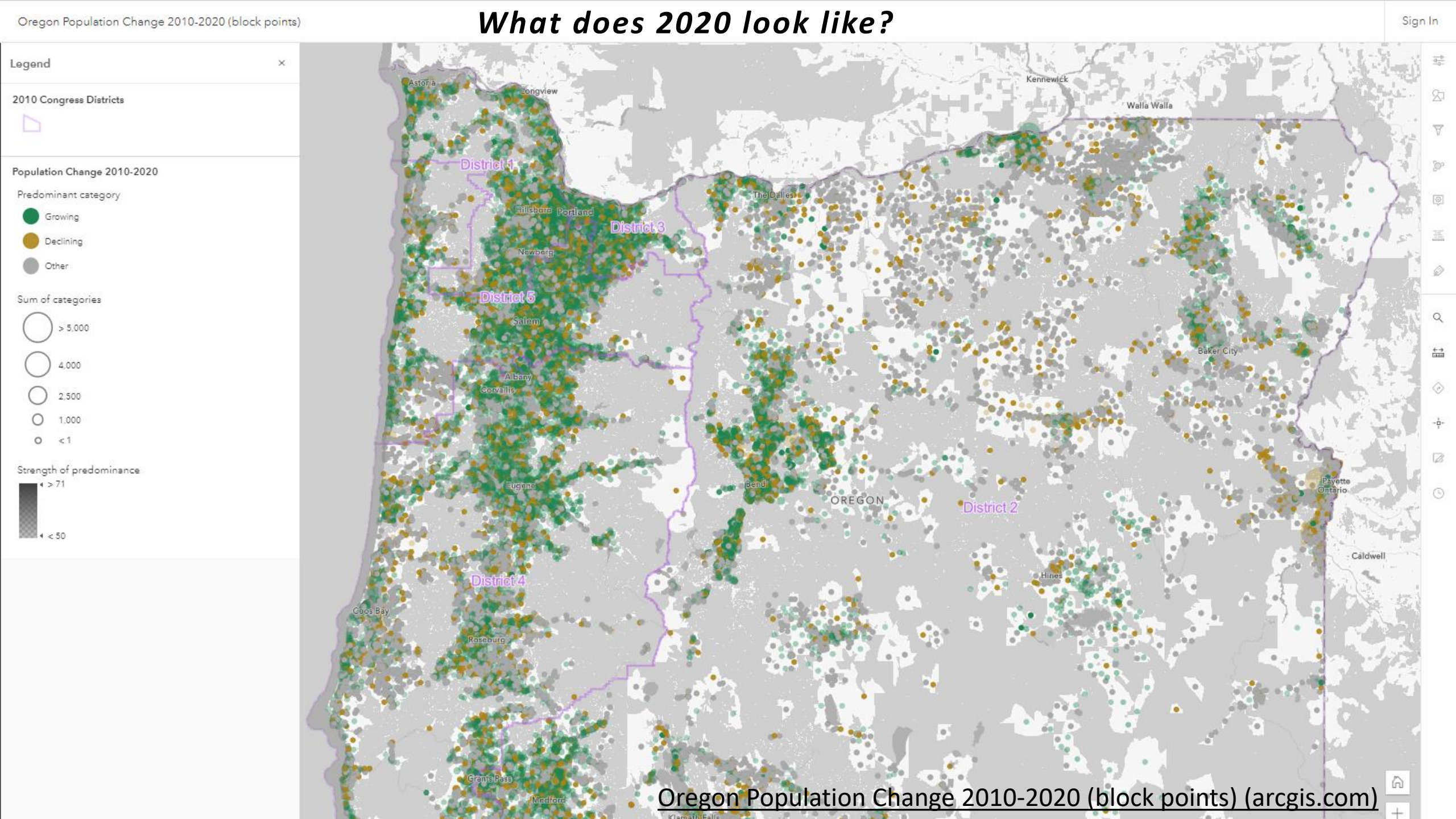


Oregon Senate Districts

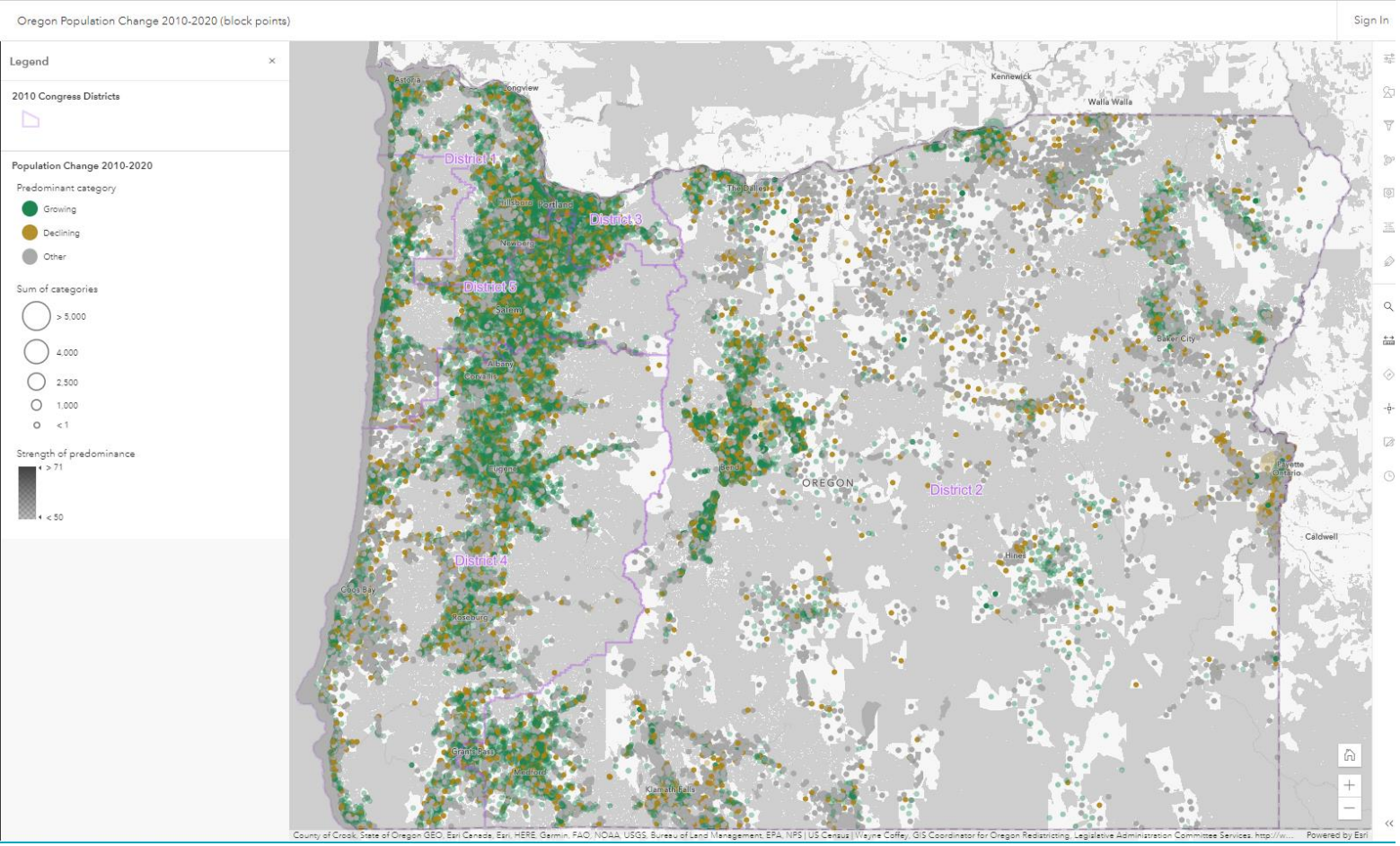


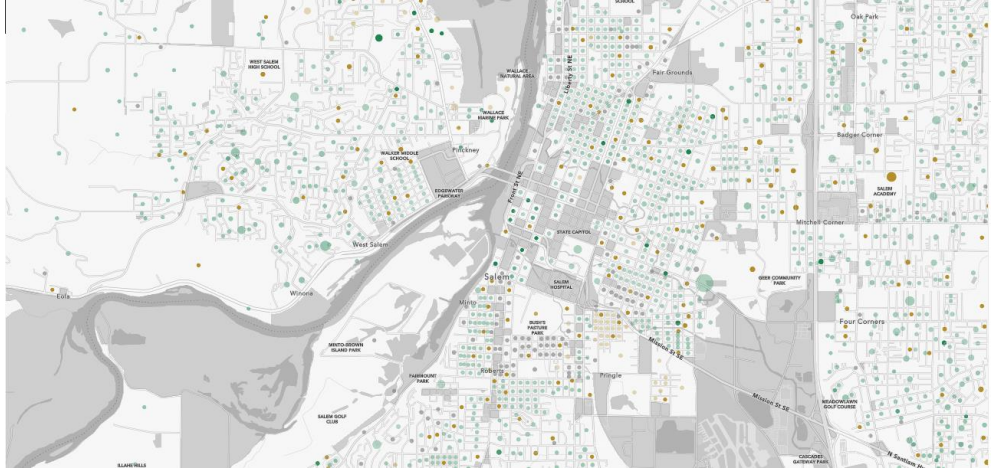
District	Color	Hide	Lock	TOTAL	TARGET_DEV	TOTALHISP	TOTALNH	WHITENH	BLACKNH	AIANNH
Unassigned				0	0	0	0	0	0	
District 1				64,053	202	2,851	61,202	57,461	265	2,!
District 2				63,235	-616	3,052	60,183	56,224	350	2,:
District 3				64,835	984	4,460	60,375	57,021	406	1,(

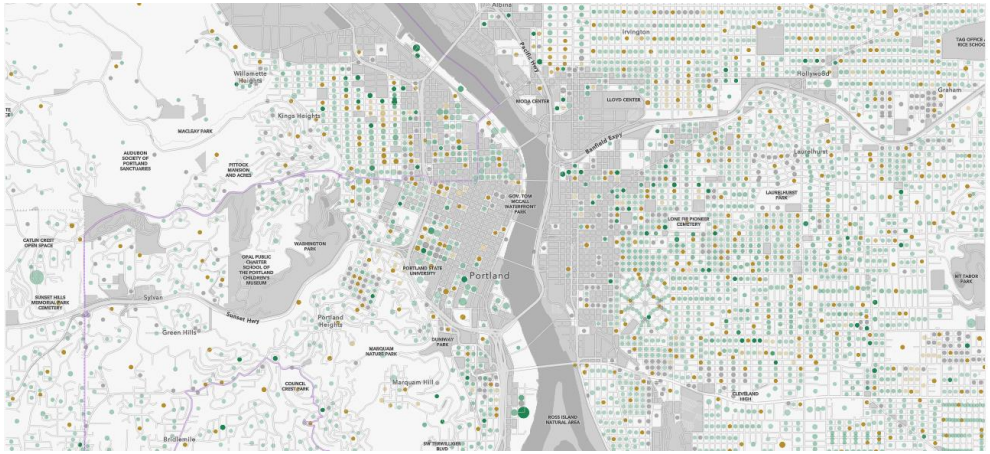
What does 2020 look like?

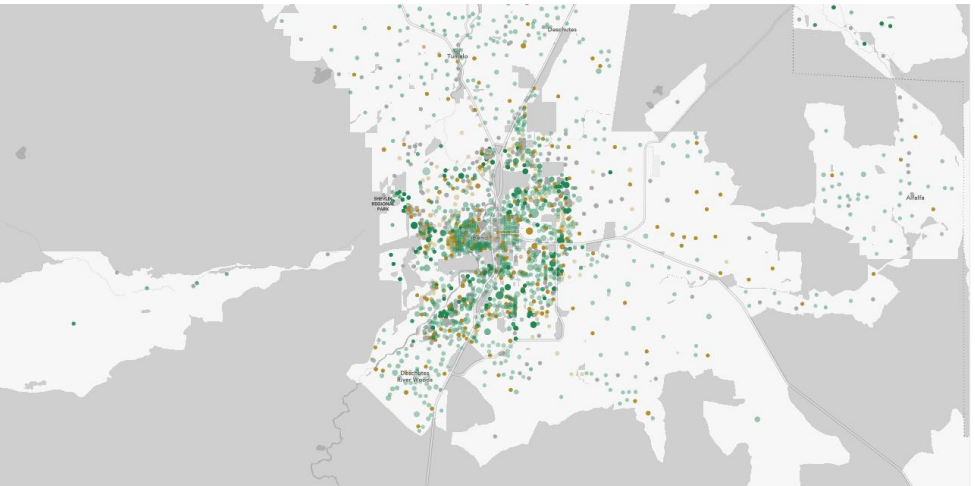


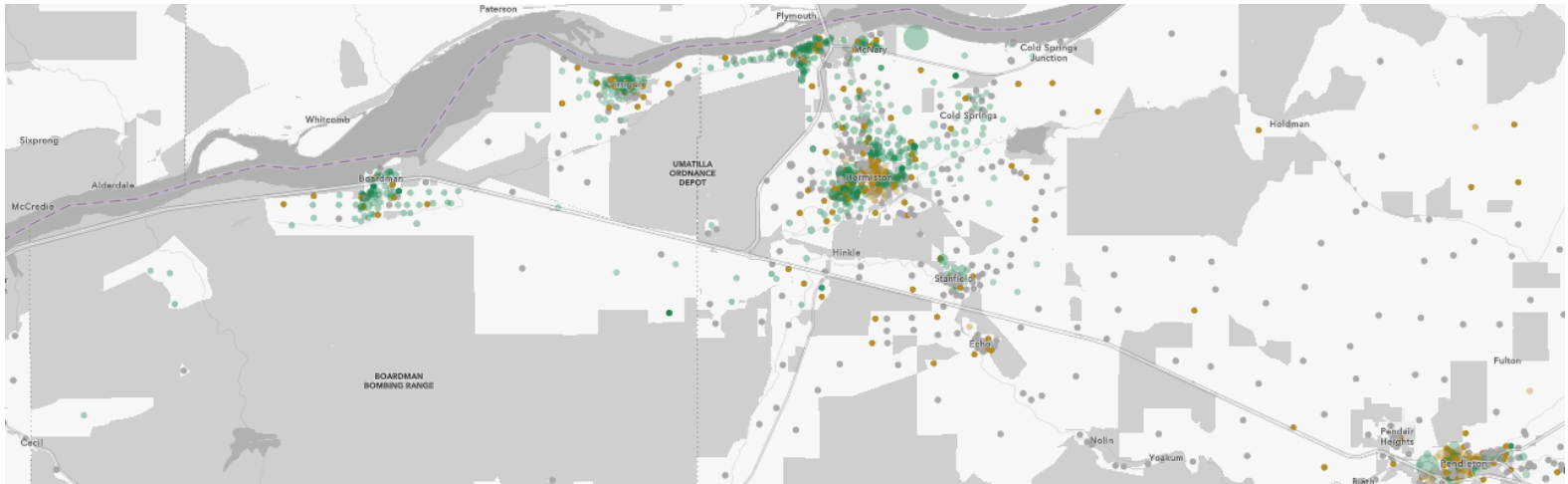
Oregon Population Change 2010-2020 (block points) (arcgis.com)


Oregon Population Change 2010-2020 (block points)
Sign In
Legend
2010 Congress Districts
Population Change 2010-2020
Predominant category
Growing
Declining
Other
Sum of categories
> 5,000
4,000
2,500
1,000
< 1
Strength of predominance
> 71
< 50
District 1
District 2
District 3
District 4
District 5
OREGON
Kennewick
Walla Walla
Baker City
Caldwell
Hines
Coos Bay
Roseburg
Grants Pass
Klamath Falls
Powered by Esri

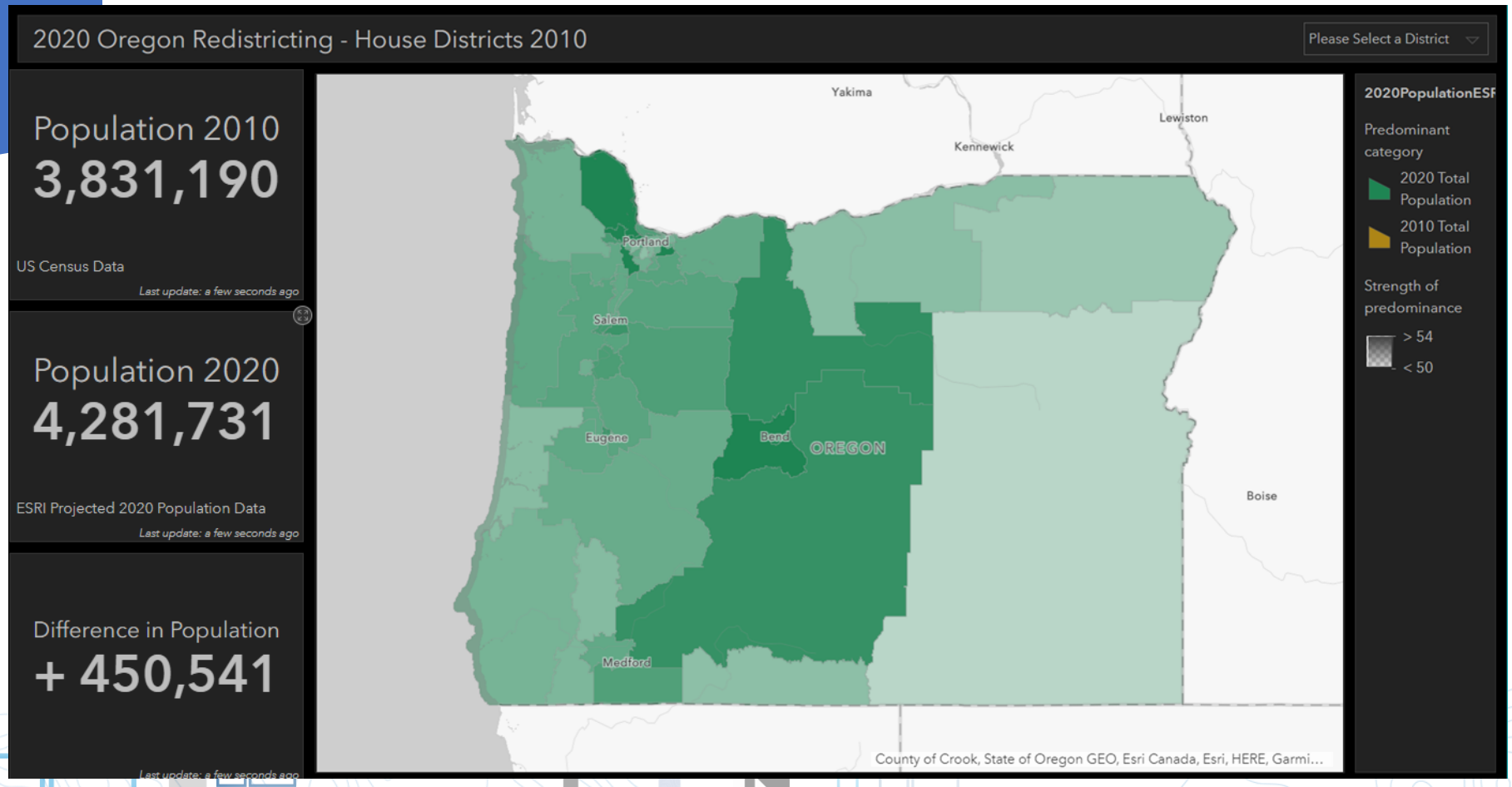

Salem
Four Corners


Portland

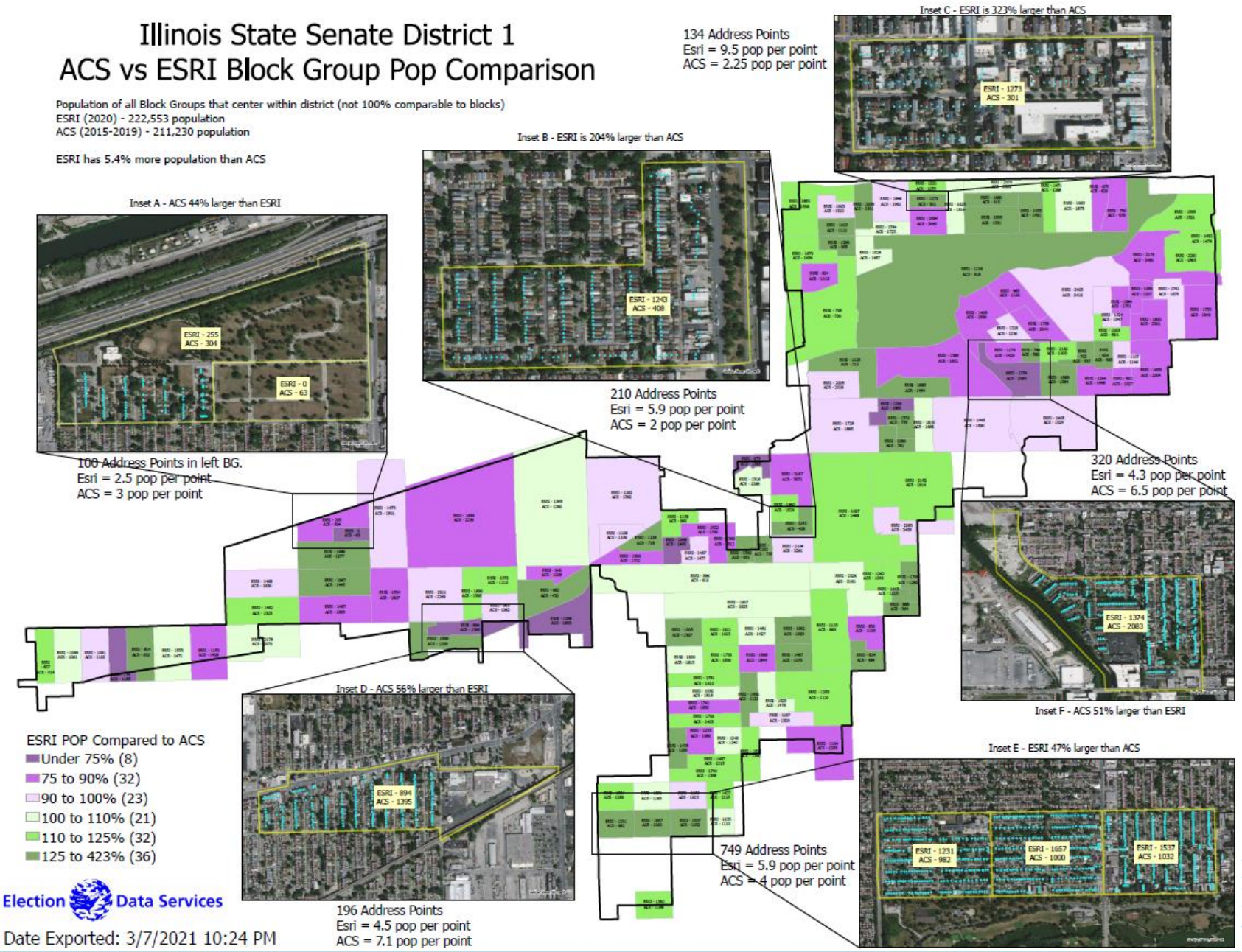



Paterson
Plymouth
McNary
Cold Springs Junction
Cold Springs
Whitcomb
Sixprong
Alderdale
McCredie
Boardman
UMATILLA ORDNANCE DEPOT
Hermiston
Holdman
Hinkle
Stanfield
Echo
BOARDMAN BOMBING RANGE
Cecil
Nolin
Yoakum
Fulton
Pendleton

Oregon House Districts



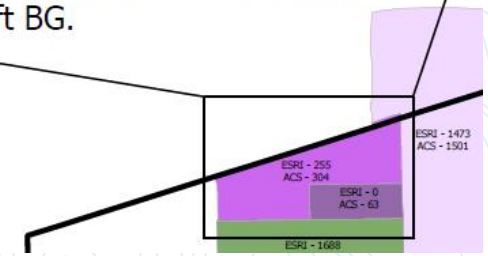
Esri 2020 Demographics vs Census ACS



Esri 2020 Demographics vs Census ACS

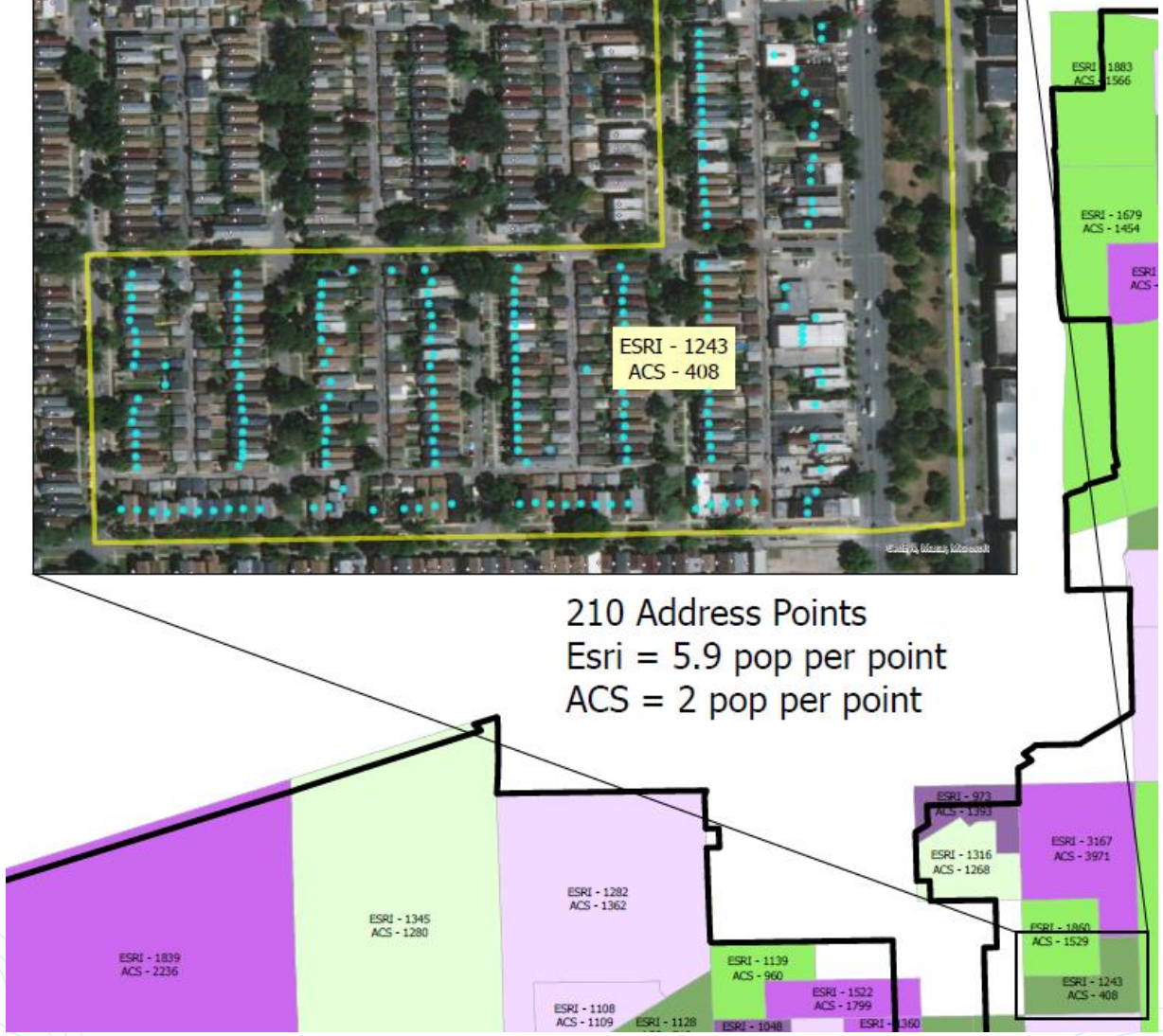
Inset A - ACS 44% larger than ESRI

100 Address Points in left BG.
Esri = 2.5 pop per point
ACS = 3 pop per point

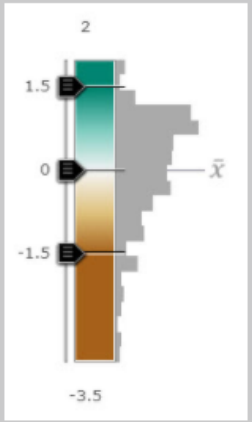


Inset B - ESRI is 204% larger than ACS

210 Address Points
Esri = 5.9 pop per point
ACS = 2 pop per point



Natural Communities Score



Click on a district in the map to see the "Natural Communities" score along with all the components that went into it.

Observation: urban areas tend to be brown (indicating a low natural communities score) - perhaps urban areas are more divided by infrastructure than the non-urban areas. Infrastructure as a boundary works against a district in this index since both infrastructure variables had negative loadings.

Astoria
Longview
Kennewick
Walla Walla
The Dalles
Hillsboro
Portland
Newberg
Salem
Albany
Corvallis
Eugene
Bend
OREGON
Baker City
McCall
Ontario
Caldwell
Boise
Burns
Coos Bay
Roseburg
Grants Pass
Medford
Altamont

How Well Do District Boundaries Reflect Natural Communities? (arcgis.com)

State of Oregon GEO, Esri Canada, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS | State of Oregon GEO, Esri Ca...
esri

Introductions

Richard Leadbeater, Global Manager
State Government Industry Solutions

Email: rleadbeater@esri.com
Office: 909-369-4448
Twitter: @PolicyMapper

Joined Esri in 1997. Mr. Leadbeater's focus is on developing tools and solutions addressing government administrative functions with attention towards the use of GIS in support of policy development, elections, redistricting, and government administrative processes.

Before Esri, Mr. Leadbeater worked as the Geographic Information Project Manager developing and implementing GIS, CADD, and Document Imaging technologies at the Washington Suburban Sanitary Commission. The WSSC is one of the largest public Water and Wastewater Utilities in the United States.

Mr. Leadbeater received a BS in Social Science and Geographic Arts from the University of Maryland in 1983.

"My goal is to move the application of GIS and geographic analysis further, from its present use by technology professionals, into the conversations that define government policy and its operations. The data governments generate must be thought of as a resource, a valued resource, that wants exploitation. I believe that data in the 21st century is what timber, iron, and coal were to the 19th century. More importantly, this resource needs proper crafting. Today, we talk about producing and mining data, but the real value is in the creation of finished goods."

esri | THE SCIENCE OF WHERE

Thank you