



Leaving No-Where Behind: Geospatially Enabled Data Disaggregation for Decision-Making

From national aggregates to local action through the Global Statistical Geospatial Framework (GSGF)

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Localization imperative

- Policy doesn't fail at the national level, it fails locally
- National averages mask local vulnerability
- Decisions happen at regional and municipal scales
- Localization is operationally necessary
- Enables integration with operationally important datasets (for disaster response, etc.)





Disaggregation Is Hard

- Incomplete or inconsistent geocoding
- Privacy and confidentiality risks
- Misalignment between administrative units and real-world processes

Disaggregation is a systems problem



The Core Problem

Statistical systems

- strong methods, weak spatial integration

Geospatial systems

- strong coverage, weak statistical linkage

Fragmented national data ecosystems

- Poor integration of social, demographic, economic, environmental data





Enter the Global Statistical Geospatial Framework (GSGF)

- Global principles for statistical geospatial integration
- Standardized common geographies and geocoding
- Interoperability and privacy protection
- Location key for linkages

The Five GSGF Principles



Source: UNGGIM, UNSD (2025)

[GSGF v2 GGIM](#)

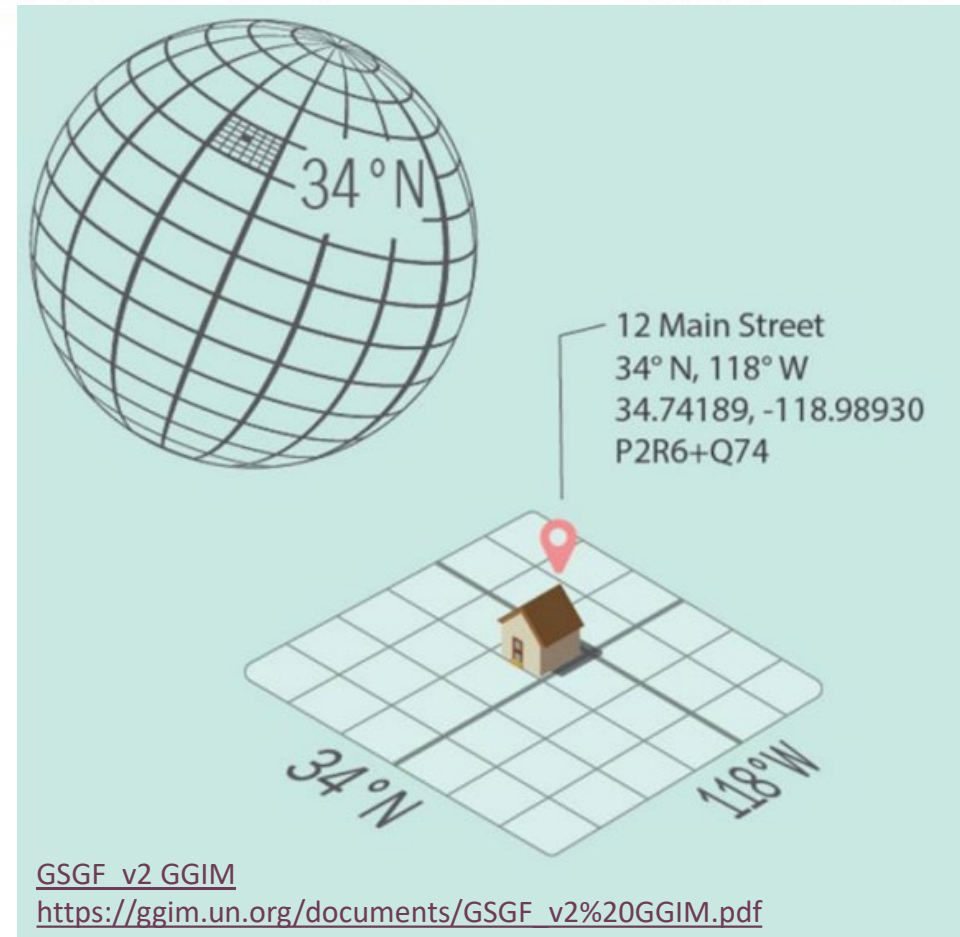
https://ggim.un.org/documents/GSGF_v2%20GGIM.pdf





GSGF as an Enabler of Integration

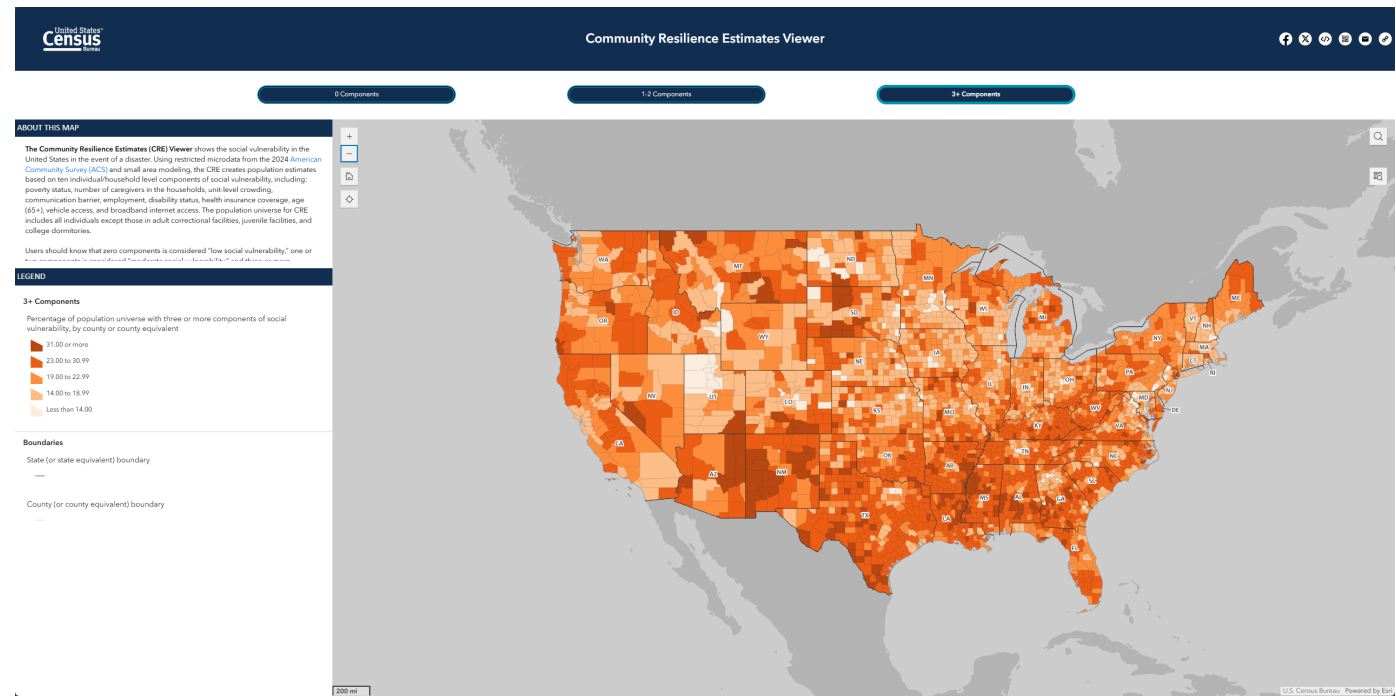
- Conceptual framework
- Assign geocodes to statistical and administrative data
- Link datasets across sectors
- Enable consistent, location-based statistics





Downscaling & Small Area Estimation

- Data gaps at local levels
- SAE + geospatial data → local estimates
- Required SDG disaggregation dimensions



Community Resilience Estimates Viewer
<https://arcg.is/yD5Pr1>



From Administrative Units to Grids

- Uniform spatial units
- Avoid MAUP issues
- Align with EO and environmental data
- Enable cross-domain integration

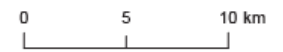
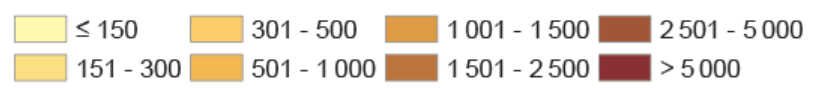
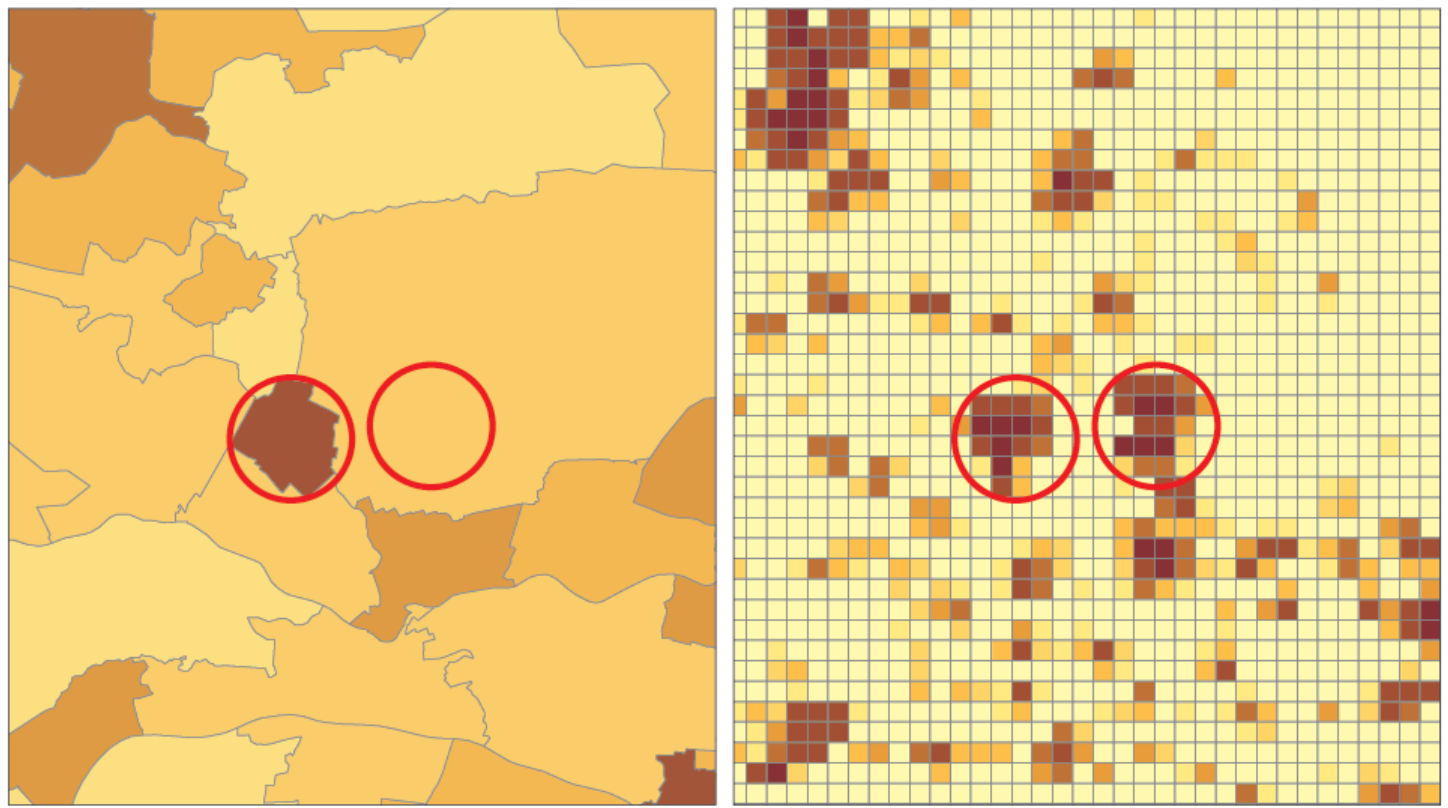
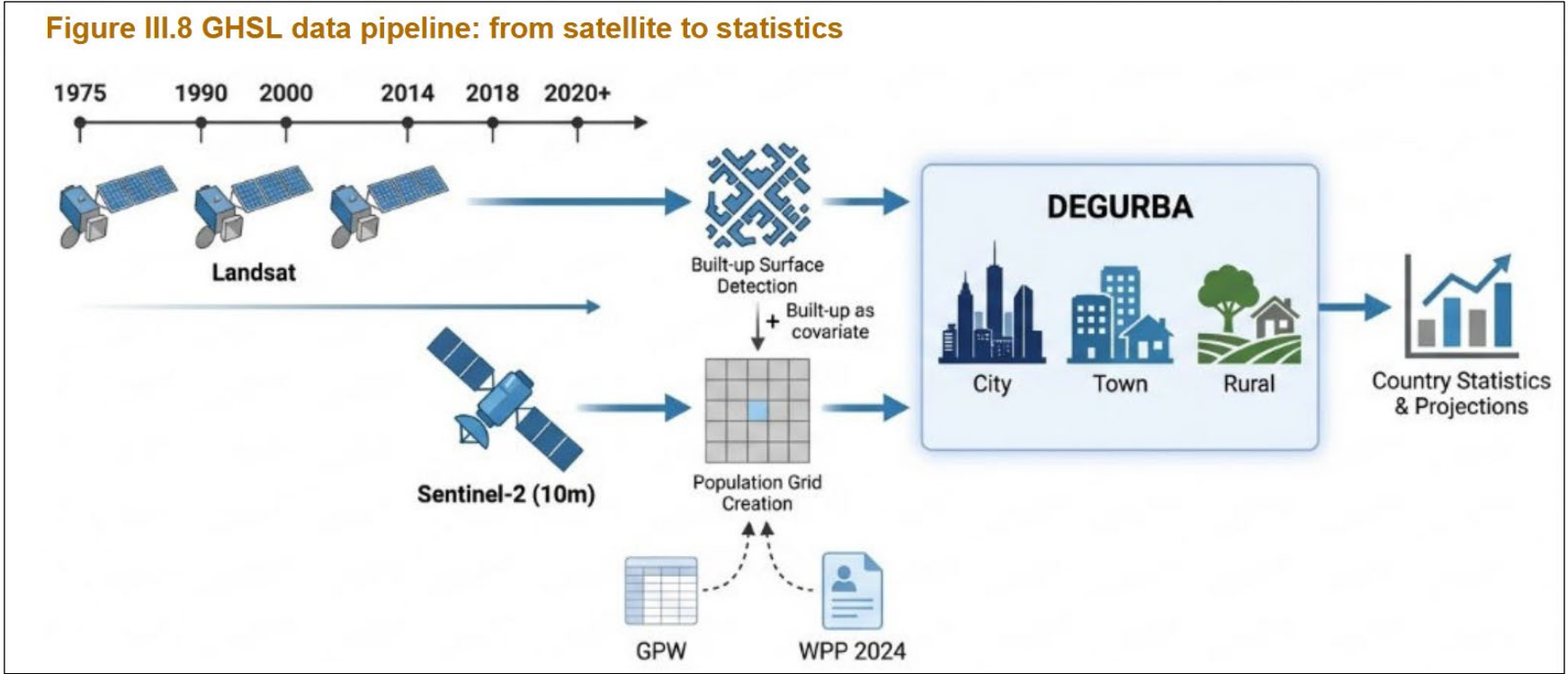


Figure 3.3: Population density of administrative units and grid cells in Veenendaal, the Netherlands, 2011, (inhabitants per km²), Source: Eurostat (GEOSTAT 2011)



Earth Observation (EO) as critical input



- EO provides complete, consistent coverage
- Supports environmental and spatial indicators
- Complementing (not replacing) official statistics

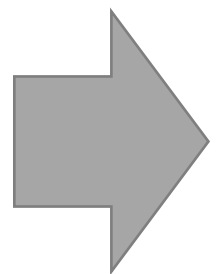


Address Canvassing Evolution

2000

100 PERCENT
In-Field Address
Canvassing through
Address Listing and
Block Canvassing
operations

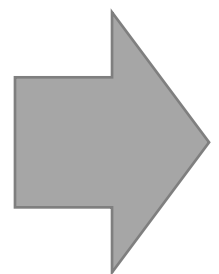
Paper based
operation



2010

100 PERCENT In-
Field Address
Canvassing

Digital data
collection including
GPS



2020

35 PERCENT In-Field
Address Canvassing

100 PERCENT In-
Office Address
Canvassing

Digital data
collection including
GPS





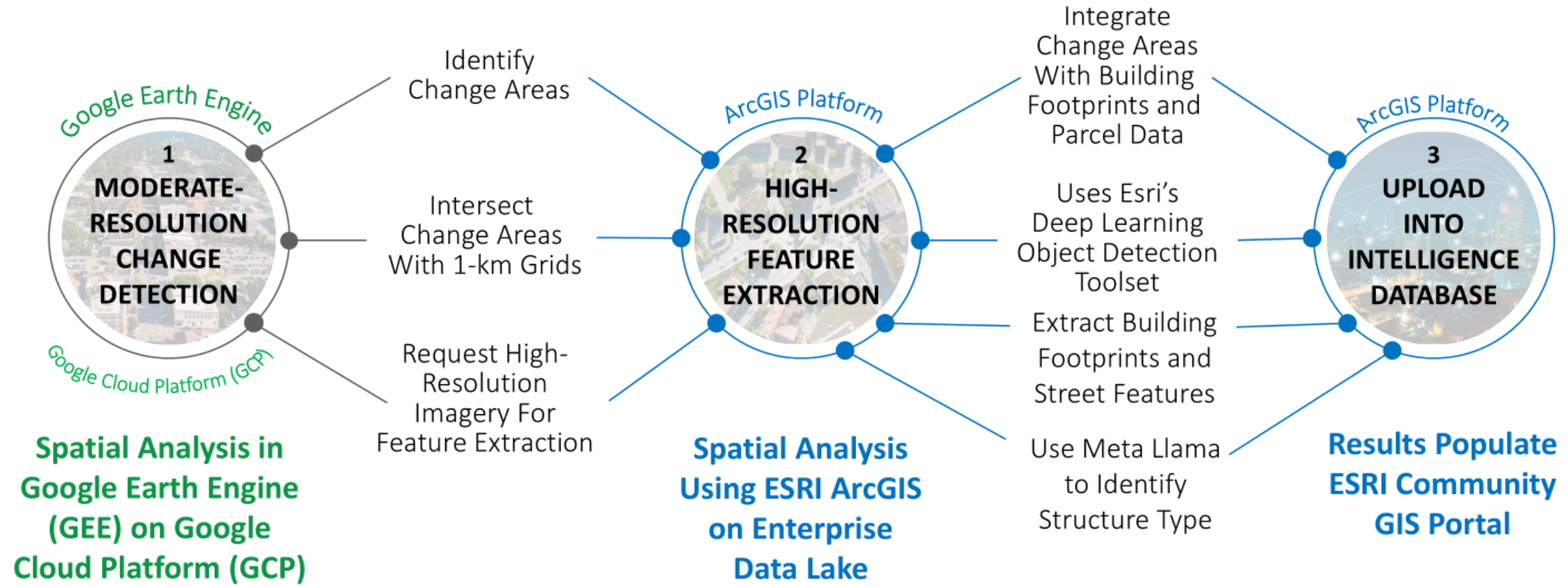
Parcel Data Use

- National Parcel Dataset
 - For our process, we currently use two different types of nationwide Parcel Datasets
 - Process Parcel Datasets and run address matching twice a year
 - 1-1.5 Terabyte each
 - Spring and Fall vintages
- Content
 - Parcel Polygons
 - Assessor Points (parcel centroids)
 - Address Points
 - Building Footprint Polygons
 - Relational Tables





Analytics and Change Detection Team



ACD Process



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Building Footprint Extraction



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External Sources of Building Footprints Combined
 (Green Buildings)
 ©2023, Maxar, USG Plus



Esri Base Pretrained Model (Blue Buildings)
 ©2025, Maxar, USG Plus



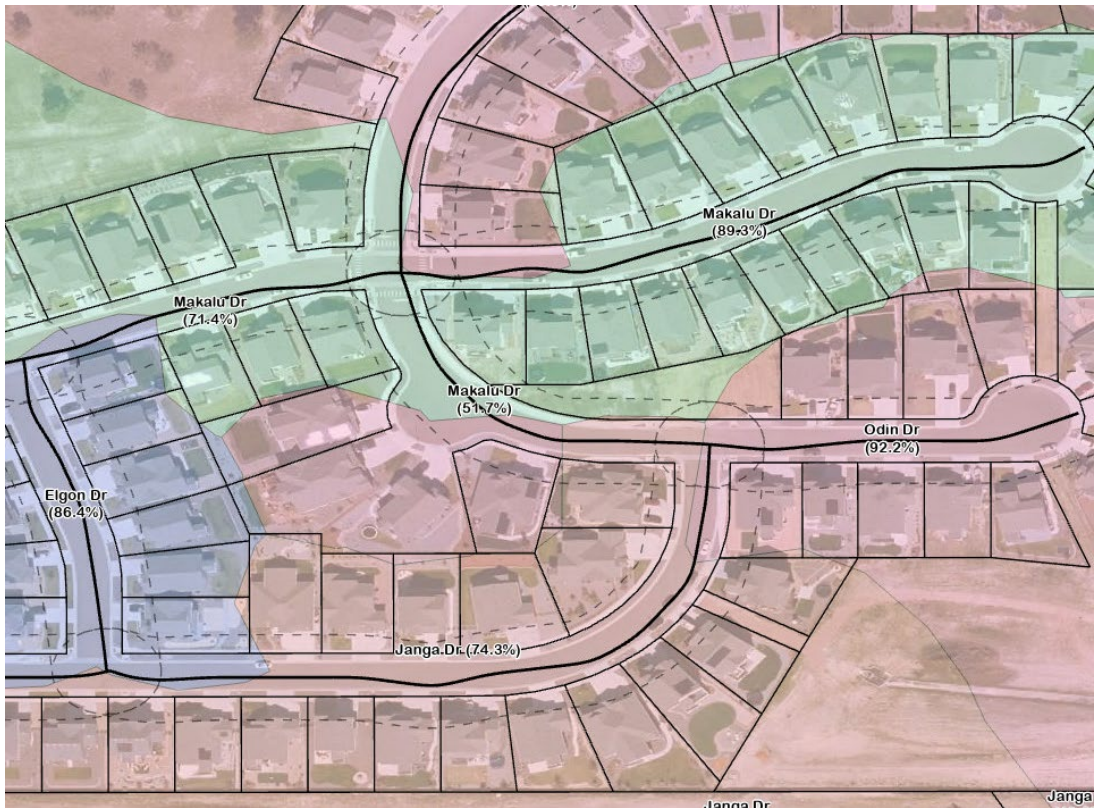
ACDC Best Model – Supplemental Training on Esri Model
 (Magenta Buildings)
 ©2025, Maxar, USG Plus

Building Source	Most Recent Image	Footprints Generated	F1 Score
Ground Truth	2/6/2025	695	-
Esri Base Pretrained Model	2/6/2025	495	0.81
ACDC Intermediate Model	2/6/2025	730	0.86
ACDC Best Model	2/6/2025	725	0.96
External Sources Combined	10/7/2023	582	0.48





Automated Road Feature Extraction (ARFE)



Background

- EDL Esri environment upgraded in Spring 2025
- Deep learning package based off Segment Anything Model (SAM)

Stages

- Initial Extraction
- Post Processing
 - Topological Cleanup
 - Parcel Matching
- Conflation/Update

Proof of Concept

- Clark County, NV
 - Over 3,000 roads added totaling just under 400 miles



Search:

Filter ▾

Update (March 4, 2026): ACS and LODES data updated

Events as of 05/02/2026

Wildfires

Hwy 82 Fire
Zip 31543, 31566
Affected 2020 Population: 928

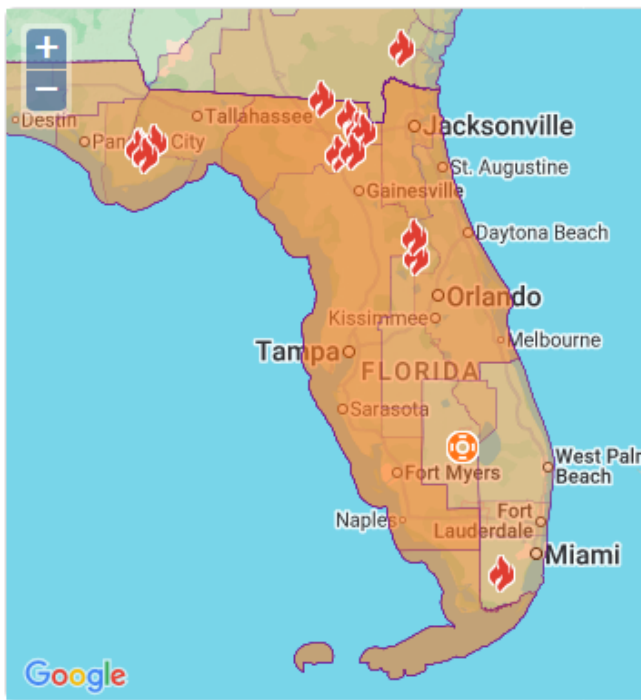
Qury Fire
Zip 57730
Affected 2020 Population: 80

Pineland Road Fire
Clinch County, GA, Echols County, GA
Affected 2020 Population: 67

Skyline Fire
Zip 92284
Affected 2020 Population: 24

Lemon 2 Fire
Zip 58335
Affected 2020 Population: 16

Hwy Ss Fire
Zip 54757
Affected 2020 Population: 6



Legend & Map Controls

Event Types

- Tropical Storms
 - Current Wind Radii
 - Wind History (Cumulative Swath)
 - Forecast Area (Cone of Uncertainty)
- Wildfires
 - Perimeter
- Floods
 - Likely
 - Occurring or Imminent
- Winter Weather
 - Forecasted Snowfall
 - Forecasted Freezing Rain
- Disaster Declaration Areas
 - Emergency or Disaster Declaration
- COVID-19 Pandemic



Community Resilience Estimates Viewer



0 Components

1-2 Components >

3+ Components >

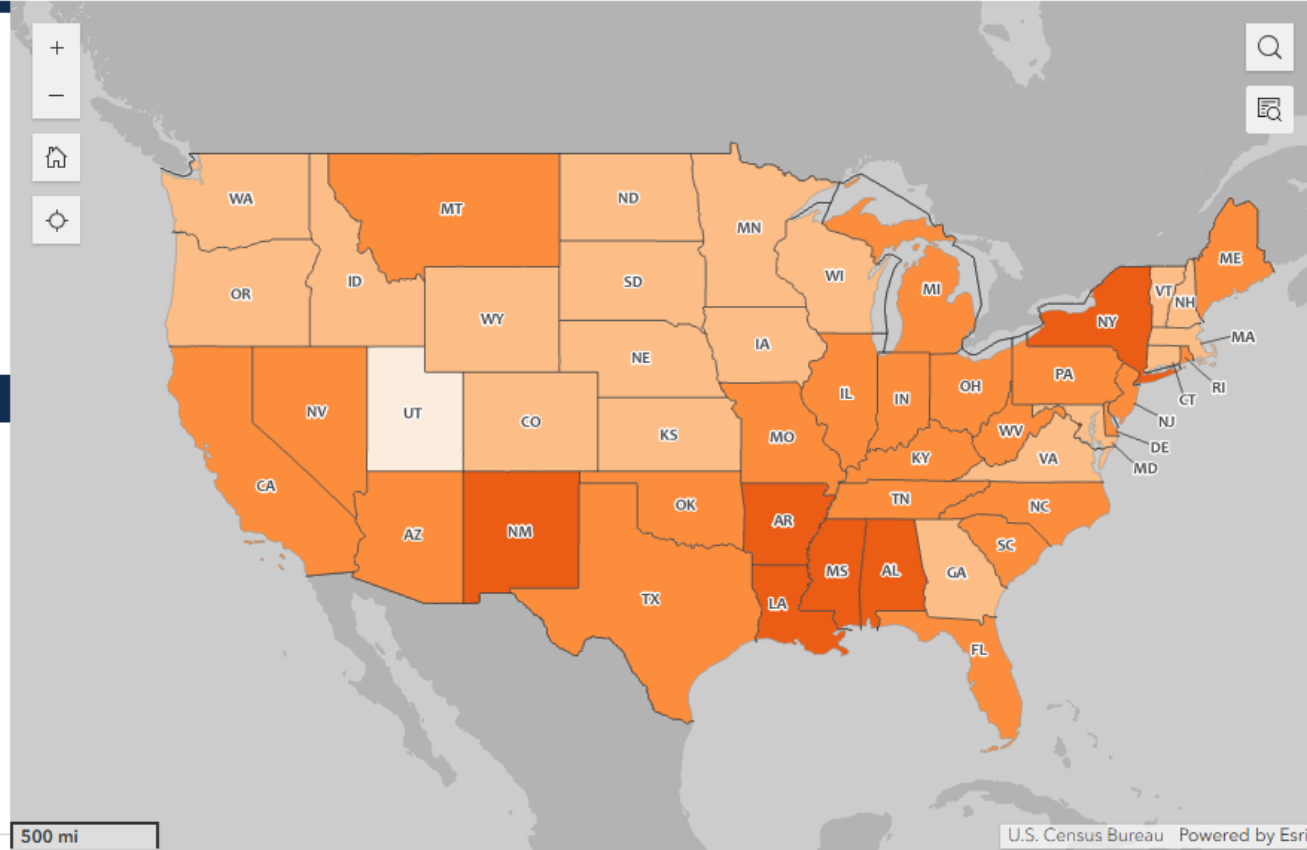
The Community Resilience Estimates (CRE) Viewer shows the social vulnerability in the United States in the event of a disaster. Using restricted microdata from the 2024 [American Community Survey \(ACS\)](#) and small area modeling, the CRE creates population estimates based on ten individual/household level components of social vulnerability, including: poverty status, number of ...

LEGEND

3+ Components

Percentage of population universe with three or more components of social vulnerability, by state or state equivalent

- 23.00 or more
- 19.00 to 22.99
- 14.00 to 18.99
- Less than 14.00



500 mi

U.S. Census Bureau Powered by Esri





Community Resilience Estimates Viewer

0 Components

1-2 Components

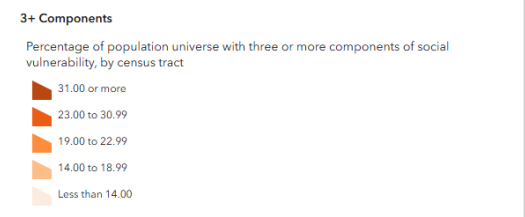
3+ Components

ABOUT THIS MAP

The **Community Resilience Estimates (CRE) Viewer** shows the social vulnerability in the United States in the event of a disaster. Using restricted microdata from the 2024 [American Community Survey \(ACS\)](#) and small area modeling, the CRE creates population estimates based on ten individual/household level components of social vulnerability, including: poverty status, number of caregivers in the households, unit-level crowding, communication barrier, employment, disability status, health insurance coverage, age (65+), vehicle access, and broadband internet access. The population universe for CRE includes all individuals except those in adult correctional facilities, juvenile facilities, and college dormitories.

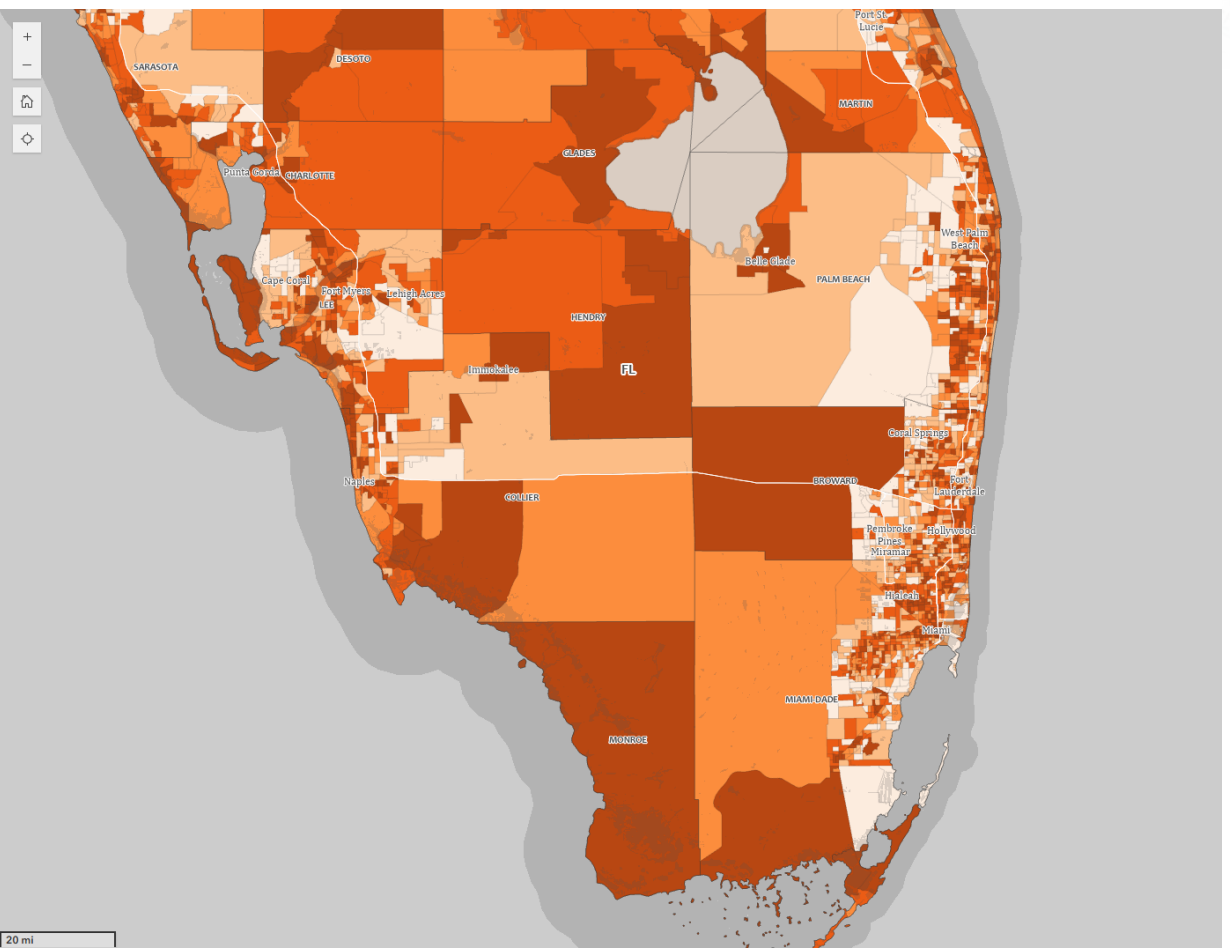
Users should know that zero components is considered "low social vulnerability," one or two components is considered "moderate social vulnerability," and three or more components is considered "high social vulnerability."

LEGEND



Boundaries

- State (or state equivalent) boundary
—
- County (or county equivalent) boundary
—
- Census tract boundary
—





What's Changing in Practice

- Hybrid data ecosystems
- Grid-based dissemination
- Stronger NSO–NGIA collaboration
- Integration becoming an institutional necessity



Standards



Integration



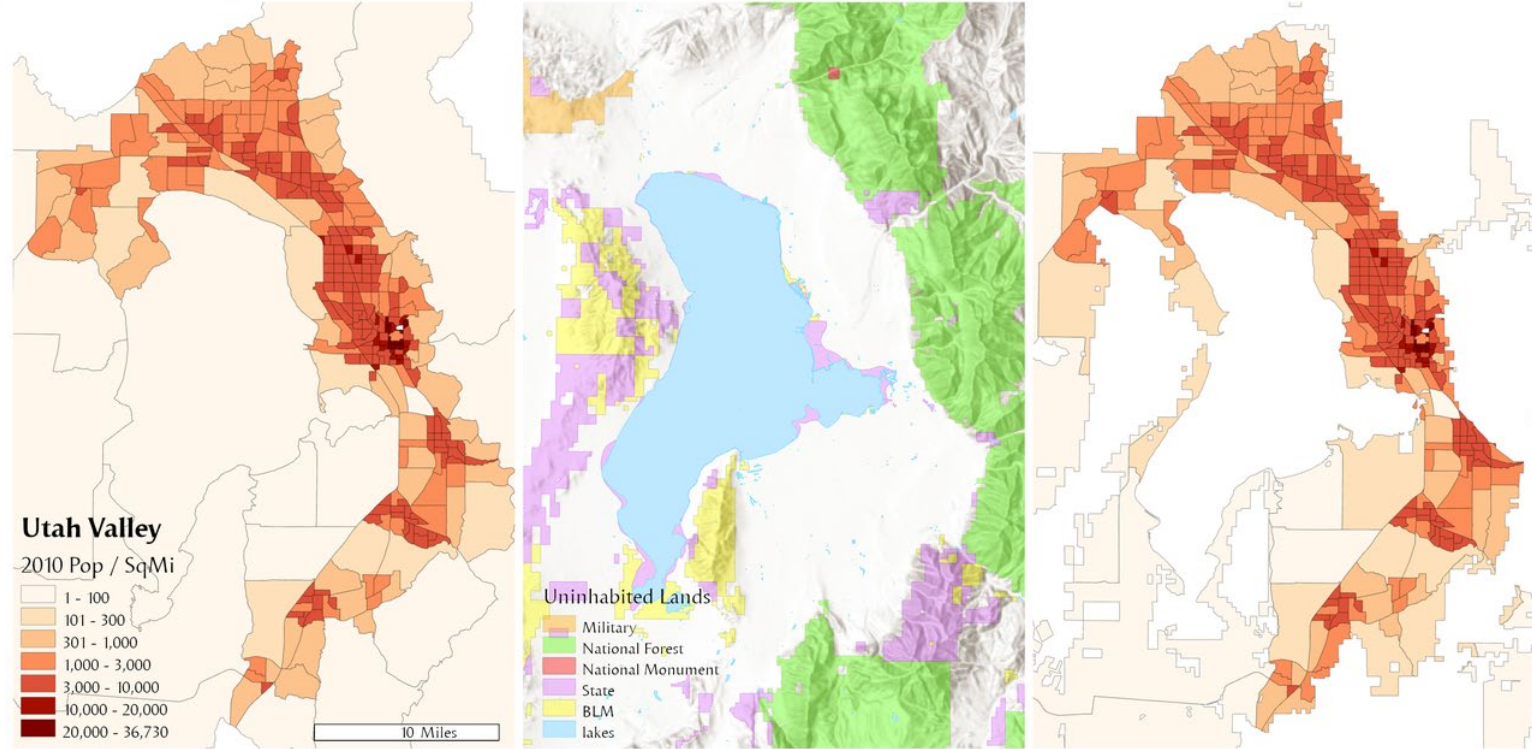
Frameworks





Key Takeaways

- Disaggregation = systems challenge
- GSGF = integration backbone
- EO + grids + SAE = scalable solutions
- Integration → decision-ready evidence



Thank you!

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AND GEOSPATIAL INFORMATION