



U.S. National
Library of
Medicine

Community Health Maps

Information on Low Cost Mapping Tools for Community-based Organizations

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Center for
Public Service
Communications

Empowering competent enthusiastic people to do good things



A Project of: The National Library of Medicine



- Part of the National Institutes of Health (NIH)
- NLM → Division of Specialized Information Services → Outreach and Special Populations Branch
 - Their Mission: Seek to improve access to quality and accurate health information by underserved and special populations



Our Goal

Empower community organizations who:

- Focus on vulnerable populations
- Frequently use and collect data
- Need effective, scalable & easy to use mapping tools
- Lack resources (i.e., for proprietary GIS training & software)

How We Work

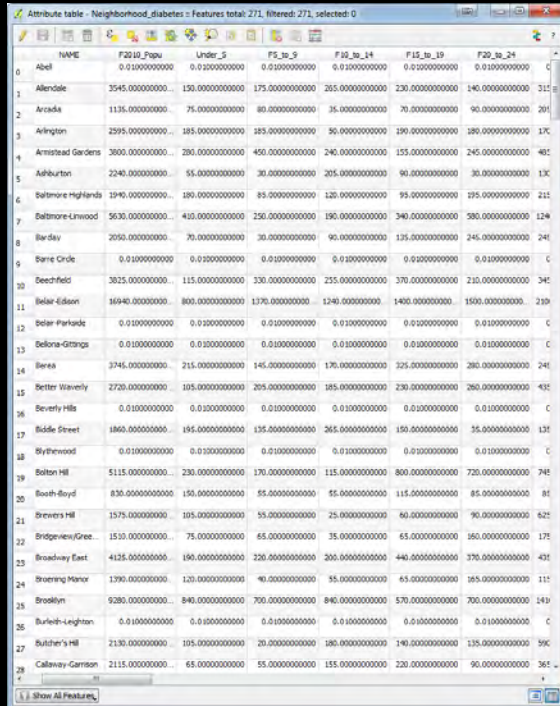
- Give presentations
- Conduct workshops
 - Train the trainer
- Provide resources
 - Blog
 - Lab exercises
 - Consultation
- Empower you to collect, analyze and manage your own community mapping data

CHM Workflow Permits & Encourages Interoperability

- Community Health Maps (CHM) focuses on low cost and open source tools.
- Data created using **Fulcrum** or **QGIS** can be easily brought into Esri's **ArcGIS** software
- Data created with **Esri** tools can also be brought into **QGIS** or **Carto**.
- QGIS can work with shapefiles, Esri personal and file geodatabases, KML and over 100 other formats!

What is GIS???

Databases: Useful but not easy to interpret



Attribute table - Neighborhood_diabetes = Features total: 271, filtered: 271, selected: 0

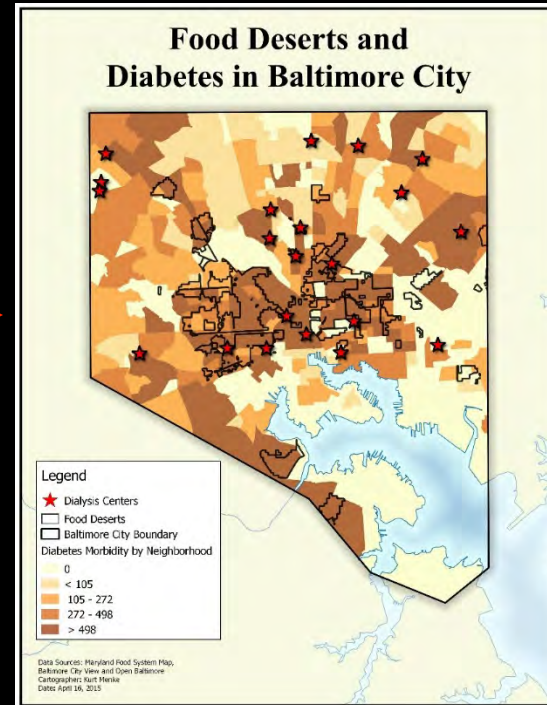
	NAME	F2010_Popu	Under_5	F5_to_9	F10_to_14	F15_to_19	F20_to_24	
0	Abel	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
1	Alendale	3545.00000000	150.00000000	175.00000000	205.00000000	230.00000000	140.00000000	312
2	Arvada	1116.00000000	75.00000000	80.00000000	35.00000000	70.00000000	40.00000000	201
3	Arlington	2595.00000000	185.00000000	185.00000000	30.00000000	150.00000000	180.00000000	17C
4	Arrested Gardens	3000.00000000	280.00000000	450.00000000	240.00000000	155.00000000	245.00000000	40C
5	Ashburton	2240.00000000	55.00000000	30.00000000	205.00000000	90.00000000	30.00000000	13C
6	Baltimore Highlands	1940.00000000	180.00000000	85.00000000	120.00000000	95.00000000	195.00000000	215
7	Baltimore-Linwood	5630.00000000	410.00000000	250.00000000	190.00000000	340.00000000	580.00000000	124
8	Bardav	2050.00000000	70.00000000	30.00000000	90.00000000	135.00000000	245.00000000	241
9	Barr Circle	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
10	Beachfield	3025.00000000	115.00000000	130.00000000	235.00000000	370.00000000	210.00000000	34C
11	Belair Edison	1640.00000000	800.00000000	1370.00000000	1240.00000000	1430.00000000	1500.00000000	210
12	Belair Parkside	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
13	Belkora-Gittings	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
14	Berea	3745.00000000	215.00000000	145.00000000	170.00000000	325.00000000	260.00000000	241
15	Better Waverly	2720.00000000	105.00000000	205.00000000	185.00000000	230.00000000	260.00000000	43C
16	Beverly Hills	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
17	Biddle Street	1860.00000000	195.00000000	135.00000000	265.00000000	150.00000000	35.00000000	131
18	Bytewood	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
19	Bolton Hill	5115.00000000	230.00000000	170.00000000	115.00000000	800.00000000	720.00000000	74C
20	Booth-Boyd	830.00000000	150.00000000	55.00000000	55.00000000	115.00000000	85.00000000	81
21	Brewers Hill	1575.00000000	105.00000000	55.00000000	25.00000000	60.00000000	90.00000000	62C
22	Bridgeview/Gree...	1510.00000000	75.00000000	65.00000000	35.00000000	65.00000000	160.00000000	171
23	Broadway East	4125.00000000	180.00000000	230.00000000	205.00000000	440.00000000	370.00000000	431
24	Brooming Manor	1790.00000000	120.00000000	40.00000000	85.00000000	65.00000000	165.00000000	111
25	Brooklyn	9280.00000000	840.00000000	700.00000000	840.00000000	570.00000000	700.00000000	143
26	Burket-Leighton	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	0.0100000000	C
27	Bulfinch's Hill	2130.00000000	105.00000000	20.00000000	180.00000000	140.00000000	135.00000000	59C
28	Calhoun Garrison	2115.00000000	65.00000000	55.00000000	155.00000000	220.00000000	90.00000000	361

A Picture is Worth a 1,000 Words

Data on a map = intuitive

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Why GIS Matters

- Location, location, location
- Everything happens somewhere



80%

of all information
has a **geographic** component



Answer Spatial Questions

Where...? What is nearby?

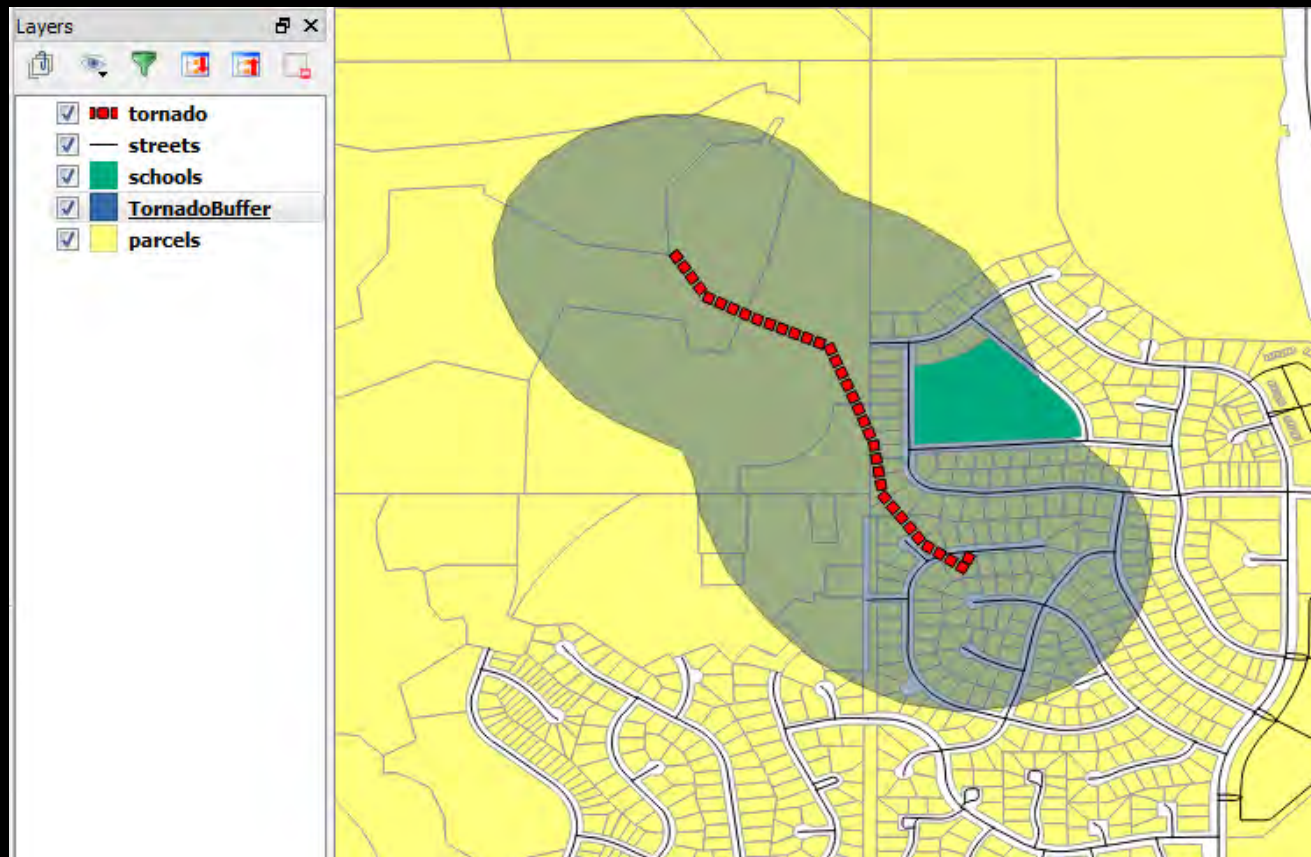


Answer Spatial Questions

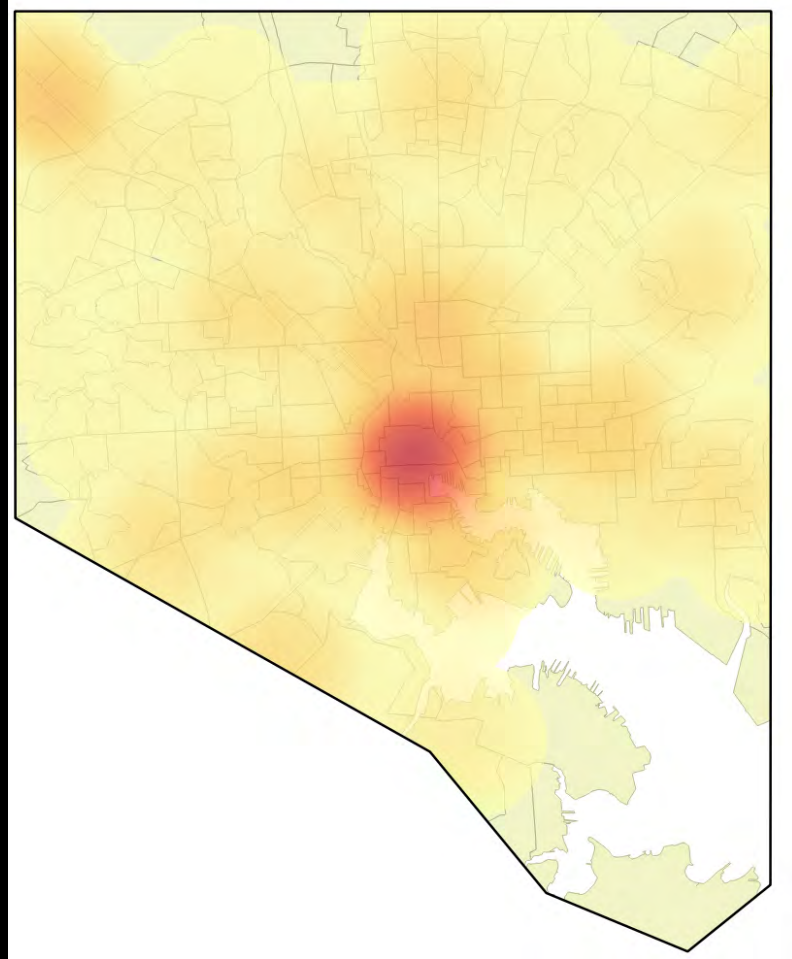
How Far?



What's within one mile?



What is
the
density?



This all
sounds great!
How can I do
that?



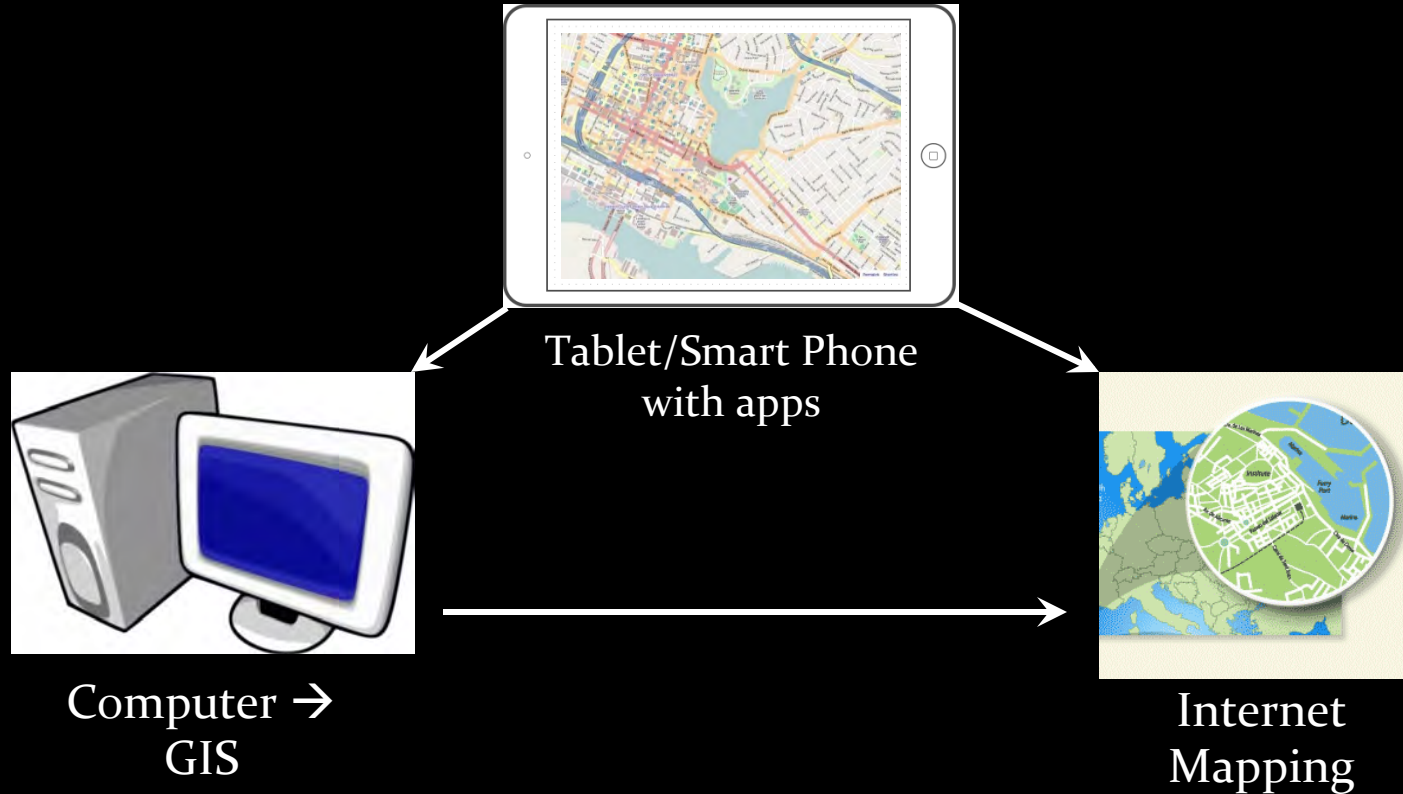
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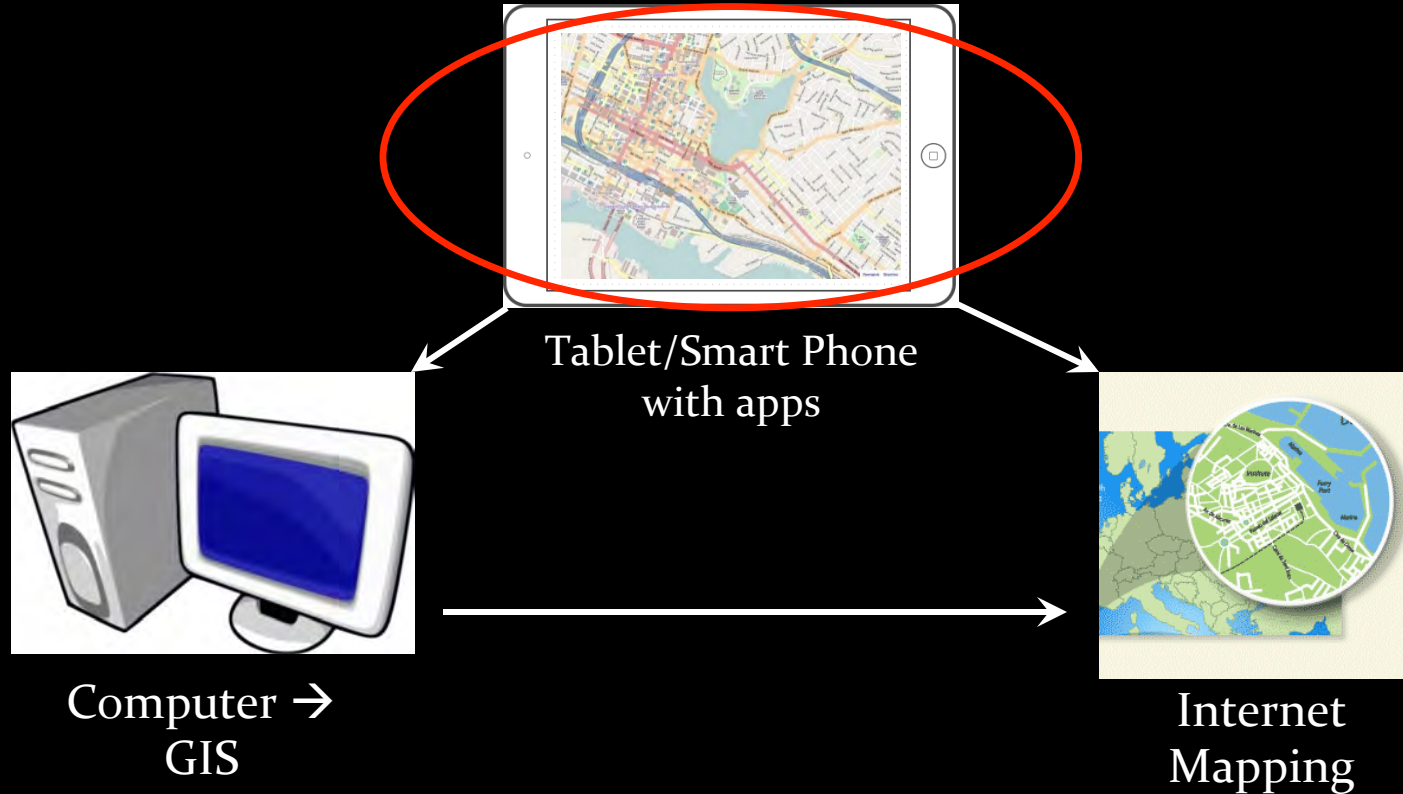
Information on Low Cost Mapping Tools for Community-based Organizations



The Community Health Mapping Workflow



The Community Health Mapping Workflow



Field Hardware

- Sub-centimeter accuracy isn't needed
- Use these



Not these



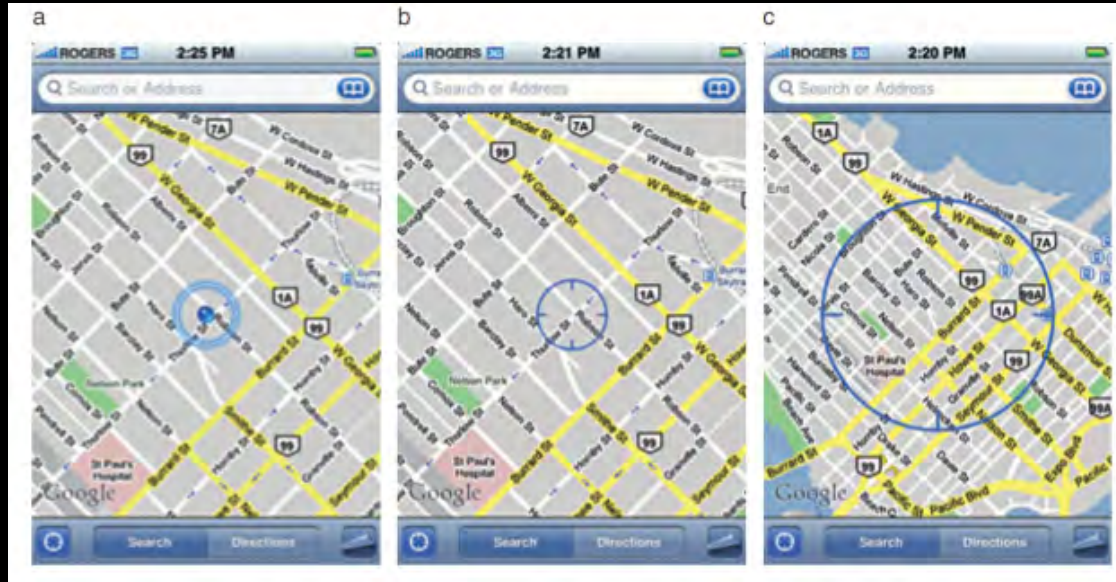
Tablets and Smart phones

- Most already have them!
- Intuitive interface
- Portable
- GPS receiver (iPhone 5 uses GPS + GLONASS)
- Camera
- Wireless networks
- Web
- Email
- Apps



Smartphone Accuracy

A-GPS Hybrid Positioning
WiFi Cellular positioning



8 meters

~ 74 meters

~ 600 meters

Increasing Accuracy

Today smartphone 3-5 meters

- Can use a 3rd party Bluetooth GPS with your device



Bad Elf ~ \$599
1-2 meter accuracy

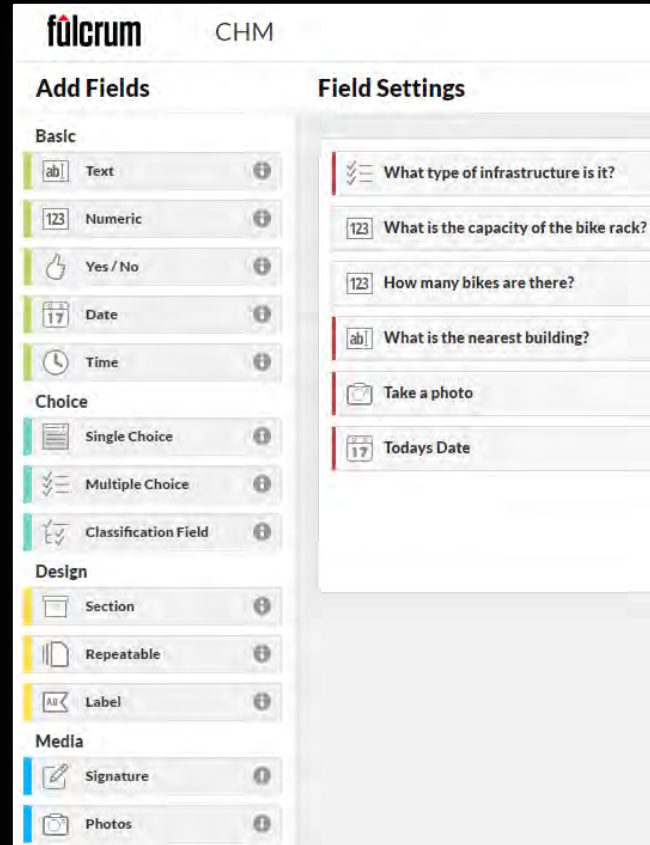


Dual 105S ~ \$100
2.5 meter accuracy

Fulcrum

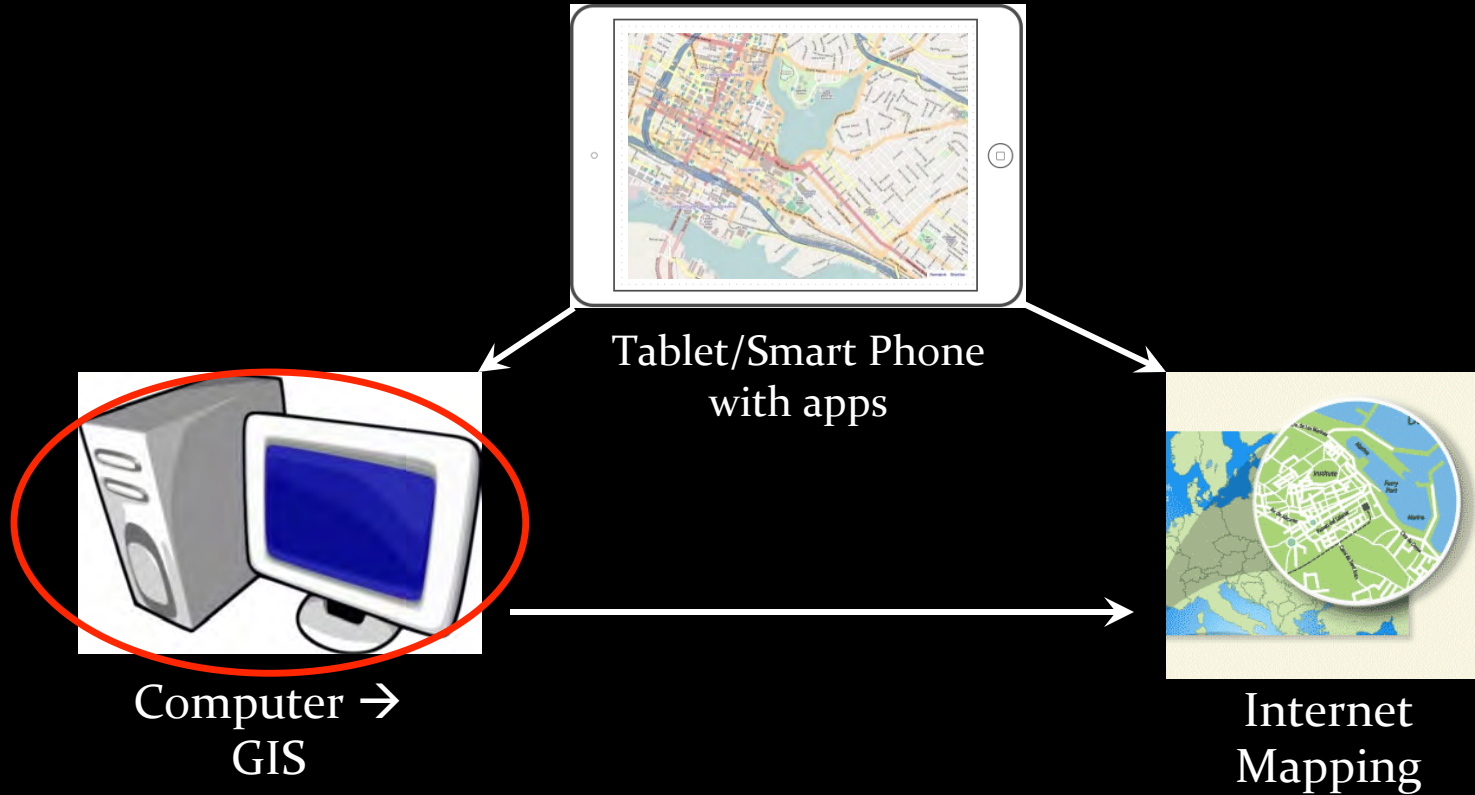
<http://www.fulcrumapp.com/>

- Custom forms
- iOS and Android
- Low monthly subscription



How could
mapping tie
into your
program?

The Community Health Mapping Workflow



Desktop

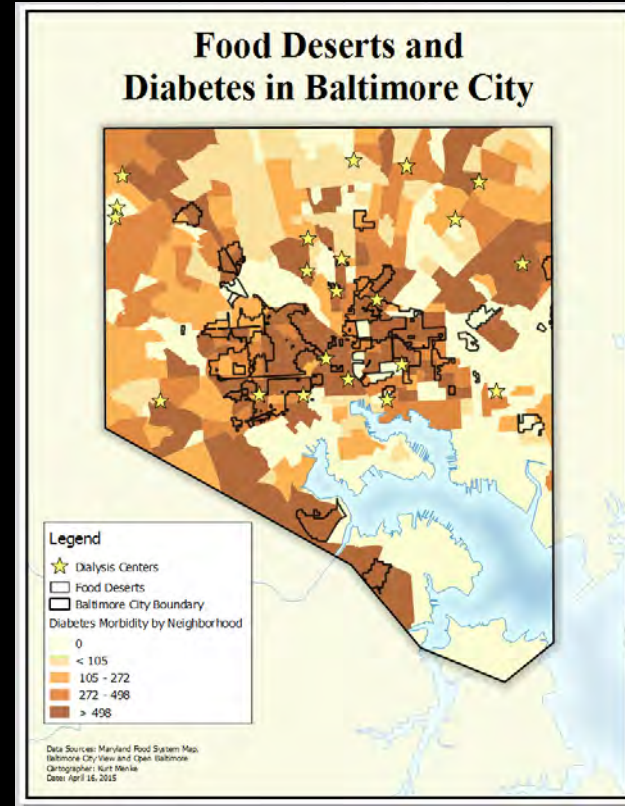
- Combining field data with other datasets
 - Census etc...
- Conducting spatial analyses
- Making publication quality maps



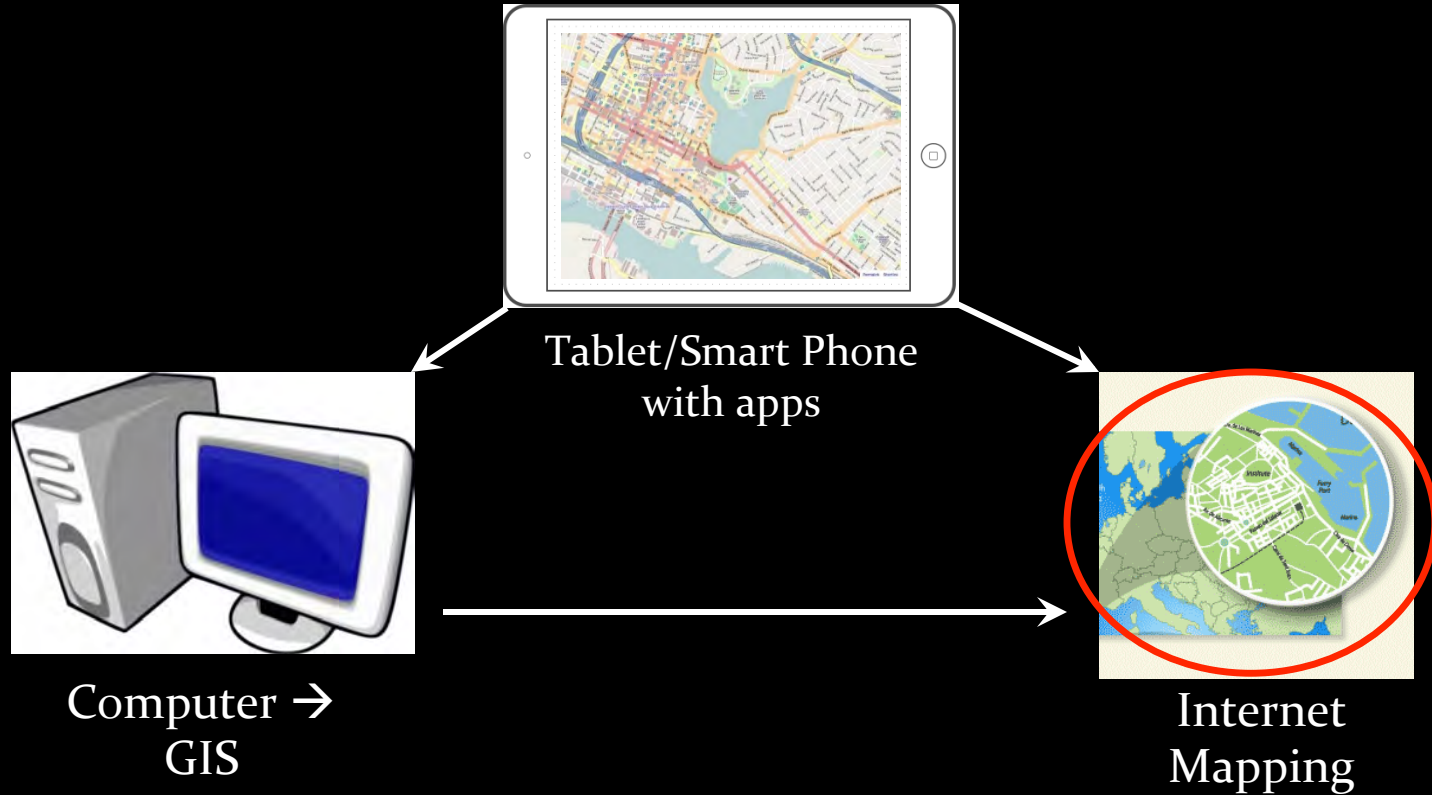
QGIS - Desktop GIS



- The best free and open source desktop GIS
- Runs on Mac/Windows/Linux
- Intuitive
- Reads/writes all common GIS formats
- Powerful analysis tools
- Great cartographic tools



The Community Health Mapping Workflow



Web

- When you want to show maps online
- Data sharing
- We looked for the most intuitive solution
- Involves no programming!

CartoDB

Cloud based mapping
platform

- 1) Create a free account
<http://carto.com/>
- 2) Upload data
- 3) Create visualization
- 4) Share



Carto

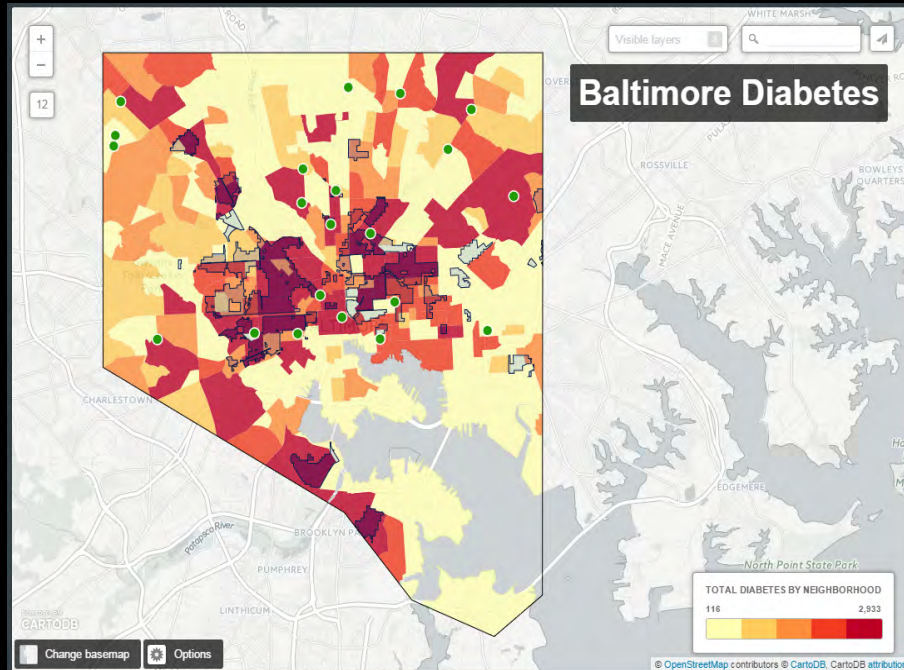
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Carto

- Create custom visualizations
- Share your maps via links or embed into web page



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Case Studies



Seattle, WA

- Noise pollution
- Bicycle Safety
- Asian American Health



Honolulu, HI

- Obesity
- Medicinal Plants



Charleston, SC

- Smoking Cessation
- Migrant Health Resources
- Community Health

University of Hawai'i

John A. Burns School of Medicine

Department of Native Hawaiian Health

Interest

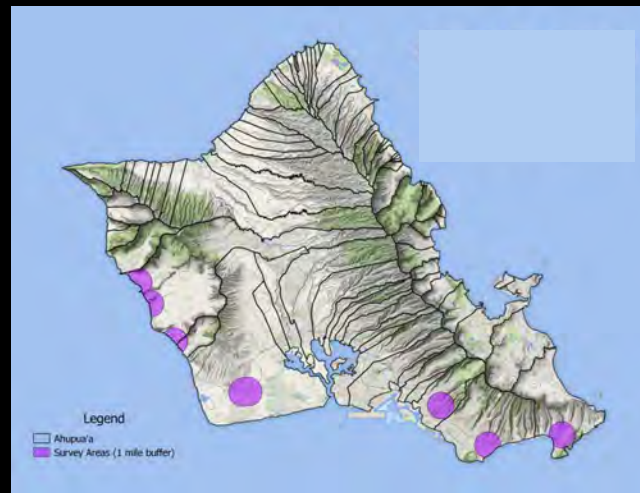
- Obesity in 8 Native Hawaiian communities

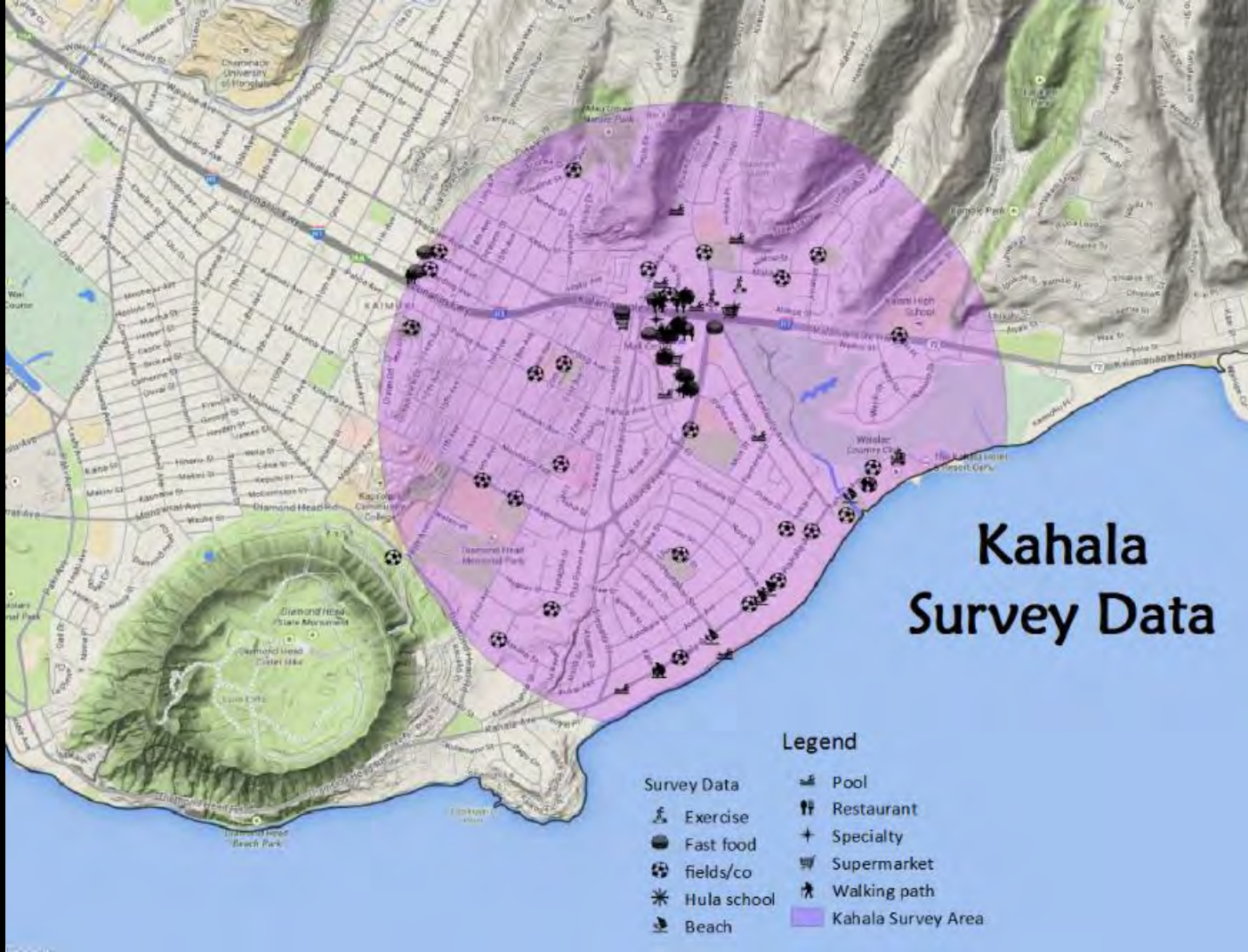
Training

- 1-day in person

Data Collection and Mapping

- Used GIS to create survey areas
- Mapped factors that could impact obesity





Noise Pollution in Urban Native American Seattle Neighborhoods

Community

- The Urban Indian Health Institute
- Interest: Noise pollution and health

Training

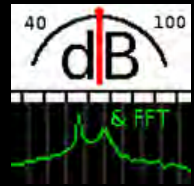
- 1-day in-person training, train-the-trainer

Data collection and mapping

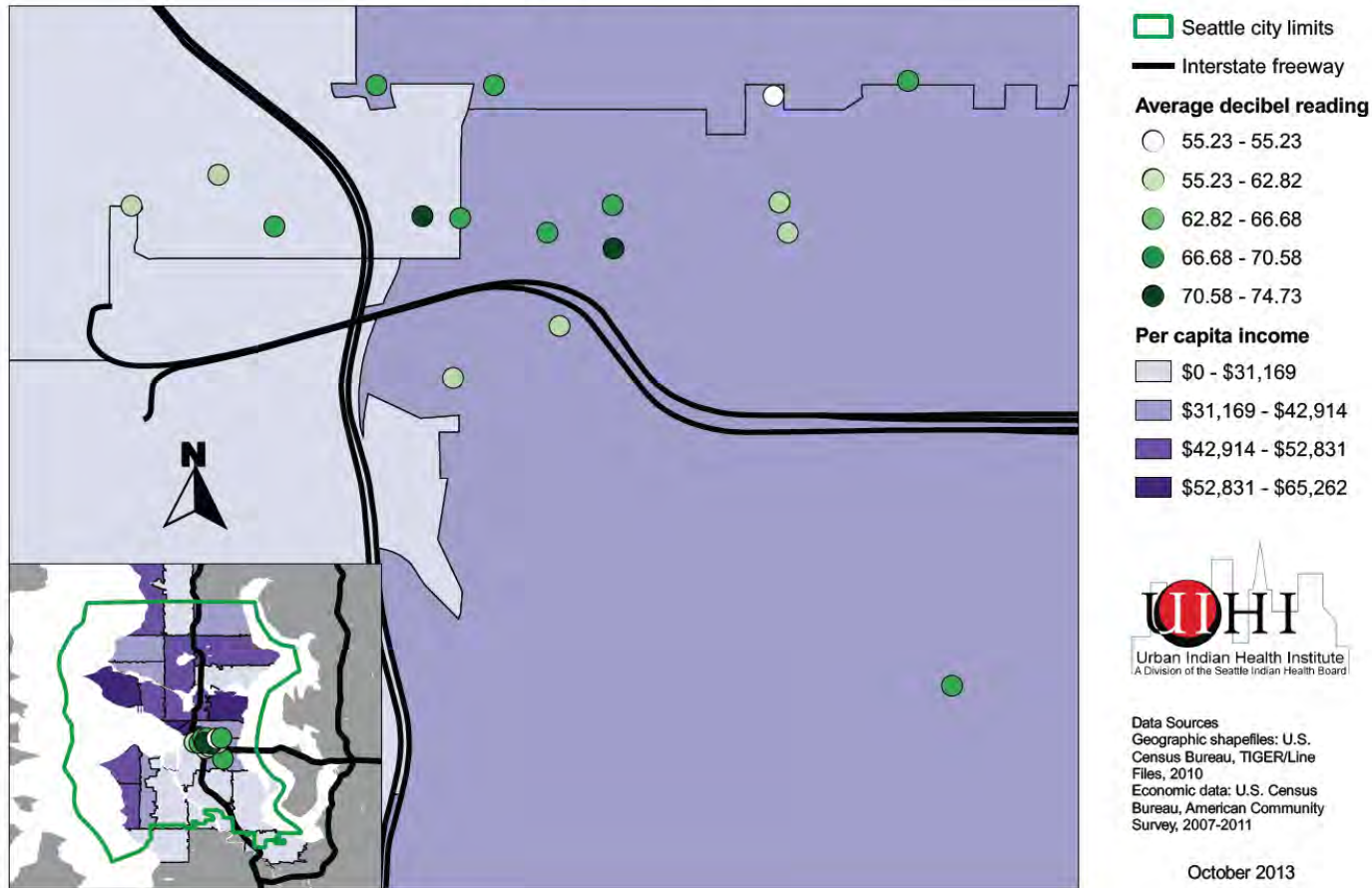
- Surveyed Native American neighborhoods
- Measured and mapped noise pollution

There's an app for that!

SPLnFFT Noise Meter



Geographic Information Systems Pilot Study: Data Collection Results



October 2013

University of Washington Community Health Mapping Workshops



Community Health Mapping Blog

<http://communityhealthmaps.nlm.nih.gov/>

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[PRIVACY & COMMENTS](#)

[ABOUT](#)

[RESOURCES](#)

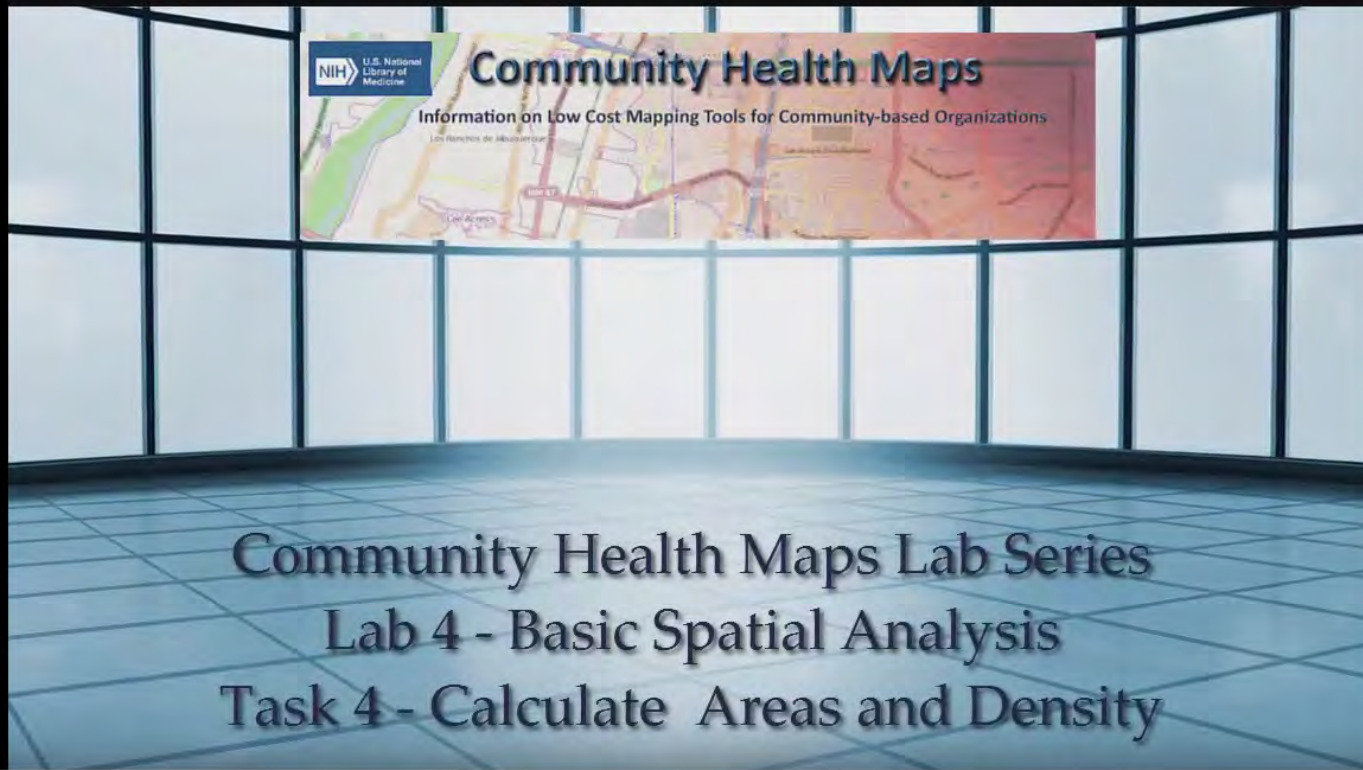


- Keep community mappers abreast of the most recent advances
- Case Studies

CHM Mapping Lab Exercises

1. **Field Data Collection (iOS & Android)**
2. **Bringing Field Data into QGIS**
3. **Combining Field Data with other Organizational Data**
4. **Basic Spatial Analysis**
5. **Cartography with QGIS**
6. **Data Visualization with Carto**

CHM Mapping Videos



<https://www.youtube.com/watch?v=ABAhmzUvjO8&list=PLX3BoyV->

Questions???

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Bird's Eye View

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