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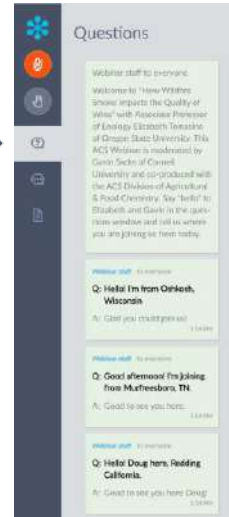


Questions or Comments?

Type them into the questions box!



"Why am I muted?" Don't worry. Everyone is muted except the Presenter and the Host. Thank you and enjoy the show.



1

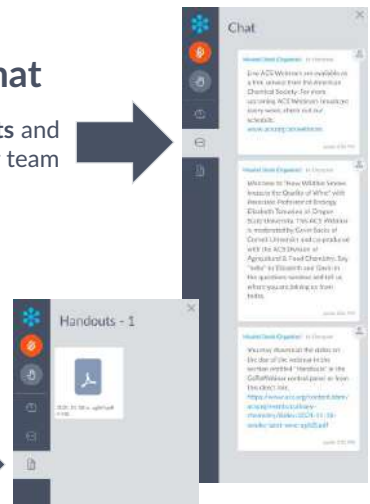


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Chat Announcements and hyperlinks from our team

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2



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Mier., 16 de Marzo, 2022 | 3pm – 4pm ET
Covidianidad: Después de la Pandemia

Coproducido con la Sociedad Química de México



Tues., March 29, 2022 | 1pm – 2pm ET
Chocolate Chemistry

Co-produced with the ACS Senior Chemists Committee and ACS Office of Philanthropy



Thurs., March 31, 2022 | 2pm – 3:15pm ET
What's All This Dry Stuff Doing in My Wet Beer?

Co-produced with ACS Division of Agricultural & Food Chemistry

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A science podcast by the American Chemical Society about things small in size but BIG in impact.



Sam Jones, PhD
Science Writer & Exec Producer



Deboki Chakravarti, PhD
Science Writer & Co-Host

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Career Consultant Directory



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The Office of Diversity, Equity, Inclusion & Respect (DEIR) is the central hub at the American Chemical Society that coordinates, supports, and guides all efforts by staff, members, and governance toward Strategic Goal 5, "Embrace and Advance Inclusion in Chemistry." The Office of DEIR at ACS is committed to empowering everyone, irrespective of lived experience and intersectionality of identities, to fully participate in the chemistry enterprise. The Office of DEIR welcomes comments, suggestions, and questions around issues of diversity, equity, inclusion, and respect from members at any time. Please do not hesitate to reach out to the Office through this form.



Please do not hesitate to reach out to the Office of DEIR at diversity@acs.org

<https://fs7.formsite.com/acsdiversity/ACSMemberFeedback/index.html>

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WILL BEGIN SHORTLY...**

👋 Say hello in the
questions window!

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Chemistry • Engineering • Life Sciences



Vaccinating the World: Understanding ESRI's Contribution to the Global COVID Response



DR. ESTE GERAGHTY

Chief Medical Officer,
Environmental Systems
Research Institute, (ESRI)



BILL TUSZYŃSKI, PH.D

Principal,
The Unami Group LLC



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Vaccinating the World:

Understanding Esri's Contribution to Global COVID-19 Response

Este Geraghty, MD, MS, MPH, GISP
Chief Medical Officer, Esri

Joseph Priestley Society
Science History Institute
3/10/2022

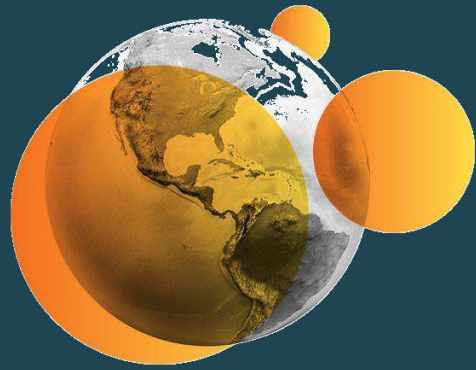
Overview

- Who is Esri?
- What is GIS and how is it used in health?
- The GIS and COVID-19 response story



“Esri is the rare business that has survived at least five tectonic shifts in technology...and remains at the top of its game.”

—Miguel Helft, Forbes



WHO WE ARE

Esri builds the most powerful mapping and spatial analytics products in the world.

“Esri’s data-rich maps are the secret weapon behind many of today’s most successful brands.”
-Fast Company

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

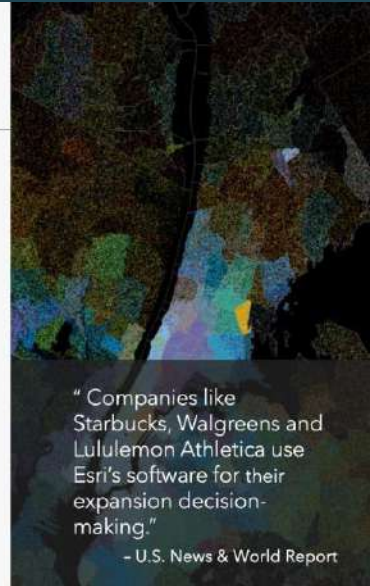
BY THE NUMBERS

Every Year:

- Esri software is used by **90** of the Fortune 100 companies and half of the Fortune 500 companies
- **All 50** US state governments, **all** the most populous cities in the US, **all 15** executive departments and **dozens** of independent US agencies
- **87** of the Forbes Top 100 colleges in the US serving over **250,000** students in higher education
- We spend **30%** of our revenue on R&D

Every Day:

- The Living Atlas of the World, the largest collection of global geographic information gets more than **1 billion** views of maps and datasets
- More than **142,000** people interact with Story Maps, an app that integrates maps and stories to reveal meaning and context from complex data
- Our business, government, and NGO customers create more than **15,000** ArcGIS Online maps, layers, and apps



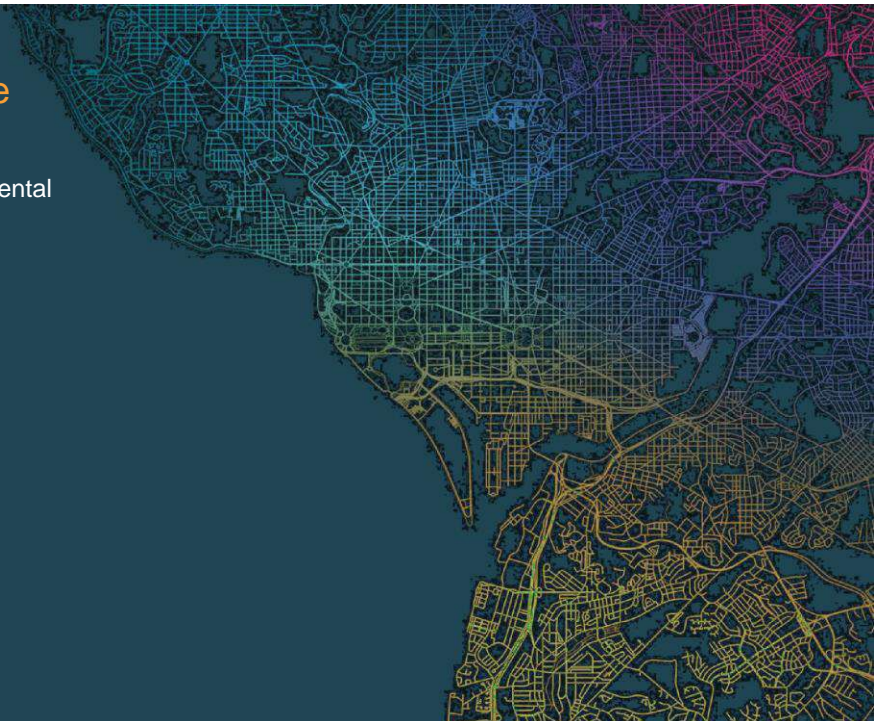
"Companies like Starbucks, Walgreens and Lululemon Athletica use Esri's software for their expansion decision-making."

- U.S. News & World Report

The Science of Where

Helps us to answer the fundamental questions of where . . .

- Where is it
- How do I get there
- What's nearby
- Where are we going
- Where's the problem
- Where is it changing
- Where is the issue
- Where is it suitable
- Where should we locate



Geography is the Science of Our World

... Providing Content and Context

... And a Common Reference System

Helping Us See ... Complexity ...

... Relationships, Patterns and Associations

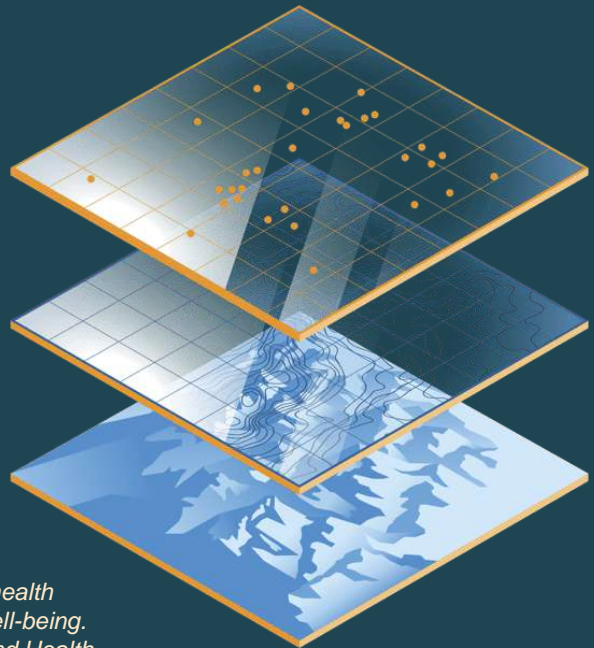
... Bringing It All Together

Helping Us Understand ...

... And Intelligently Respond



What is GIS?



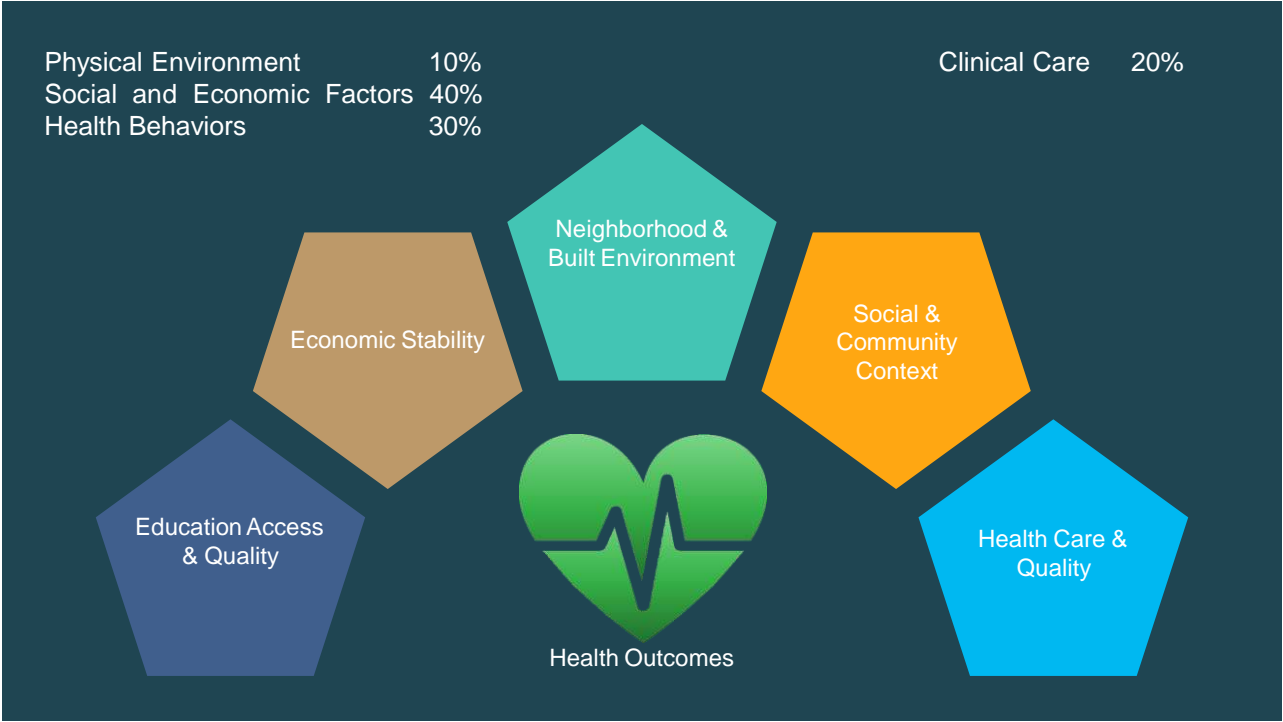
*The places of our lives – affect the quality of our health
and influence our experience with disease and well-being.
-CDC, Place and Health*

At Esri, we believe people can do amazing things with applied geography.



Shift focus to appreciate the big picture with a telescopic view





Our communities have a powerful impact

Our
environments
influence
our personal
behaviors



Make the healthy choice the easy choice

Our
environments
shape how we
see our world



Our perception is based on our context



YOUR ZIP CODE > GENETIC CODE

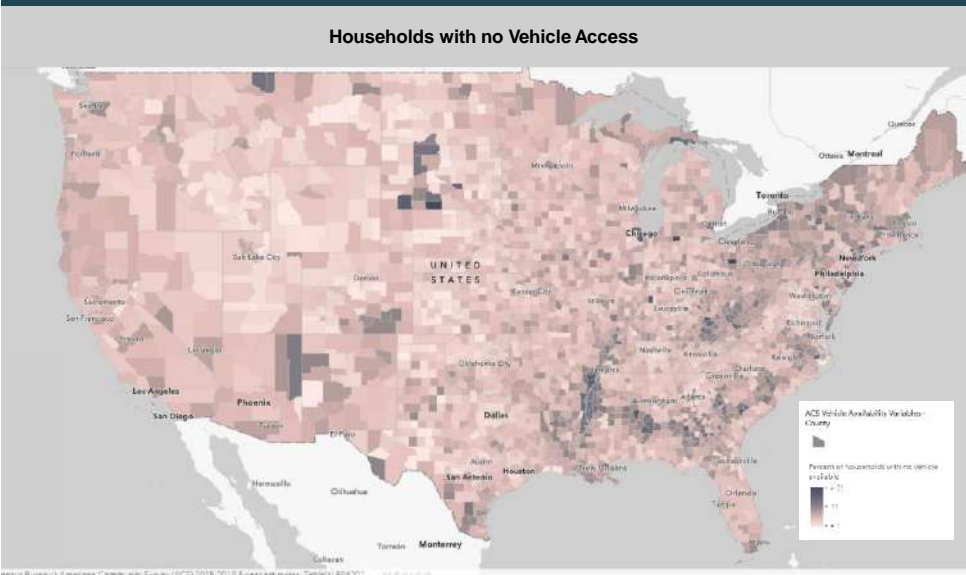


The first step
for a diabetic
patient to be
able to take
their
medications...



Access to Care

...is having the transportation to go and get them



Access to Care

...is having the transportation to go and get them

Maybe its not
the will to eat
better that's
scarce...



...but rather its
access to
grocery stores
that's out of
reach



Wholesome food or food dessert?

...but rather its
access to
grocery stores
that's out of
reach



Wholesome food or food dessert?

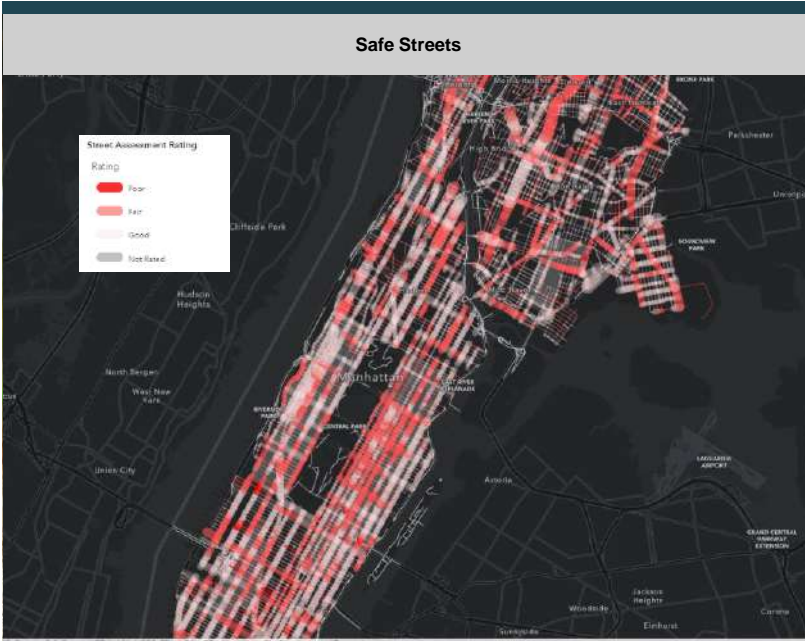


Not every
community will
have a fancy
gym...



Safe places for physical activity

...but we know that the population can flourish when simple sidewalks are available.



Safe places for physical activity

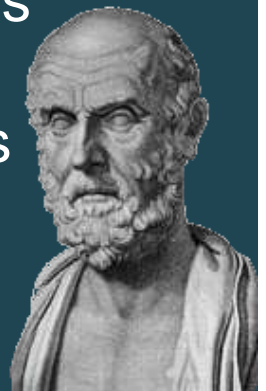
...but we know that the population can flourish when simple sidewalks are available.



Place Matters for Health!

Place Matters in Health

WHERE people live and the environments around them, has a significant impact on their personal health and outcomes

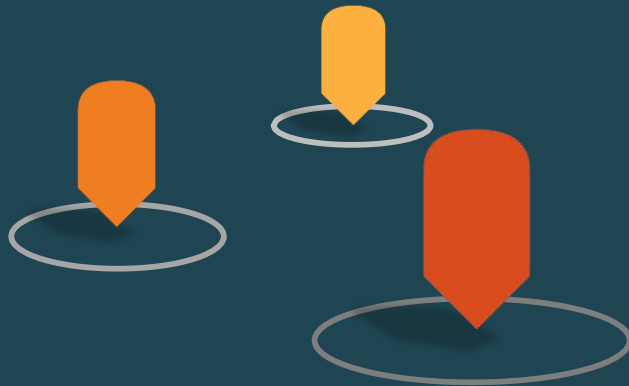


Hippocrates, 460 BC

WHERE are things?



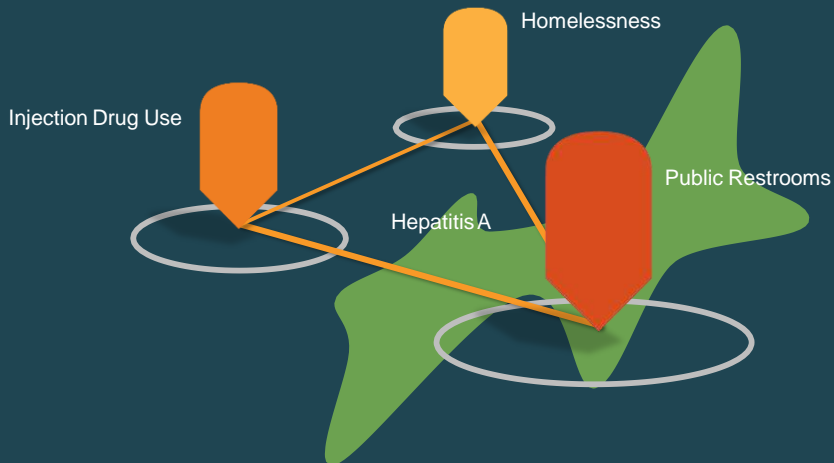
WHAT is nearby?



HOW are things connected?

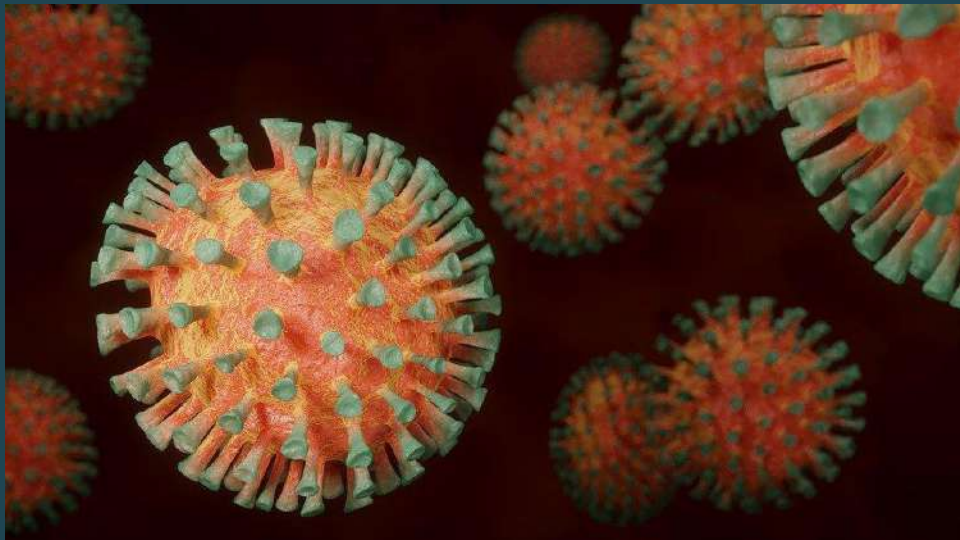
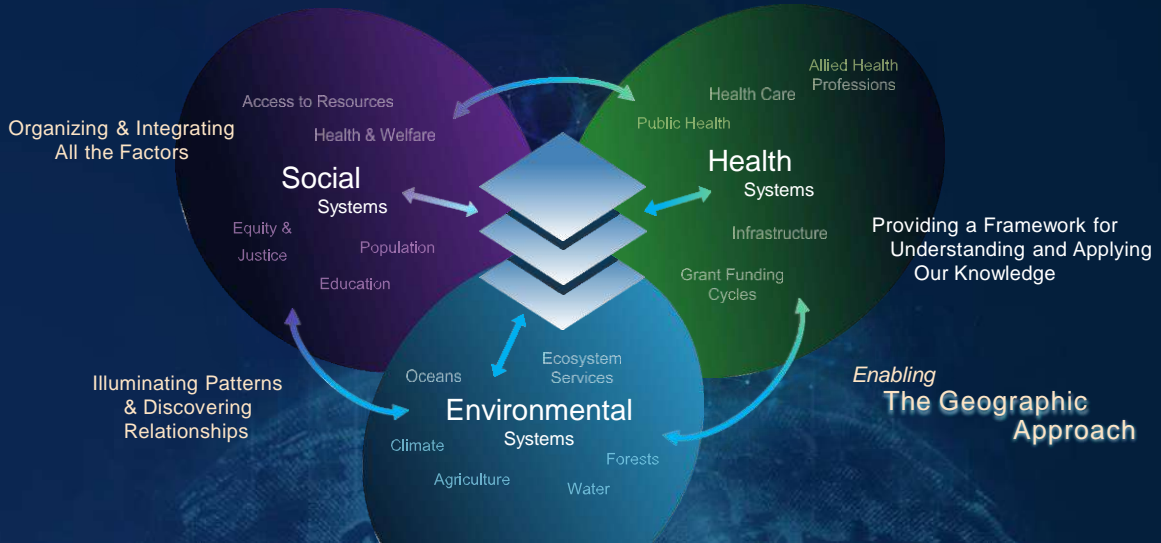


WHEN and WHERE are things affected by other things?



A Healthy Future Requires . . . We See the World as One Single Ecosystem

Geography Provides the Science & Language to Do This



How GIS supports pandemic response:

Situational Awareness

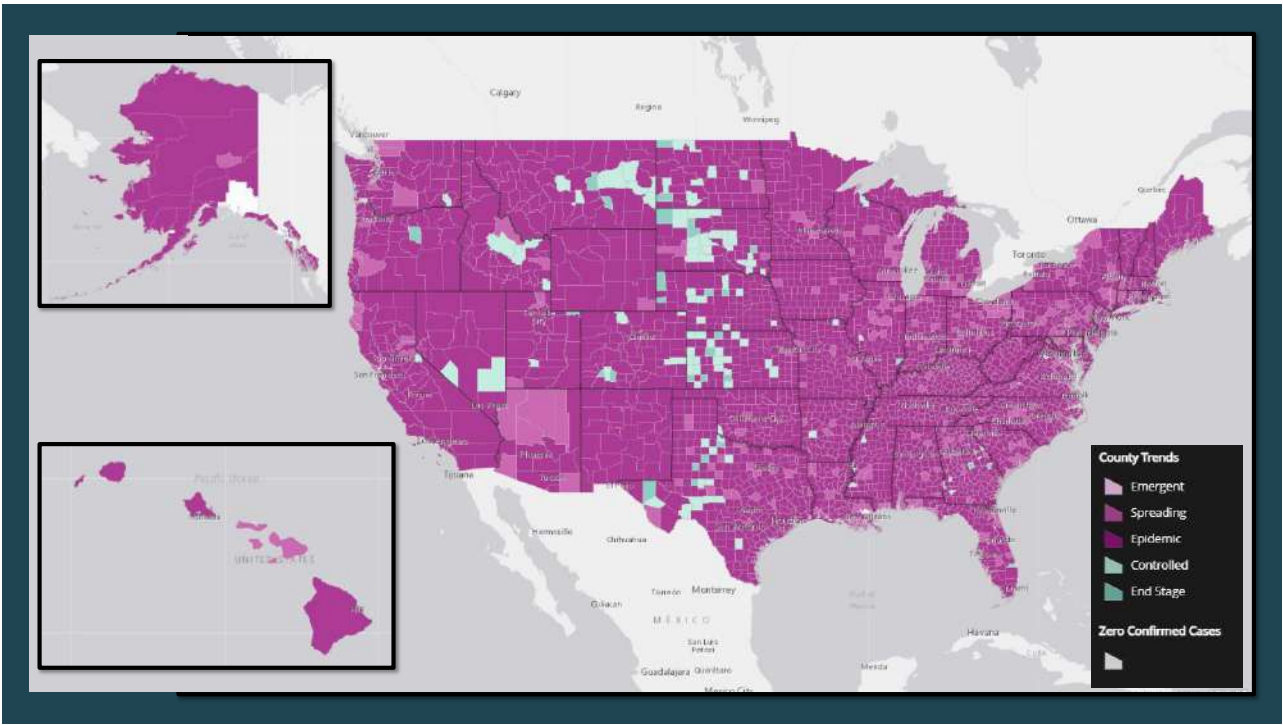
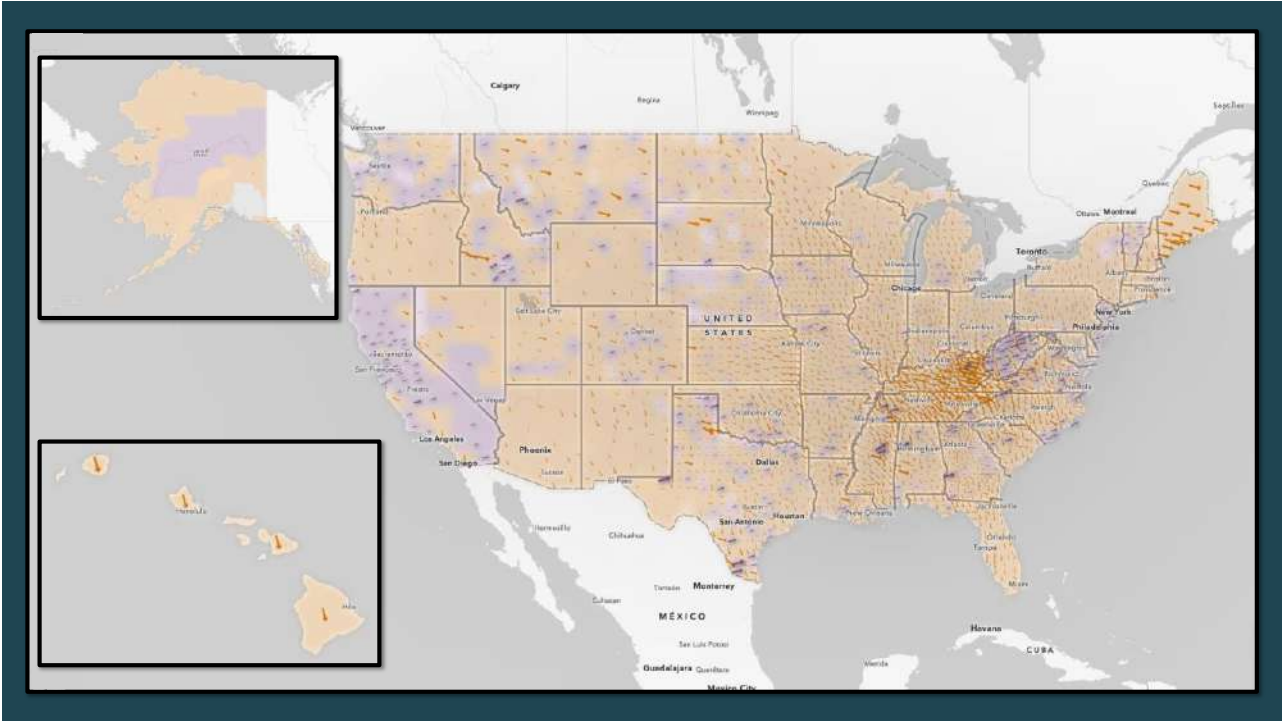
Spatial Analysis & Equity

Engagement

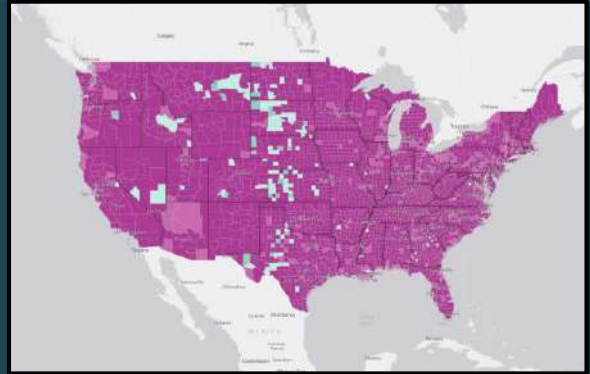
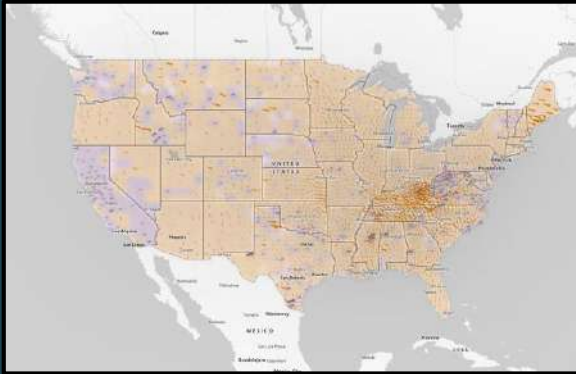
How GIS supports pandemic response:

Situational Awareness

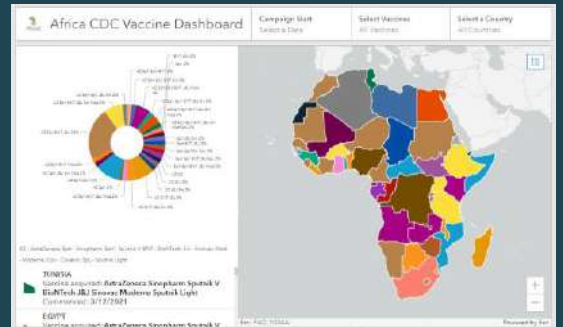
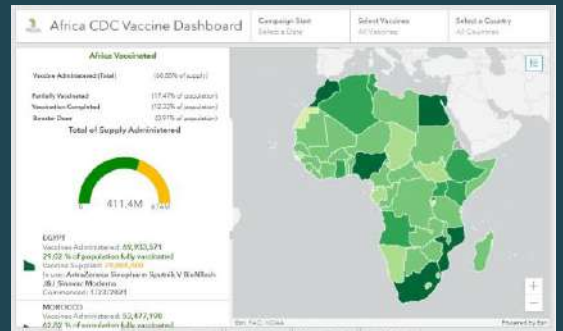
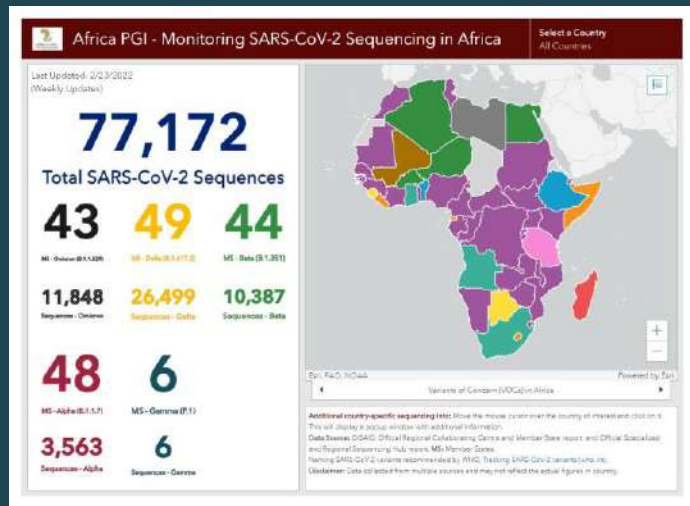


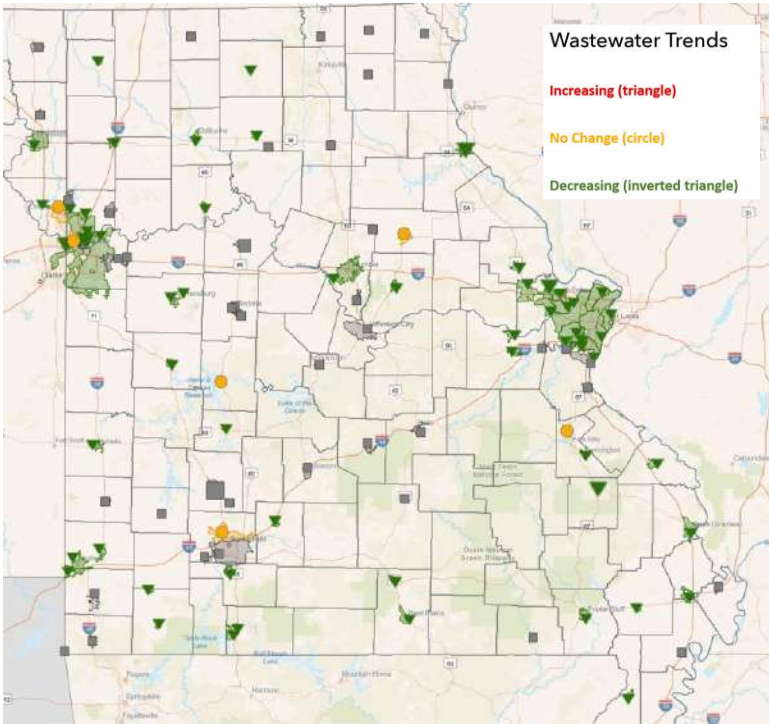


Better \neq Good



Sharing vaccine, genomic and variant information with the world





How GIS supports pandemic response:

Spatial Analysis & Equity

Social Distancing and Points of Interest



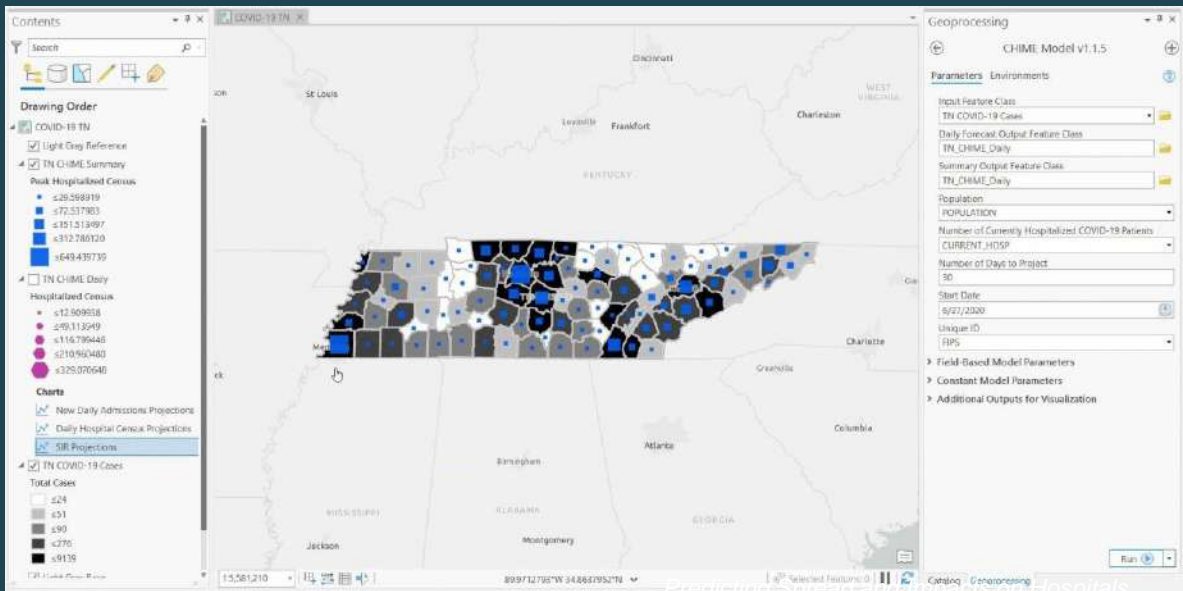
Unacast



Safe Graph

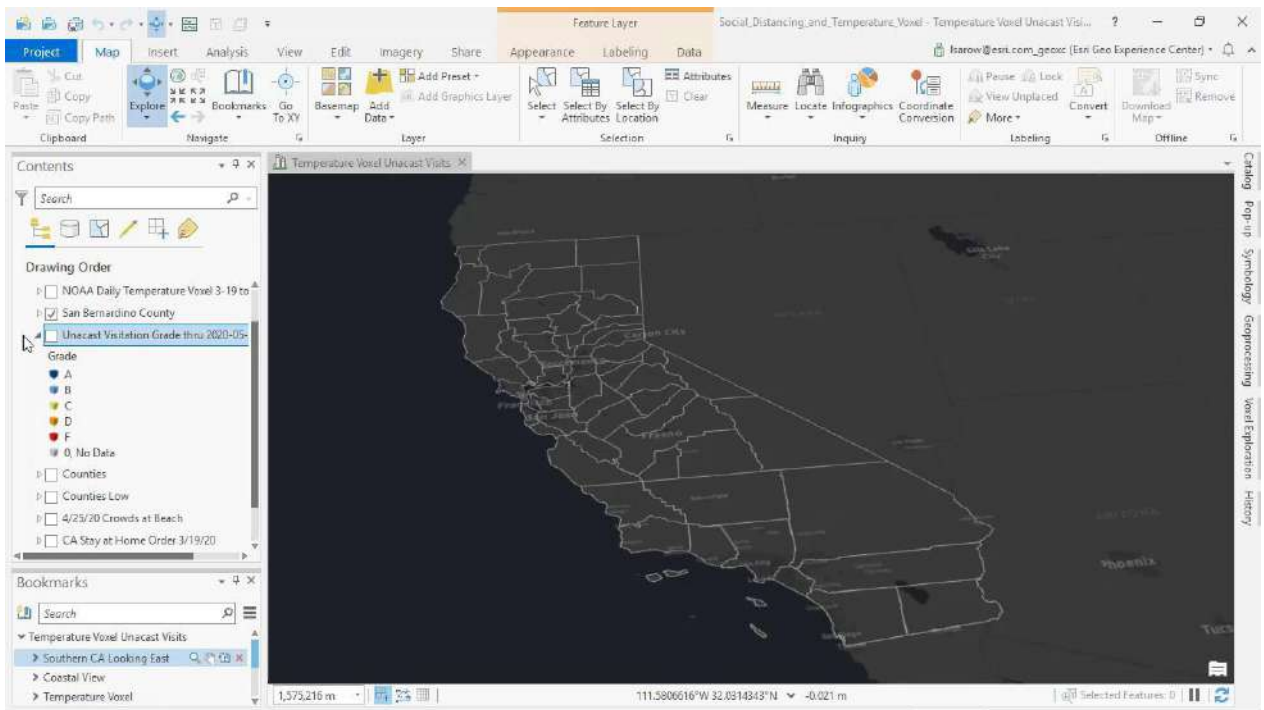
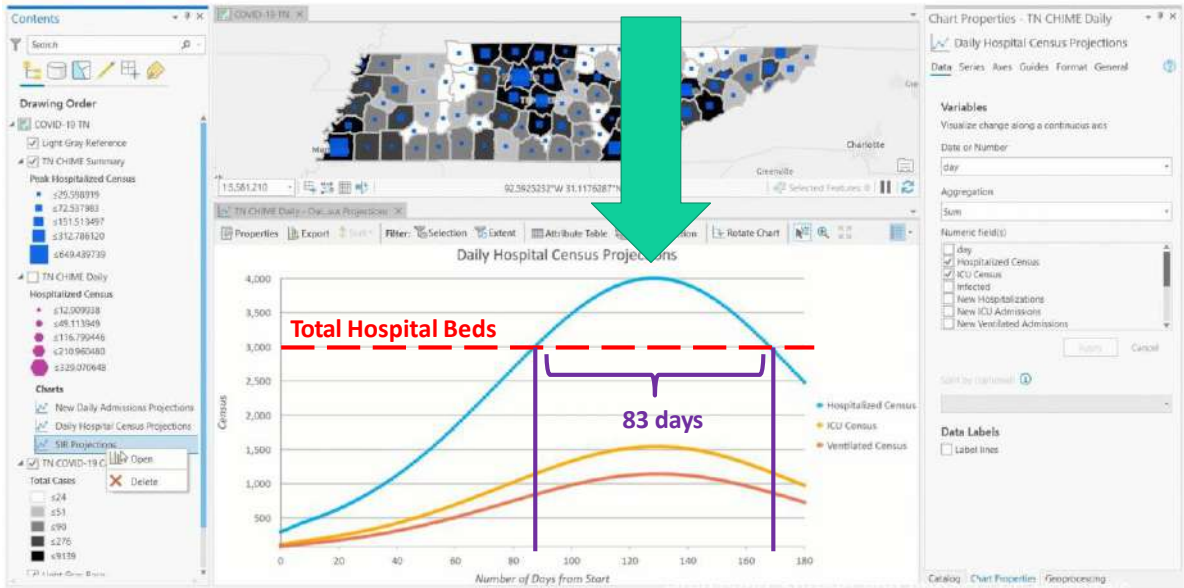


Analyzing capacity to determine your ability to respond



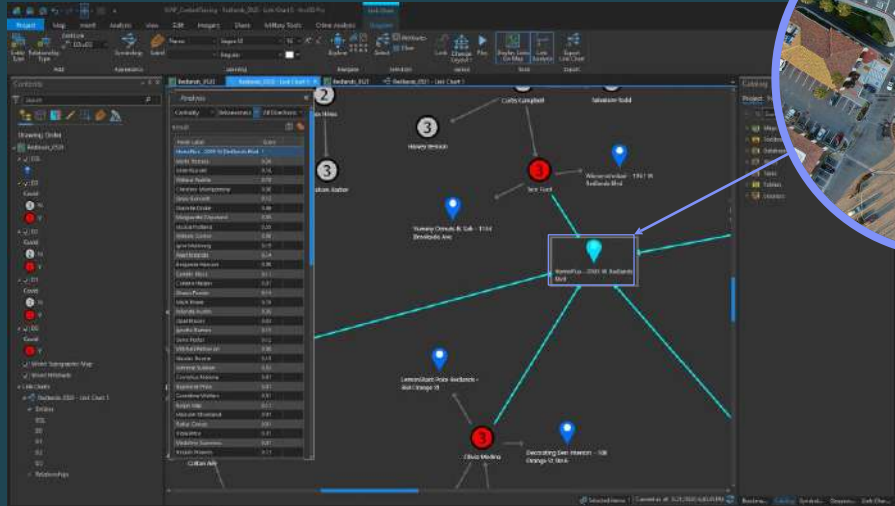
Modeling Spread and Impacts on Hospitals

Analyzing capacity to determine your ability to respond



Understand Connections

Perform Link Analysis & Apply Graph Theory



Showing Person-to-Person-to-Place Connection

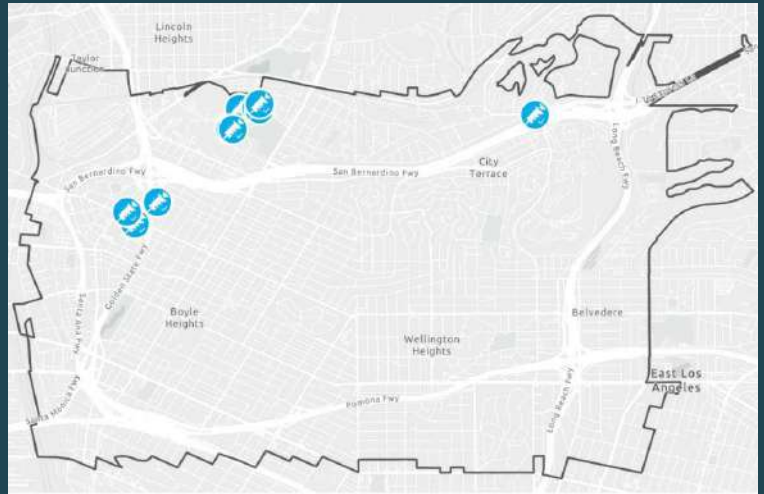


New Resources Needed

Vaccine Coverage Analysis Solution

Increasing access where its needed most

- 1. Start with existing vaccination locations



Vaccine Coverage Analysis Solution

82.9% covered

Increasing access where its needed most

- 2. Determine acceptable level of access

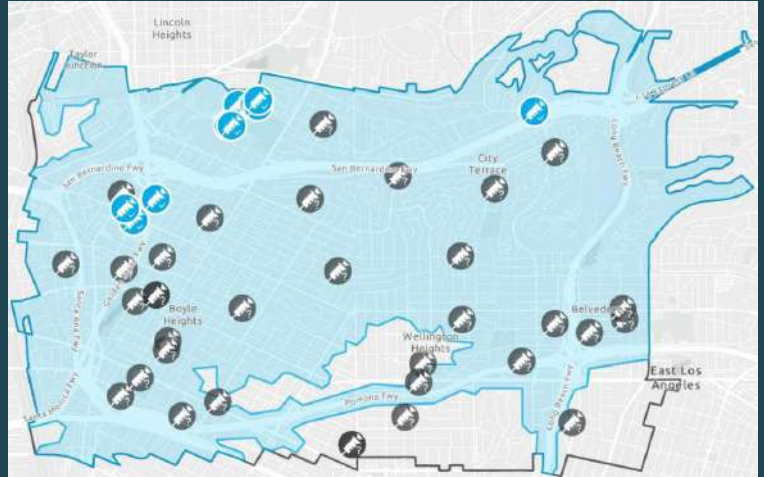
First output: percentage of the total population within reach of a vaccination site.



Vaccine Coverage Analysis Solution

Increasing access where its needed most

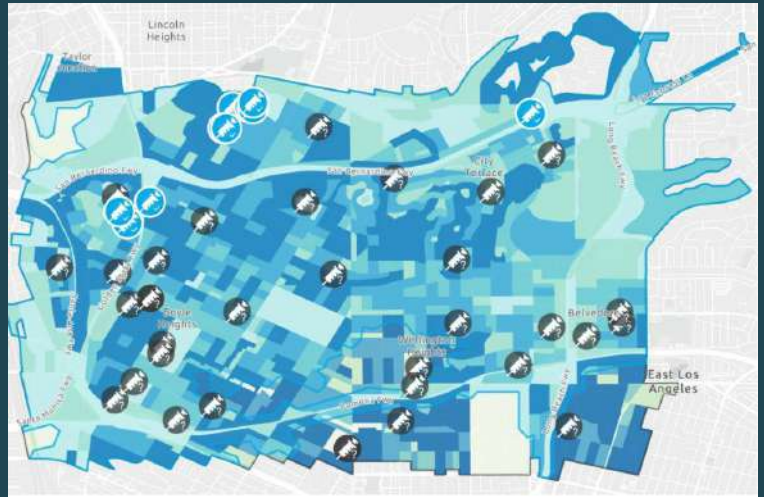
- 3. Collect and map candidate vaccination sites to fill gaps



Vaccine Coverage Analysis Solution

Increasing access where its needed most

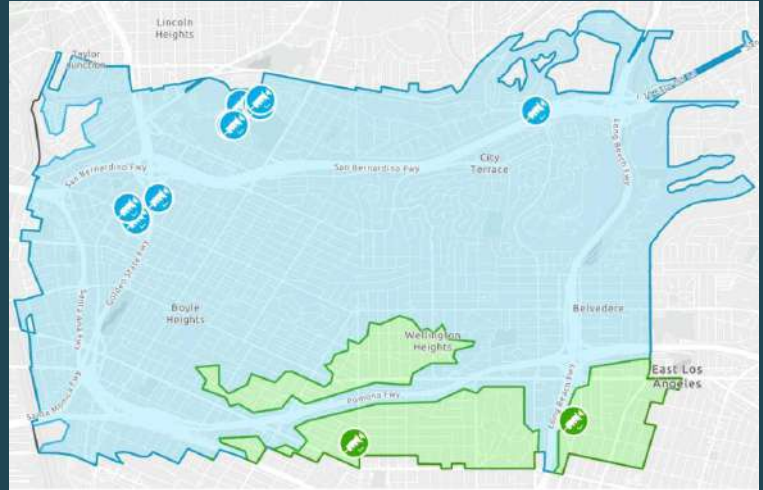
- 4. Add factors to weight results toward greater equity



Vaccine Coverage Analysis Solution

Increasing access where its needed most

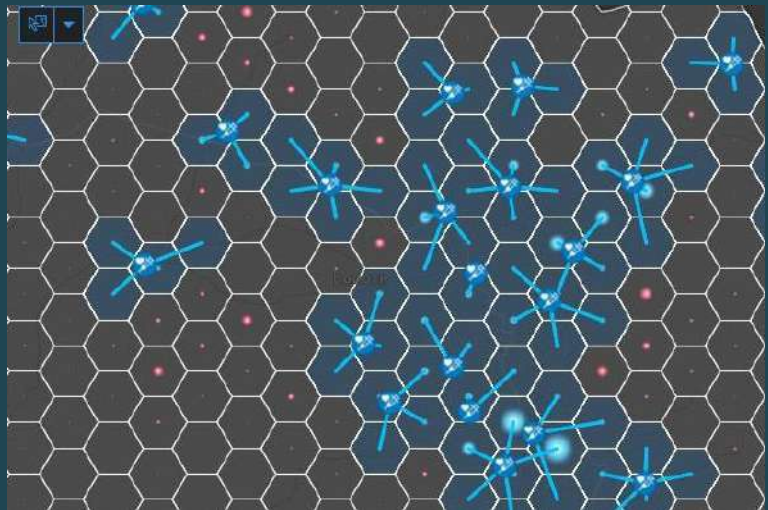
Final output: a selection of the fewest number of new vaccination sites that close geographic gaps while favoring the most vulnerable areas



Determine Gaps in Access | Formulate Alternative Distribution Options

Steps

- Calculate accessibility by using slope, landcover and elevation across small hex bins.
- Each hex bin has a level of difficulty to traverse.
- Each level of difficulty is associated with a travel time.



How GIS supports pandemic response:

Engagement

New York City Vaccine Locator

NYC's Vaccine Finder tool:
<https://vaccinefinder.nyc.gov/>

Key Capabilities:

- Find nearest vaccination site
- Filter by open appointments
- Connect directly with scheduling systems

The screenshot displays the NYC COVID-19 Vaccine Finder interface. On the left, a sidebar lists several vaccination sites with their addresses and appointment status. The main area shows a map of Manhattan with blue pins indicating the locations of these sites. A mobile phone overlay on the right shows a 'Vaccine Eligibility Survey' with the following content:

Vaccine Eligibility Survey

The Vaccine Eligibility Survey can be used to determine if you are currently eligible for a vaccine. As the vaccine becomes more available, eligibility will expand. If you are not eligible today, please check back regularly.

Are you a health care worker or a long term care facility resident?
 This includes individuals interacting with patients in a health care setting as well as residents or members associated with long term care facilities.

Yes No

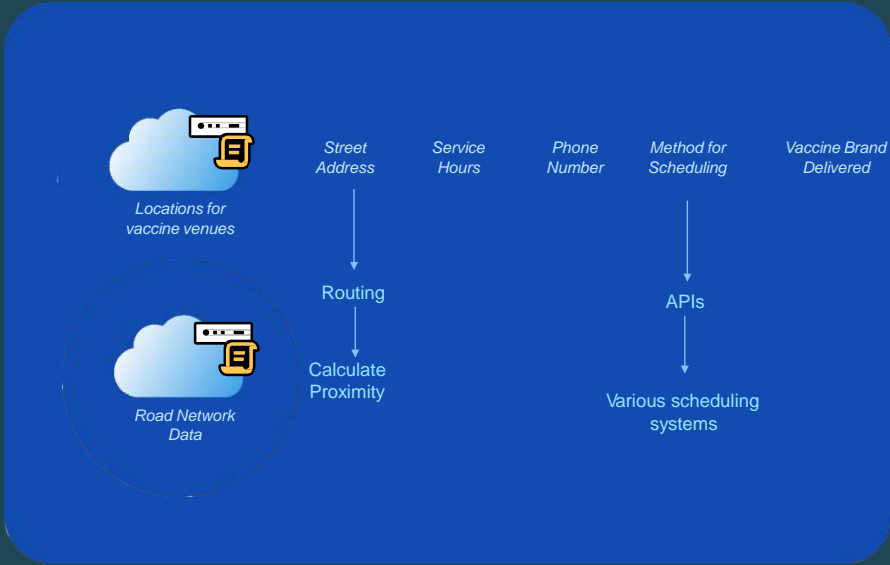
Are you an essential worker?
 This includes individuals in Education, Food & Agriculture, Utilities, Police, Firefighting, Corrections Officers, Transportation, etc.

Yes No

Based upon the information provided, you are eligible for the COVID-19 vaccine at this time. Please use the Vaccine Locator to find the nearest vaccination site.

Data Interconnectivity

NYC's Vaccine Finder tool:
<https://vaccinesfinder.nyc.gov/>

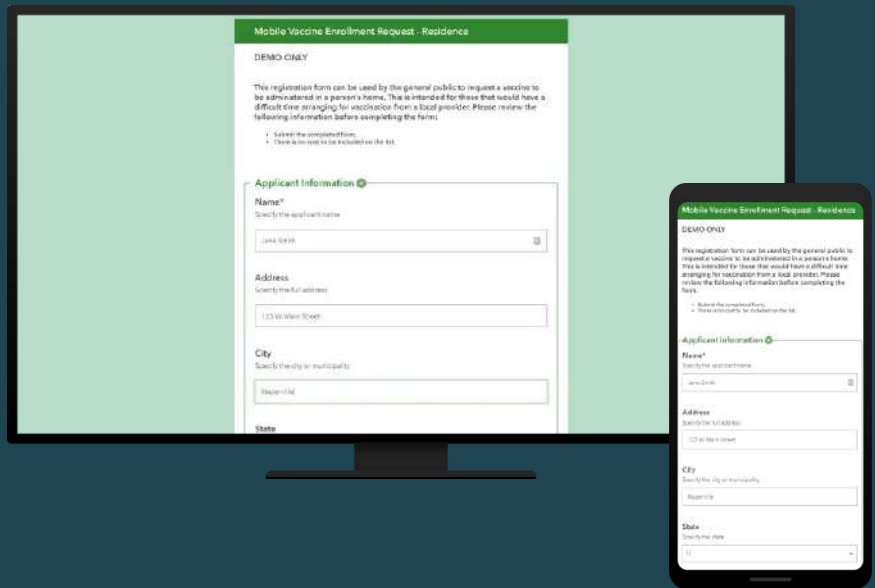


Identify Target Patients & Locations

Residents can sign up

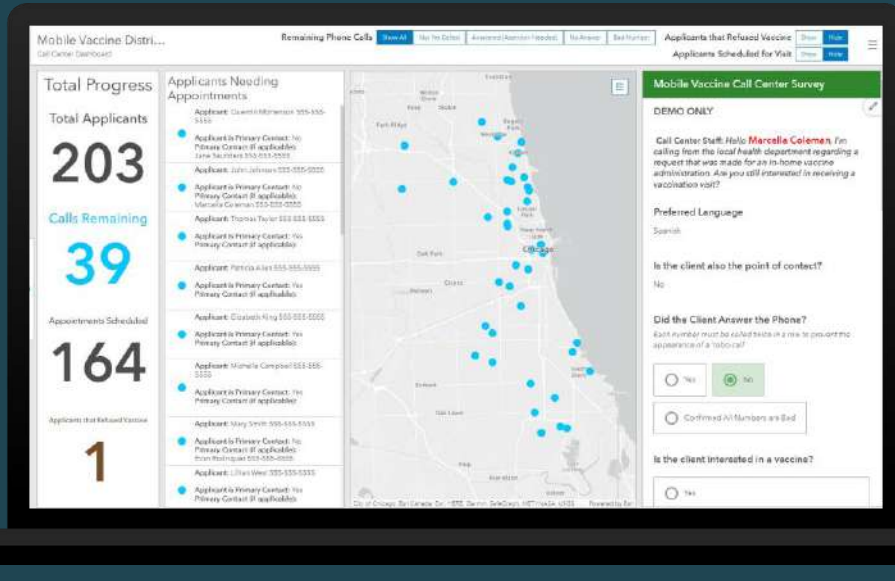
Who needs outreach:

- Police/fire department list of homebound
- HHS emPOWER data (electricity and health care dependent)
- Hospital EHRs
- HMIS (homeless)
- Fall into geographic gaps
- IIS (unvaccinated or no second dose)

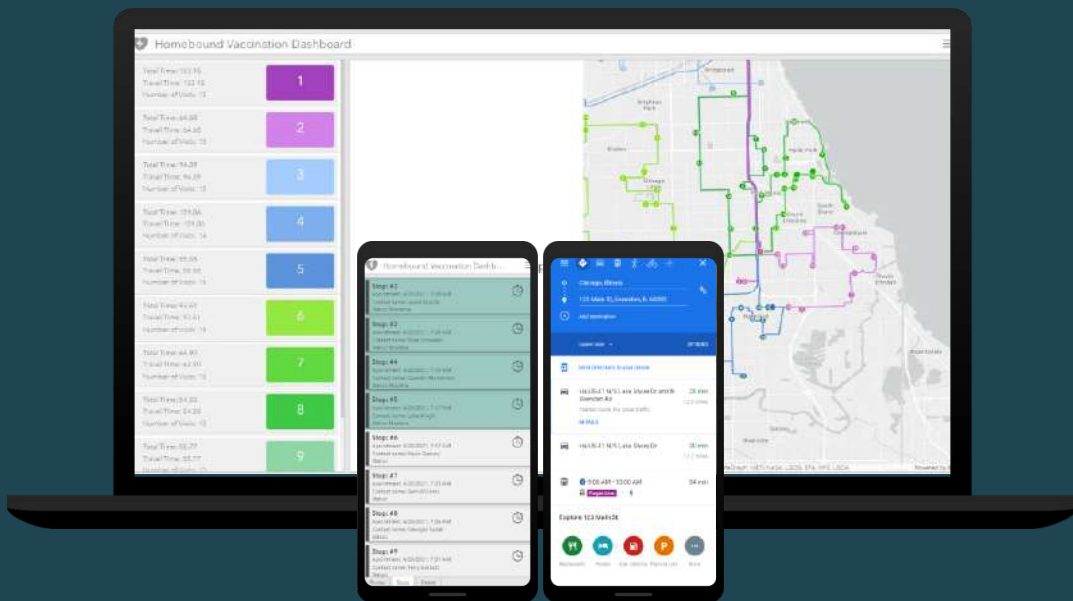


Identify Patients & Locations

Call Center Dashboard, Script and Survey Tool

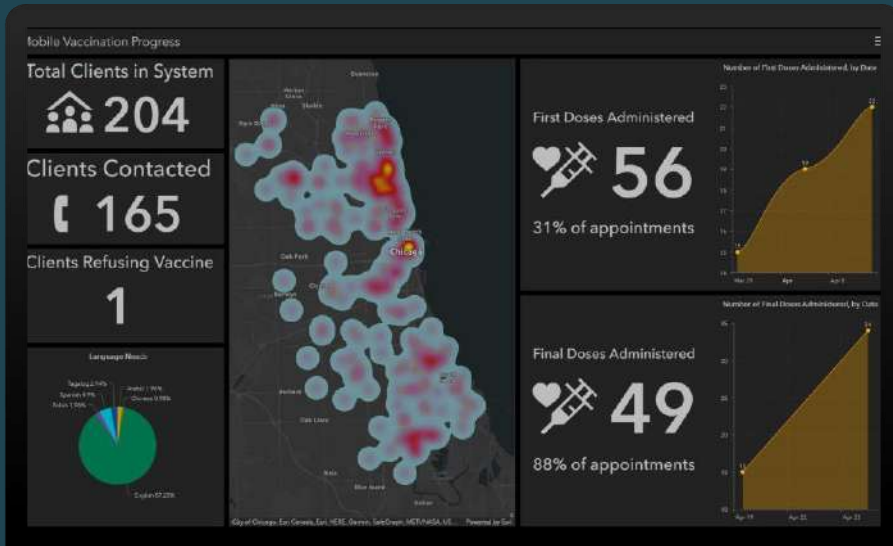


Outreach to homebound individuals



Monitor Progress

Dashboards Provide KPIs at a glance





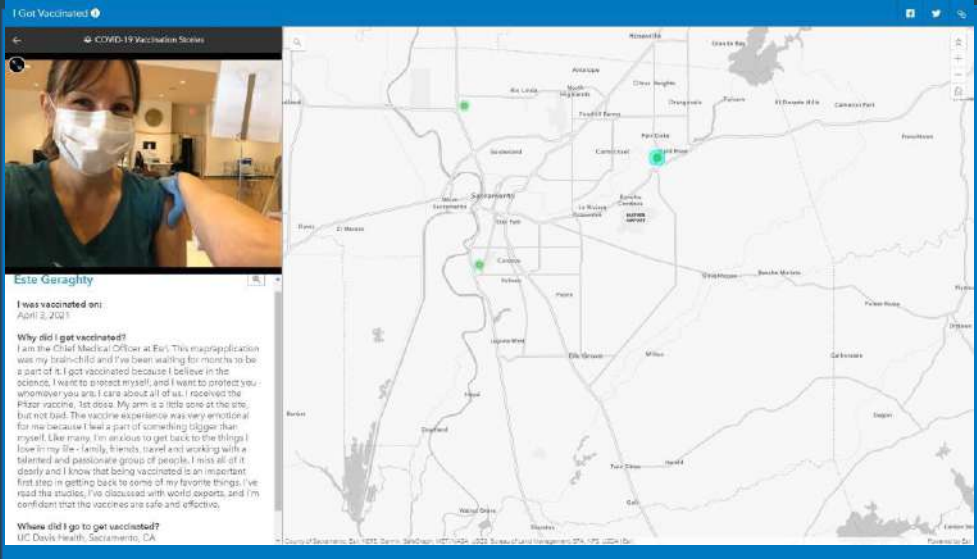
"I Got Vaccinated!" Story Map

<https://esriurl.com/IGotVaccinated>

The screenshot shows the 'I Got Vaccinated!' Story Map interface. On the left side, there is a grid of 12 user-submitted photos of people celebrating their vaccination. Some photos include text like 'as strong as the woman', 'MBF I'm COVID-19 VACCINATED', and 'CO'. On the right side, there is a world map with green circular markers indicating vaccination locations across various continents, including North America, Europe, and South America.

"I Got Vaccinated!" Story Map

<https://esriurl.com/IGotVaccinated>



Enrich Your View

Sentiment



Esri Data

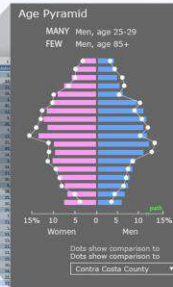
Attitudes

Research

Lifestyle

Channels

Hesitant, politically conservative, service job, uses Facebook



Confident, high education attainment, watches cable news

COVID-19 Rapid Community Assessment Guide



U.S. Vaccine Confidence Survey Question Bank¹
 Domain: **Demographic**

ITEM CONSTRUCT	(A) CORE ITEMS FOR ADULTS WHO HAVE NOT YET BEEN VACCINATED	(B) CORE ITEMS FOR ADULTS WHO HAVE BEEN VACCINATED	(C) CORE ITEMS FOR HCP WHO HAVE NOT YET BEEN VACCINATED	(D) CORE ITEMS FOR HCP WHO HAVE BEEN VACCINATED
1. Age	How old are you? _____ years	Same	Same	Same
2. Sex	What sex were you assigned at birth, on your original birth certificate? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Rather not say <input type="checkbox"/> I don't know	Same	Same	Same
3. Gender	Do you currently describe yourself as male, female, or transgender? <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Transgender <input type="checkbox"/> None of these _____	Same	Same	Same
4. Ethnicity	What is your ethnicity? <input type="checkbox"/> Hispanic or Latino <input type="checkbox"/> Not Hispanic or Latino <input type="checkbox"/> Other (Please specify): _____	Same	Same	Same

<https://www.cdc.gov/research/our-research/observational-research/vaccine-confidence-guide/downloads/CDC-VCA-Guide-2021-02B.pdf>

Digitized for efficiency, accuracy, and interoperability

U.S. Vaccine Confidence Survey Question Bank

Domain: Demographic

How old are you?

What sex were you assigned at birth, on your original birth certificate?

Do you currently describe yourself as male, female, or transgender?

Date and Time Question Appearance

During what month/year did you receive the first dose of COVID-19 vaccine?

MM/yyyy

Likert Question Appearance

Eat outside at a restaurant

Not at all likely Somewhat likely Extremely likely Not sure

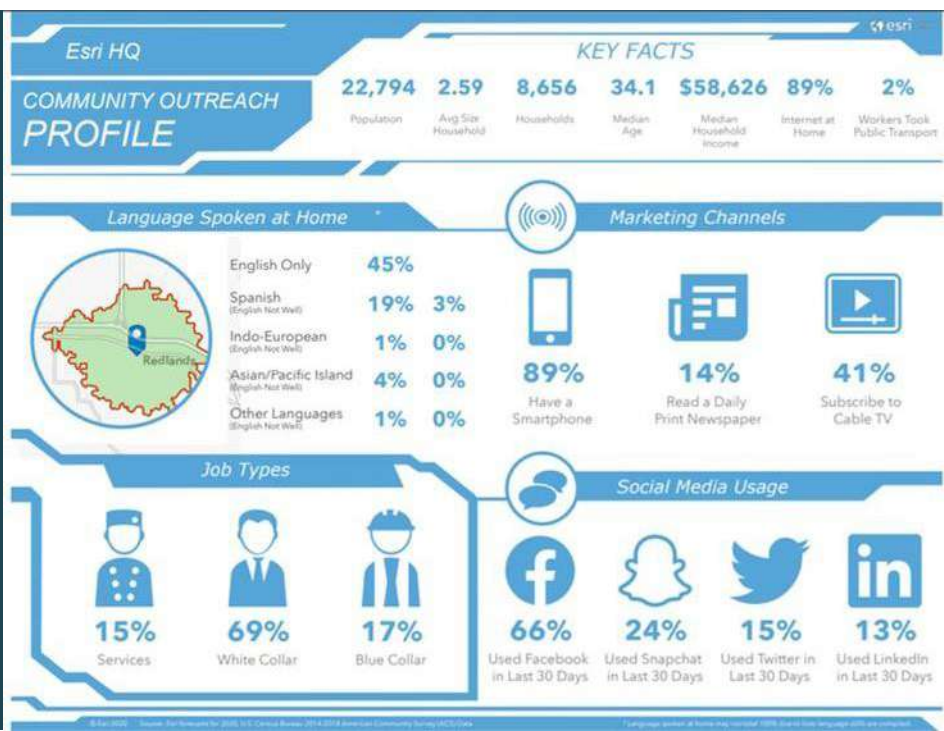
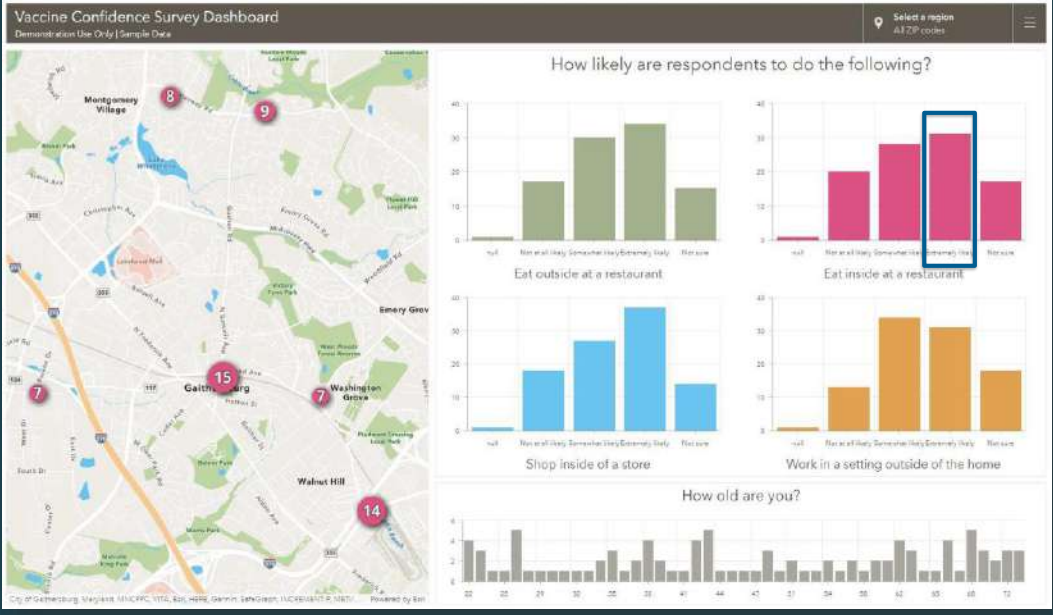
Location Capture

Would you be willing to share your ZIP code with us?

Yes No Unsure

Back Submit

Page 7 of 9



VACCINE AREA OVERVIEW
Crenshaw Blvd Mall
esri | Drive time of 10 minutes

Hospitals	Address	City	State	ZIP	Distance
Los Feliz Healthcare Ctr Lie	W Goldleaf Cir	Los Angeles	California	90056	2.3
Kindred Hospital-los Angeles	W Slauson Ave	Los Angeles	California	90056	
Kaiser Permanente West Los	Cadillac Ave	Los Angeles	California	90034	
Albury's Pediatric Health Ctr	E Regent St	Inglewood	California	90301	3.1

Closest 5 locations

Pharmacies	Address	City	ZIP	Employees	Distance
Stocker Rx Pharmacy	Santa Rosalia Dr	Los Angeles	90008	2	0.2
Wilshire Pharmcare Inc	Santa Rosalia Dr	Los Angeles	90008	4	0.2
Garfield Prescription Pharmacy	Santa Rosalia Dr	Los Angeles	90008	20	0.2
Albertsons Sav-on Pharmacy	Crenshaw Blvd	Los Angeles	90008	2	0.4

Closest 65 locations

Faith Groups	Address	City	ZIP	Employees	Distance
St Bernadette Parish	Don Felipe Dr	Los Angeles	90008	4	0.4
Agape La	Crenshaw Blvd	Los Angeles	90043	3	0.5
Personal Ministry Inc	S Norton Ave	Los Angeles	90008	3	0.6
Baka Yaad Global Ministry	6th Ave	Los Angeles	90008	3	0.6

Closest 64 locations

459,055 Population	151,947 Households	2.96 Avg Size Household
34.6 Median Age	\$47,668 Median Household Income	\$599,475 Median Home Value
60 Wealth Index	46 Housing Affordability	90 Diversity Index

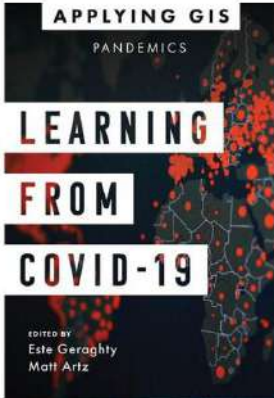
How GIS supports pandemic response:

Situational Awareness

Spatial Analysis & Equity

Engagement

Available for Pre-Order, Publication date 05/31/22



Learning from COVID-19: GIS for Pandemics

By Este Geraghty, Matt Artz

Learning from COVID-19: GIS for Pandemics explores a collection of real-life case studies about how organizations across the globe have successfully used GIS to respond to the COVID-19 pandemic.

Purchasing options



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Place Matters for Health!

Este Geraghty, egeraghty@esri.com

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