



NATIONAL WEATHER SERVICE
Building a Weather-Ready Nation

Geospatial Technology's Role In Focused Service Equity Success

May 30, 2024 - VLab Forum

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What is “service equity?”

...and how does it apply to the NWS mission?



Equality vs Equity

- Not everyone can access services with equal ease.
 - Language barriers, physical limitations, systemic issues
- Equity provides a balance by being as inclusive as possible in providing those services.



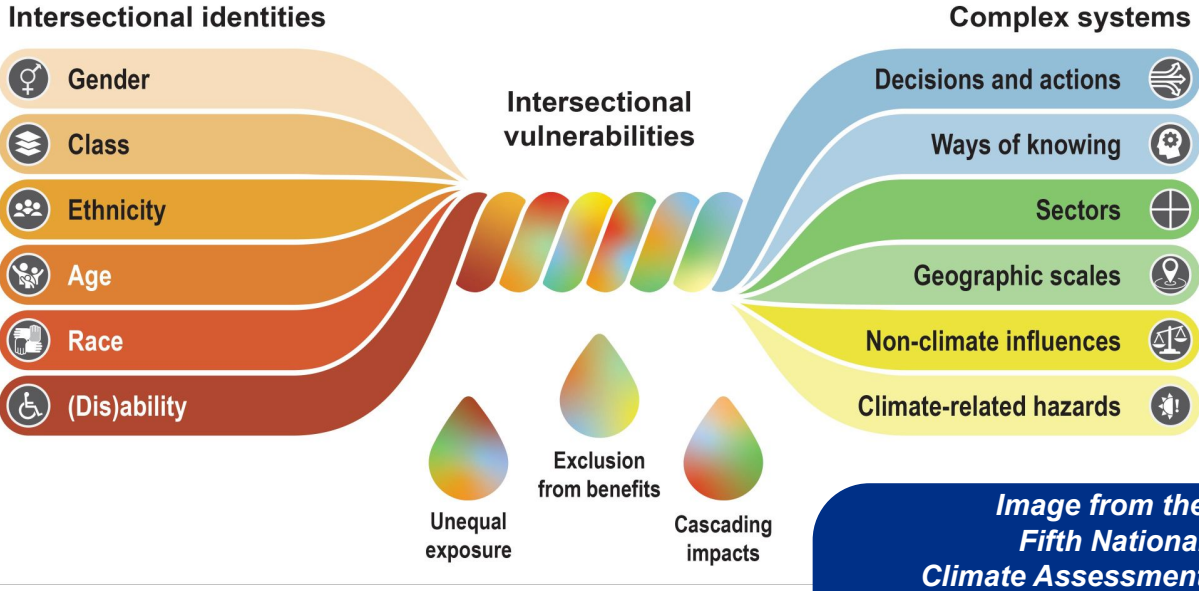
NWS Service Equity

- Our mission doesn't delineate who we serve - we serve everyone.
- We must meet communities where they are, and we aren't doing that now.
- Wholesale change in our operations and interactions is needed.

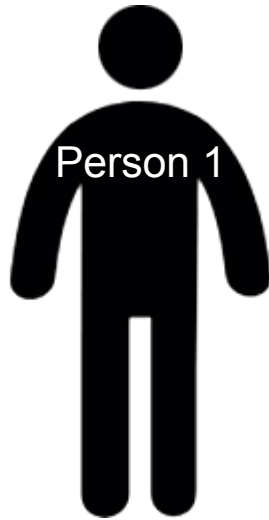


Add complex systems and unique vulnerabilities emerge

Intersectional Vulnerabilities



Take two people in the same general area...



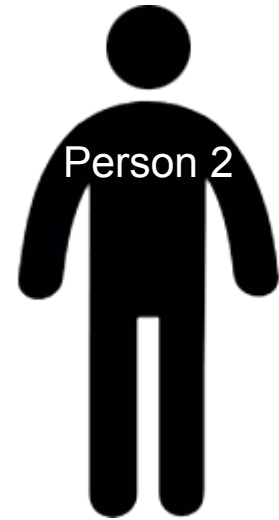
Person 1

Black male
Late 40s
Hard of hearing
English-speaking
Raised in Collinsville, IL

Do these two people...

- take information in the same way?
- interpret information in the same way?
- act on information in the same way?
- practically receive the same level of support from their government?

Likely not.



Person 2

Asian female
Early 20s
Blind
Not proficient in English
Raised in New York, NY



What are your biggest barriers to more equitable service?

Service equity requires listening, learning, and adjusting

This isn't a finish line to reach, it's a mindset to adjust

NWS Service Equity Priority Actions

- Outlines steps we as an agency must take to keep service equity in mind
- Plan breaks down into several priority areas, one of which is “tools and technology actions”

Datasets, tools, and other technologies more readily available can break down barriers to build trust in communities and move us toward this paradigm shift.

Equitable Services for a Weather-Ready Nation

NWS Service Equity Priority Actions
2023-2026

Last Update: 17-Mar-2023



PRIORITY AREA 4: TOOLS & TECHNOLOGY ACTIONS

26. Develop a comprehensive plan to implement multilingual translation for NWS services (for operational activities and for education and outreach).
27. Prototype automated enterprise multilingual translation capability for NWS products and services.
28. Implement the IDSS Management System.
29. Implement NOAA Social Behavioral and Economic Science (SBES) Observation Database.
30. Update and expand the Cooperative Observer Program (COOP) in order to improve its viability and presence in HUSVCs.
31. Implement Social Media Demographics Tool.
32. Implement GIS-based Social Vulnerability Impact Assessment Tool.
33. Implement high-precision polygon-based approach for all NWS products and services.
34. Implement comprehensive probabilistic forecasting and hazard services.



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GIS is the intersection of “where” and “what,” and vulnerability is tied to where people live

Knowing more about vulnerabilities teaches us the “why” and “how”

- 1 It gives us insight into where we need to focus resources.
- 2 It informs what we say to them and how we say it.
- 3 It highlights the unique challenges they may face.
- 4 It leads us to ask questions and learn more about their challenges.

Plan → Listen → Learn → Act



NWS Field Offices are GIS proving grounds

Storm-SAFER: Situational Awareness For Emergency Response

NOAA/NWS Cheyenne Link

Watches & Warnings | Looping Radar + River Status | NWS Chatroom | Latest Weather Stories

Tornado Warnings: (In Map Window)

Tornado Warning Count: 0

TOR Warning Population: 0

Severe Thunderstorm Warnings: (In Map Window)

Issued by (NWS Office): KLCH
Hazard Type: Severe Thunderstorm Warning
Valid from: 2024-05-12T16:13:00-05:00
Expires: 2024-05-12T16:45:00-05:00

Severe Thunderstorm Warning Count: 1

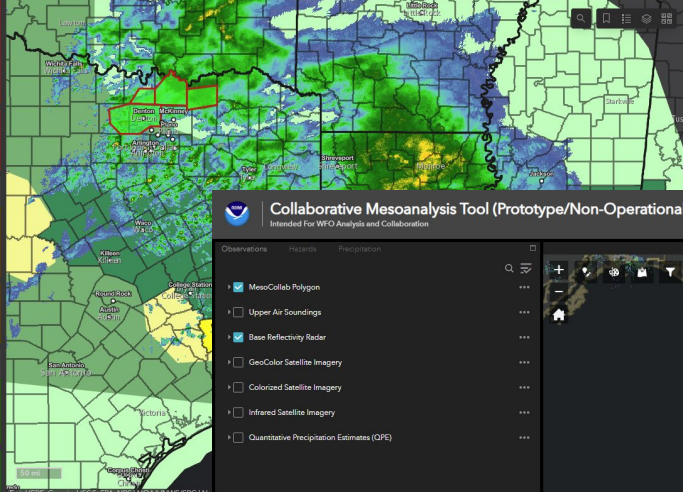
SVR Warning Population: 99.13k

Flash Flood Warnings: (In Map Window)

Issued by (NWS Office): KFWD
Hazard Type: Flash Flood Warning
Valid from: 2024-05-12T16:29:00-05:00
Expires: 2024-05-12T18:00:00-05:00

Flash Flood Warning Count: 4

FFW Warning Population: 736.29k



Storm Map | SPC Day 1 Hazards | SPC Day 1 Outlook

NWS SAFER, built in AGOL Dashboards

Collaborative Mesoanalysis Tool (Prototype/Non-Operational)

Intended For WFO Analysis and Collaboration

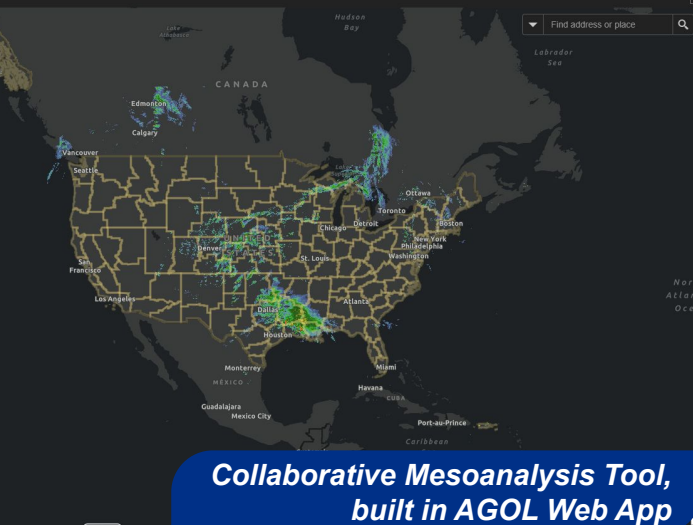
Test Version | VLab Page | Analysis Dashboard | Feedback

Observations | Hazards | Precipitation

- MesoCollab Polygon
- Upper Air Soundings
- Base Reflectivity Radar
- GeoColor Satellite Imagery
- Colorized Satellite Imagery
- Infrared Satellite Imagery
- Quantitative Precipitation Estimates (QPE)

Forecasts | Map Info | Basemap

- MesoCollab Polygon
- SPC Day 1 Outlook
- SPC Day 2 Outlook
- SPC Day 3 Outlook
- SPC Day 1 Fire Outlook
- SPC Day 2 Fire Outlook
- WPC ERO Day 1
- WPC ERO Day 2
- WPC ERO Day 3



Find address or place

Collaborative Mesoanalysis Tool, built in AGOL Web App



GIS has a role to play in getting us on the road to service equity!

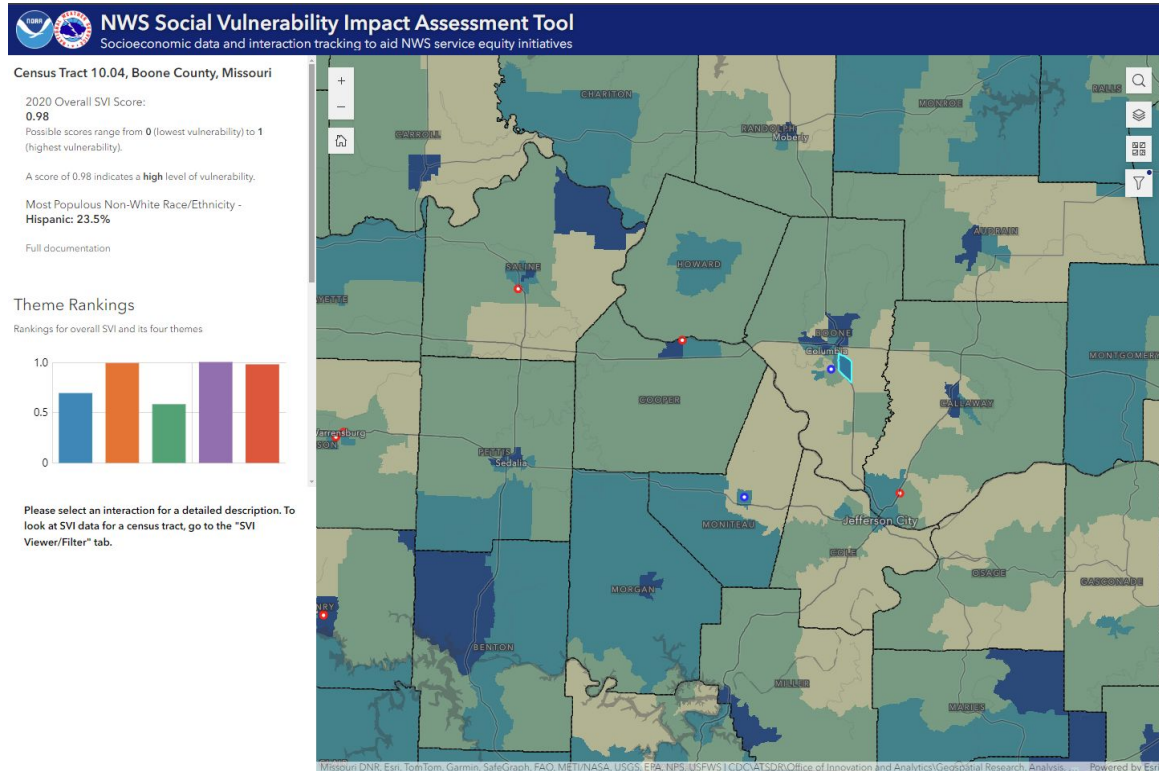


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Tools are being developed to aid the field

Welcome to the NWS Social Vulnerability Impact Assessment Tool (SVIAT)

- Track interactions
- Explore socioeconomic data relevant to NWS service and outreach initiatives
- Filter past data to identify service trends
- Temporarily add local data sources to augment tool



The path to greater service equity is daunting. This data can help kickstart that journey.

How can GIS aid our service equity initiatives?

Census Tract 8101, Lincoln County, Missouri

2020 Overall SVI Score:

0.78

Possible scores range from **0** (lowest vulnerability) to **1** (highest vulnerability).

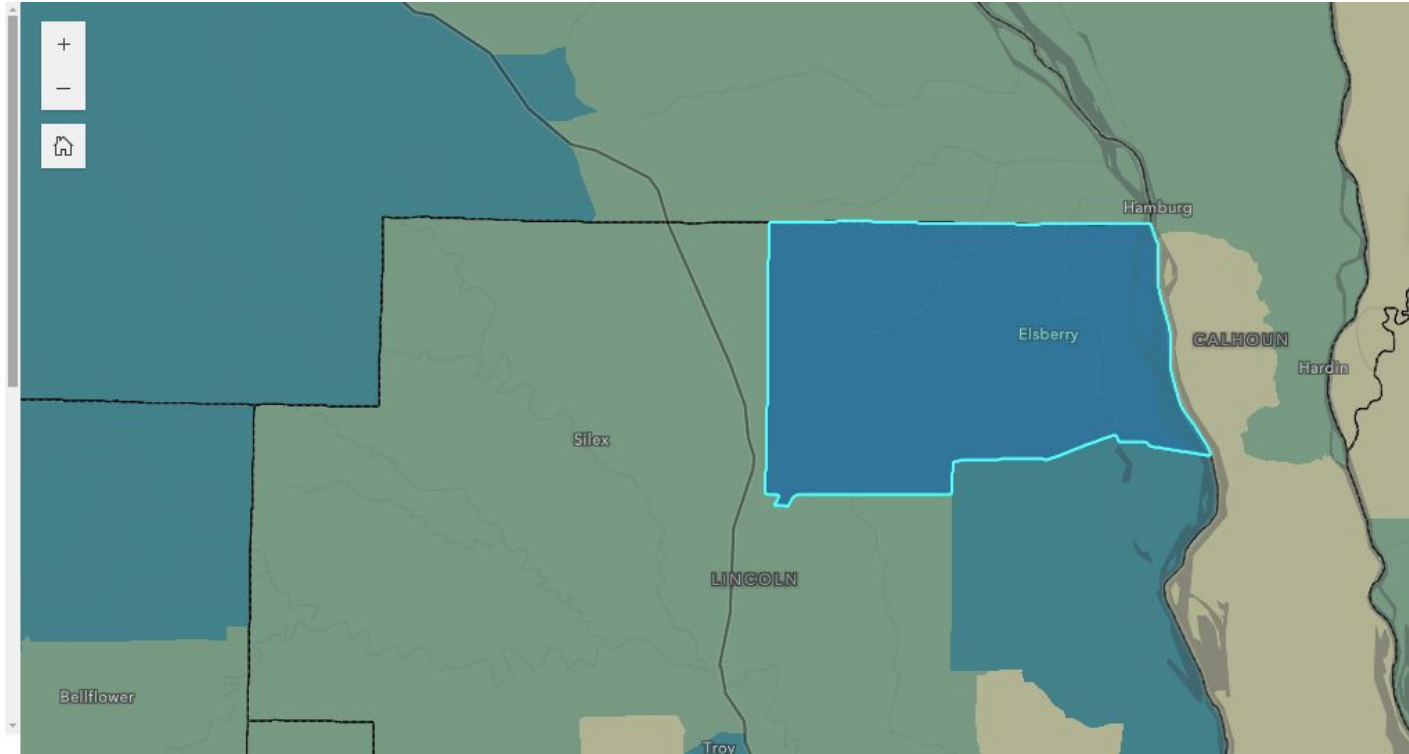
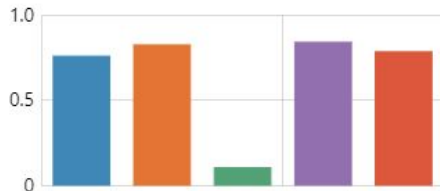
A score of 0.78 indicates a **high** level of vulnerability.

Most Populous Non-White Race/Ethnicity - **African American/Black: 2.3%**

[Full documentation](#)

Theme Rankings

Rankings for overall SVI and its four themes



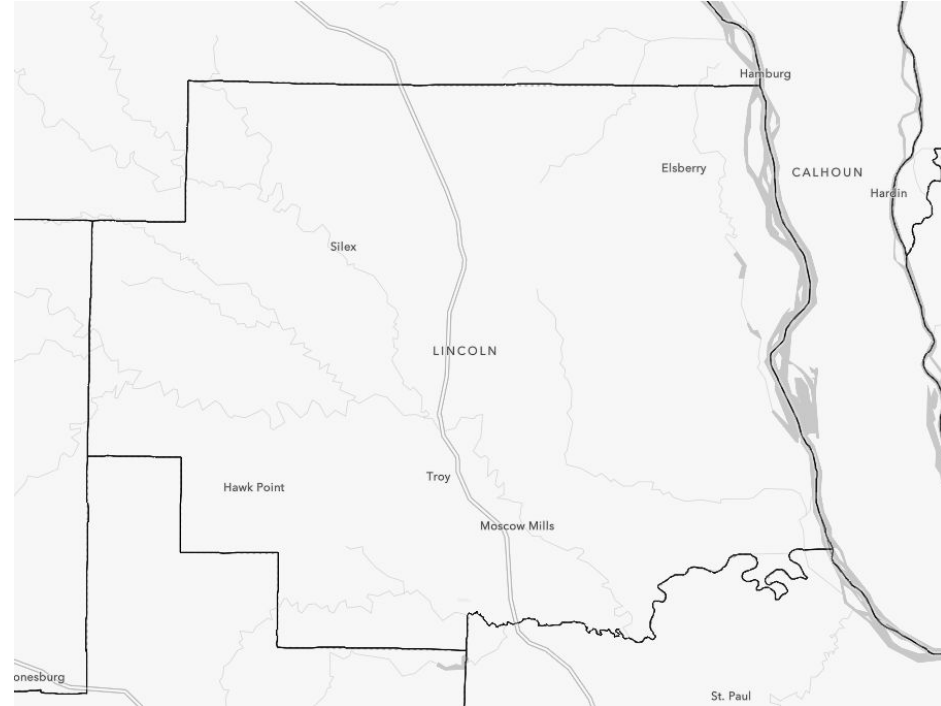
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How can GIS aid our service equity initiatives?

Let's take Lincoln County, Missouri for example

- Rural county on the northwest fringes of the St. Louis, MO metropolitan area.
- Has one major highway, US-67, nearly bisecting it.
- Several small tributaries of the Mississippi River run through it.

What kind of vulnerabilities does this county face?



How can GIS aid our service equity initiatives?

Take a look at the its Social Vulnerability Index details

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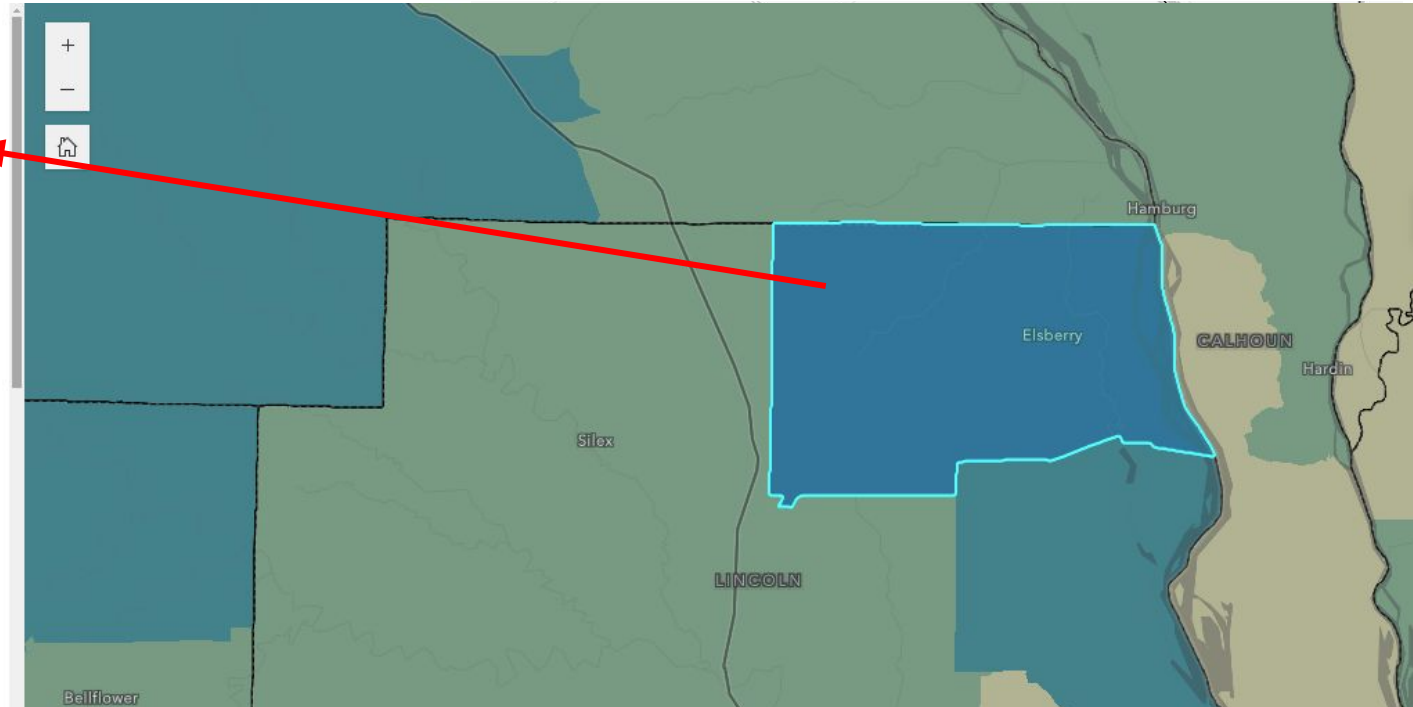
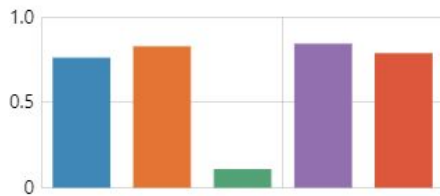
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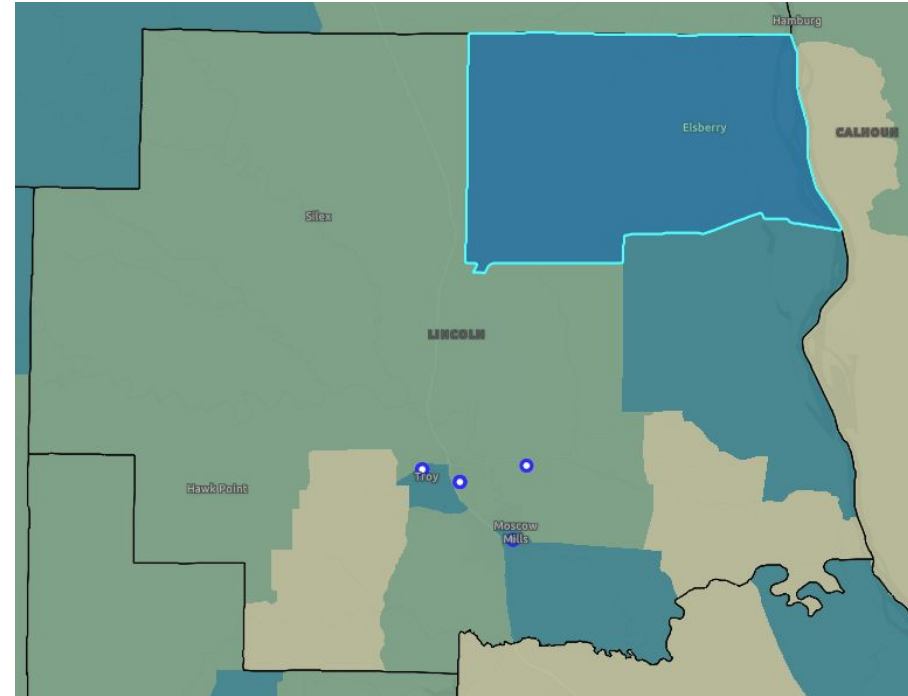


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How can GIS aid our service equity initiatives?

Have we been there in a while?

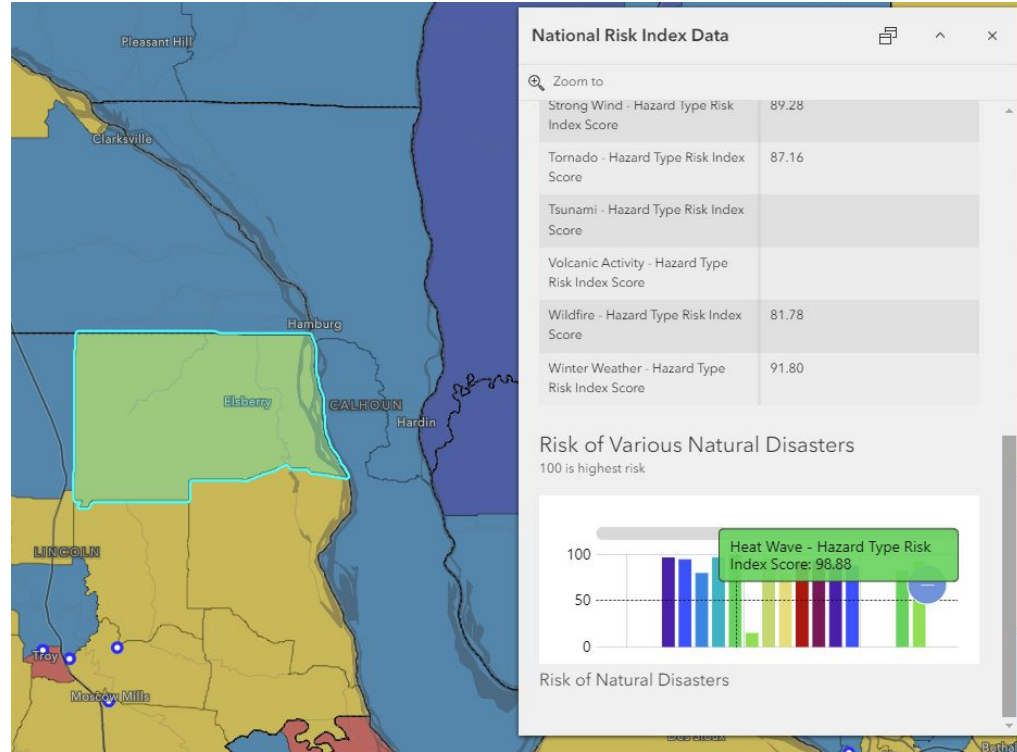
- We've been to the county a few times recently, but not up that way where they're most vulnerable (in theory).
- If we were to visit, what would we talk about? What weather hazards do we focus on?



How can GIS aid our service equity initiatives?

What weather threatens them the most?

- Another dataset can clue us into what types of weather impact this area.
 - In this case, they're susceptible to heat waves and severe weather.
- Is this the only hazardous weather that threatens them?
 - No, but that's where the data ends and local knowledge begins!



Isn't this just another NOEES?

Yes and no.

NOEES

- Users must request access
- No social vulnerability datasets
- No geospatial component
- Only acts to record data
- Difficult to navigate at times

SVIAT

- Most NWS employees have access
- Preset datasets with the user capability to add more
- Rooted in GIS for easy analysis and identification of spatial trends
- Teaches users about their area

GIS tools like the SVIAT lead to informed interaction decisions and discourage “throwing spaghetti at the wall.”



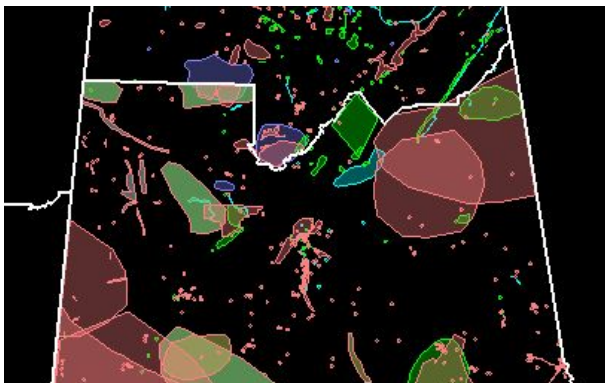
SVIAT Live Demo



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SVIAT isn't the silver-bullet vulnerability tool

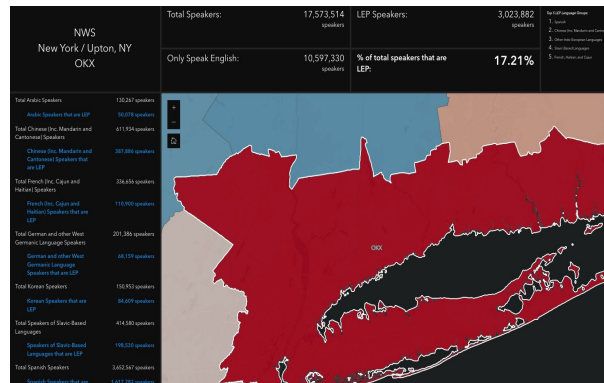
Plot twist: no such tool exists!



Brief Vulnerability Overview Tool (BVOT)

- Uses knowledge-derived approach to vulnerability data
- Locally-developed to highlight unique vulnerabilities

Learn more about BVOT [here](#)



NWS LEP Dashboard

- Highlights limited english proficiency (LEP) groups across the nation by percentage of population within a County Warning Area (CWA)

For more information, email monica.bozeman@noaa.gov



Equity is never automatic

Without purposeful focus on equitable service, our mission will falter

- Internally or externally, if we ignore the importance of equity, we will fail.
- The task is daunting, **but data and equity-informed actions based on that data can help us.**
- GIS tools and analysis in particular are powerful tools to leverage: they can unveil vulnerabilities you never knew existed.

**Nothing replaces human interaction:
the data just gets you started!**



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?

Email: matthew.beitscher@noaa.gov

Read the Service Equity Priority Actions here!

Interact with the SVIAT here!

Questions?

Thank you!

