



MapStudy

an open source survey tool for studying interactive web maps

Robert E. Roth | @RobertERoth

Associate Professor, UW–Madison Department of Geography
Faculty Director, University of Wisconsin Cartography Laboratory

Carl Sack | @northlandiguana

GIS Faculty, Fond du Lac Tribal & Community College
Coordinator, FDLTCC Geospatial Technologies Program

Meghan Kelly | @meghankellymaps

PhD Candidate, UW–Madison Department of Geography

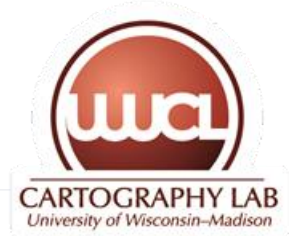
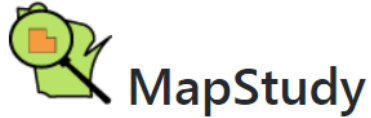
Nick Lally | @nicklally

Assistant Professor, University of Kentucky Department of Geography

Kristen Vincent | @KristenLyn92

GIS Technician, Stantec Consulting Services





What is MapStudy?

MapStudy is an integrated, modularized framework for the creation of survey applications designed to test cartographic design and interaction hypotheses in a modern web map environment. It leverages Postgresql and PHP on the server side and Javascript, jQuery, Leaflet, and D3 on the client. MapStudy is being developed specifically for use in the University of Wisconsin-Madison Cartography program through the support of the UW-Madison Cartography Lab and the Wisconsin Alumni Research Foundation.

What is the status of MapStudy?

The MapStudy framework is currently in beta release, version 0.1. Note that not all functionality is complete. At this time, Leaflet is the only active map library.

Can I have a preview please?

To see a demo app created with the MapStudy framework, [click here](#).

To access the setup application (which has a live preview feature), [click here](#)

Research Participant Information and Consent Form *(scroll down to review and agree to participate)*

Title of this Study: Interactive Maps and Decision Making: A Case Study in the North American Hazardous Waste Trade

Principal Investigator:

Robert E. Roth, PhD
375 Science Hall
N. Park Street
Madison, WI 53706
Email: re Roth@wisc.edu

Student Researcher:

Kristen Vincent
Email: kvincent2@wisc.edu

DESCRIPTION OF RESEARCH:

You are invited to participate in a study researching the design and use of interactive, web-based maps. Specifically, this project investigates the application of these maps for spatial decision-making, and uses a case study about the North American hazardous waste trade.

WHAT WILL MY PARTICIPATION INVOLVE?

If you choose to participate, you will be asked to complete an online survey using interactive maps. The survey should take approximately 30 minutes.

ARE THERE ANY RISKS TO ME?

Risks of participation are minimal. You will be asked to provide background information, but no personally identifying information will be requested.

ARE THERE ANY BENEFITS TO ME?

There are no direct benefits for participating.

WILL I BE COMPENSATED FOR MY TIME?

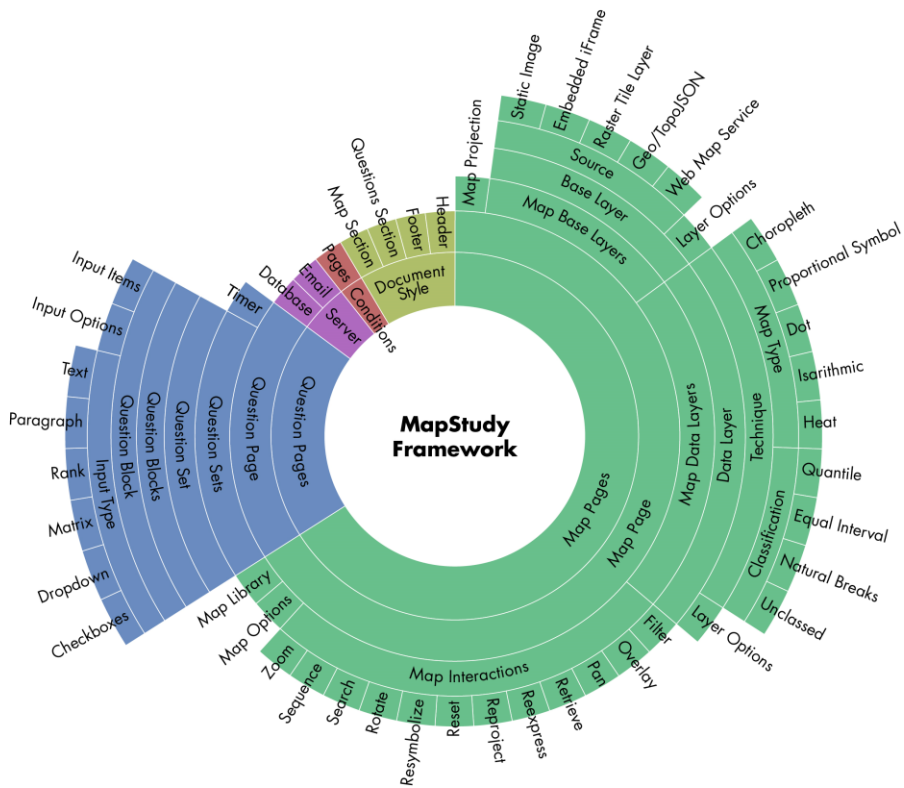
You will receive \$4 upon completion of the map survey.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

If you agree to participate, no individual or confidential information will be used in publications of this work. All responses will be stored on a secure computer.

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?

Integrated & Modular Design



Map

###Filename: map.json

This config file holds the configuration options necessary to create the map. MapStudy will eventually support creating web maps with interaction logging in [Leaflet](#), [Mapbox-GL](#), and [D3](#), and maps with no interaction logging as any of the first three plus a static image, REST service, or embedded iframe with any other web mapping service (e.g. [CartoDB](#) and [ArcGIS Online Viewer](#)).

In the descriptions below, `map` refers to each object in the map.json `pages` array. The map.json file should be structured thus:

```
{
  "pages": [
    {
      //map options for page 1
    },
    {
      //map options for page 2
    },
    ...
  ]
}
```

`map.pages[page].library`

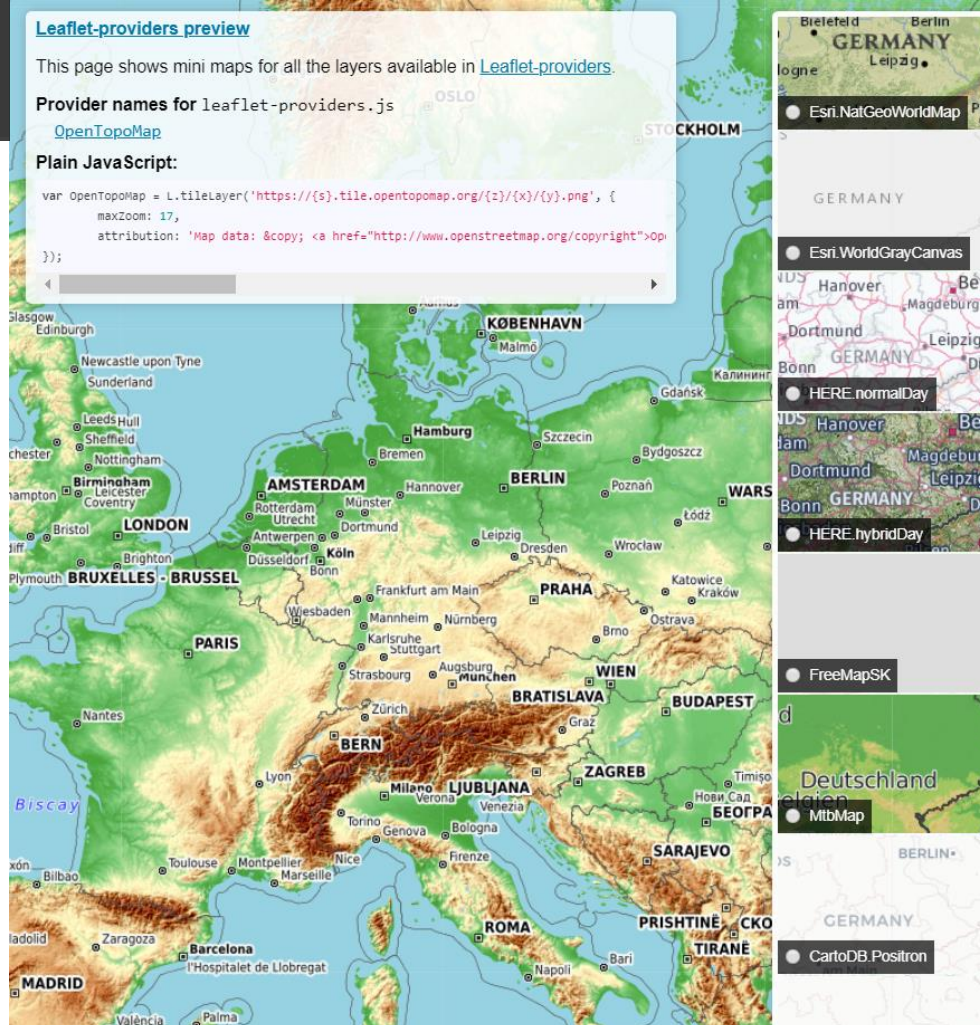
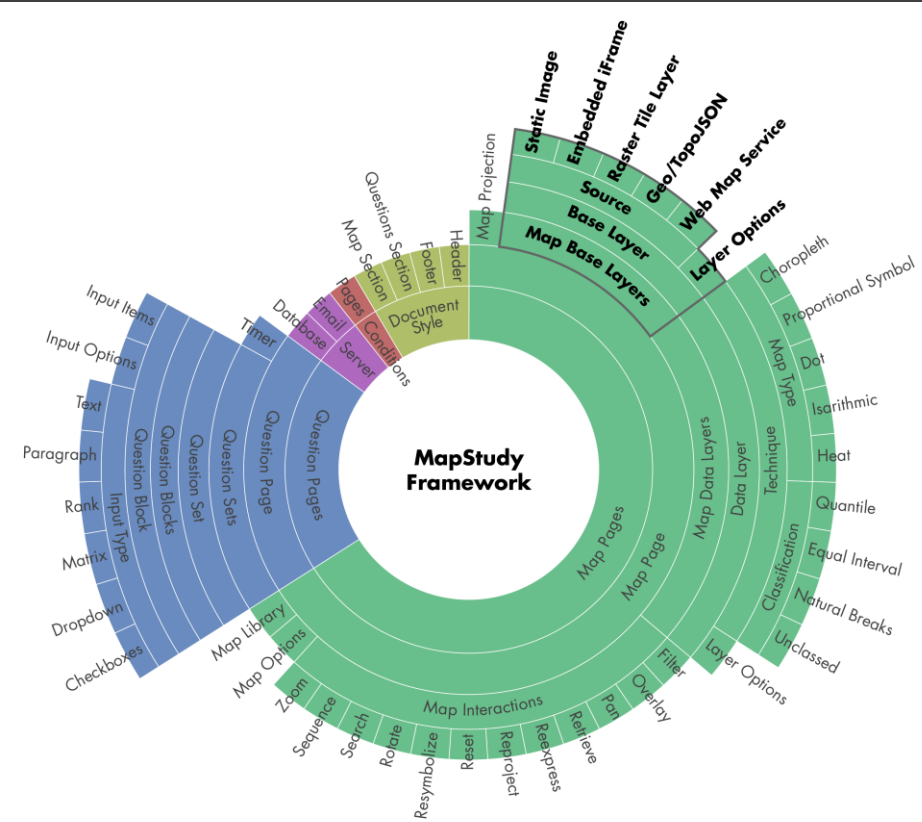
```
"library": "*"Leaflet"* *Mapbox-GL"* *D3"* *image"* *REST"* *iframe**
```

The web mapping library or service to use to create the map. Currently only supports [Leaflet](#).

`map.pages[page].interactions`

```
"interactions": {
  *zoom*
  *pan*
  *retrieve*
  *overlay*
  *search*
  *filter*
  *sequence*
  *reexpress*
  *rotate*
  *resymbolize*
  *reproject*,
  *reset*
}
```

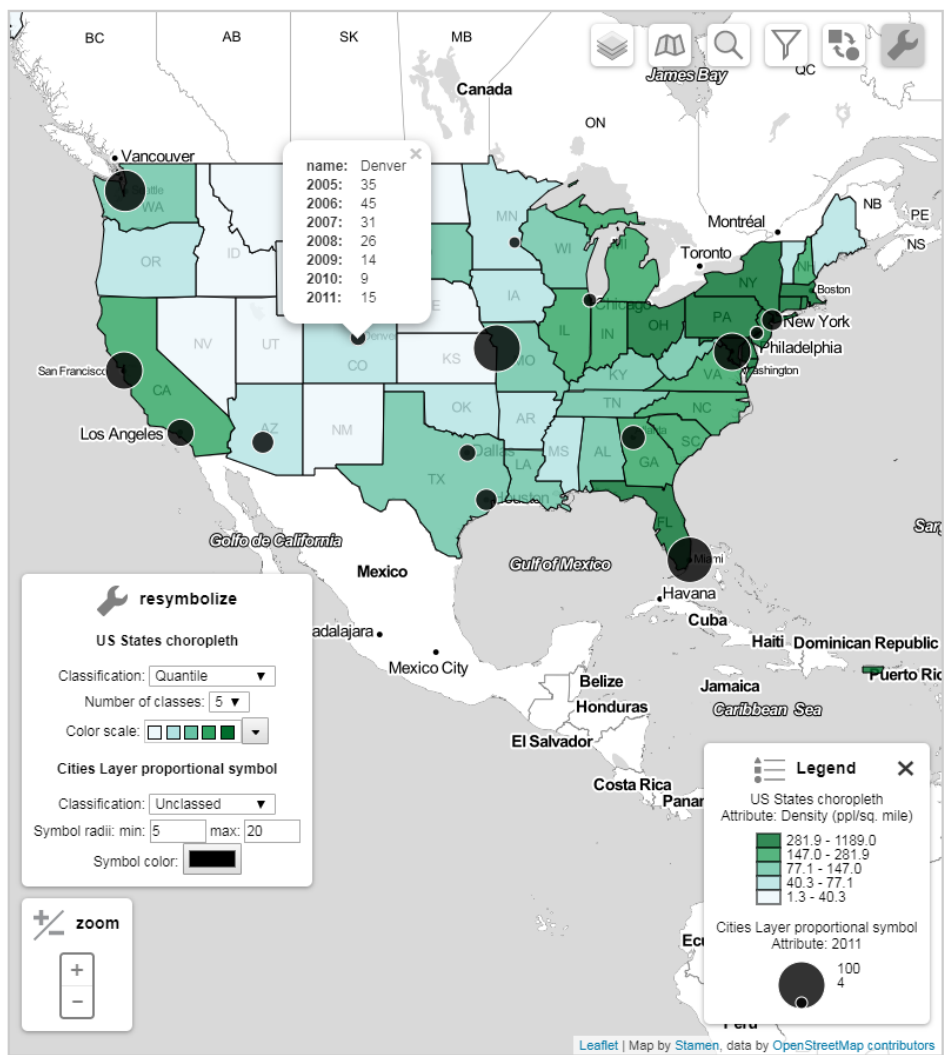
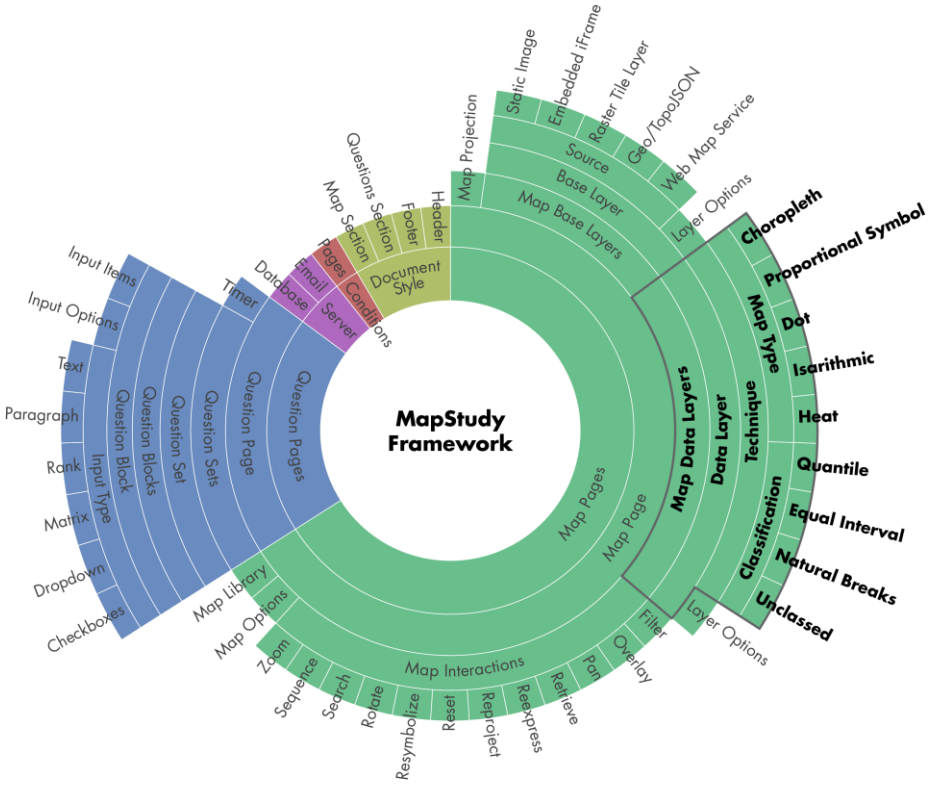
Base Layers



Source: <http://github.com/uwcart/mapstudy/>

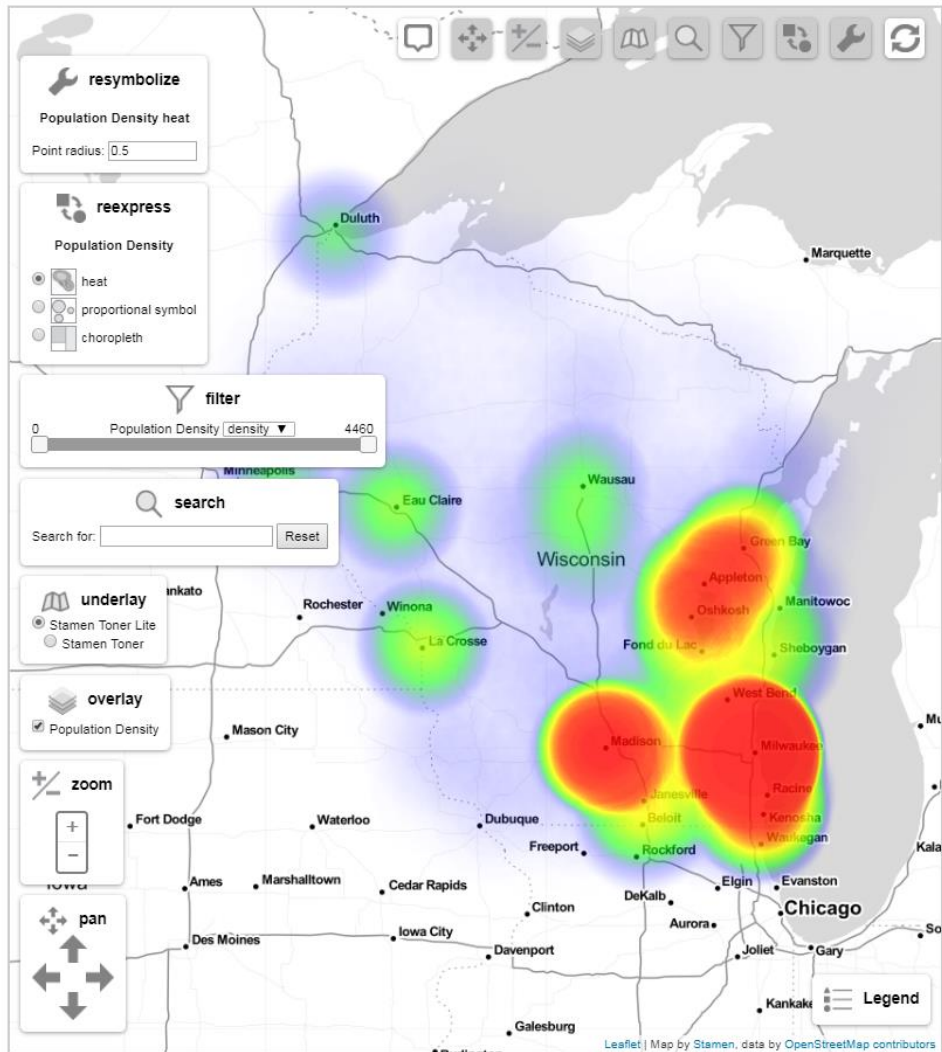
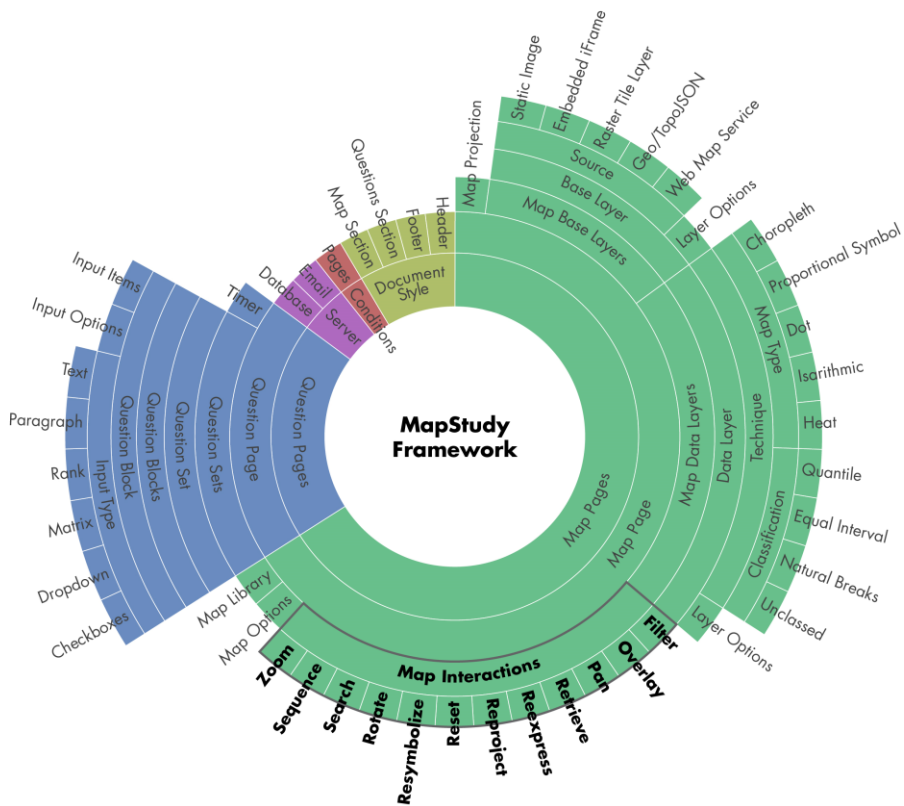
Source: <http://leaflet-extras.github.io/leaflet-providers/preview/>

Data Layers



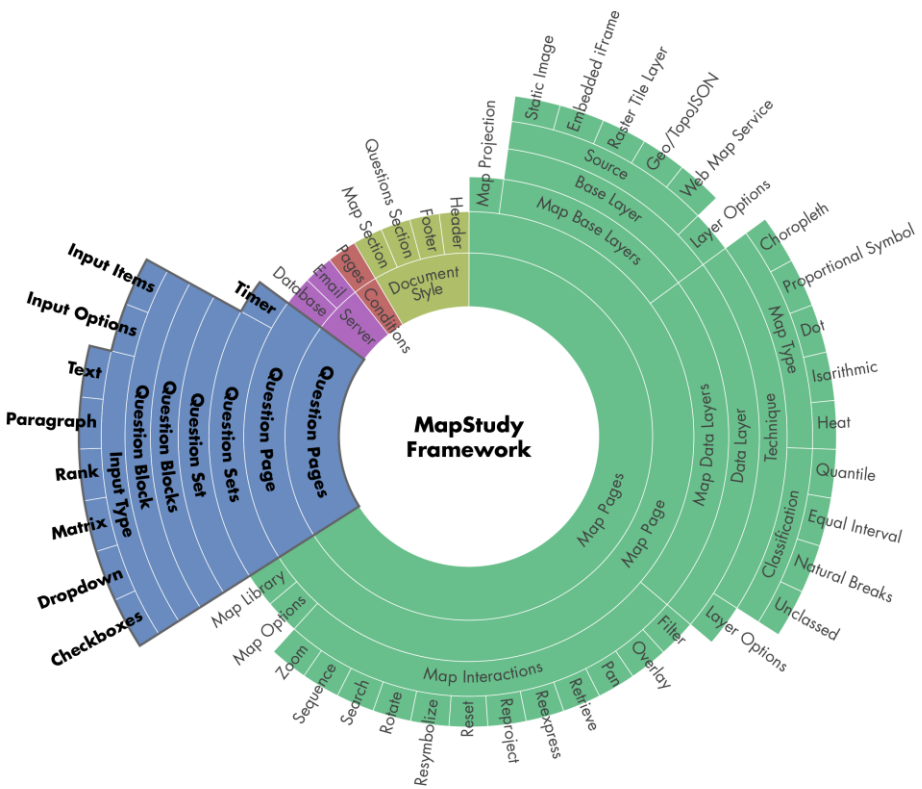
Source: <http://github.com/uwcart/mapstudy/>

Map Interactions



Source: <http://github.com/uwcart/mapstudy/>

Question Input Types



This is the first set of Page 2.

All of the questions you can see and the buttons belong to the same set. These blocks are designed give you an idea of what kinds of inputs you can create.

* What is thy name?

Gimme a name!

Quest

What is thy quest?

Color

What is thy favorite color?

- Green.
- No, no--blue!

Airspeed Velocity

What is the airspeed velocity of an unladen swallow?

10 kph 20 kph 30 kph I don't know!

- African
- European

Swallow Type

* African or European?

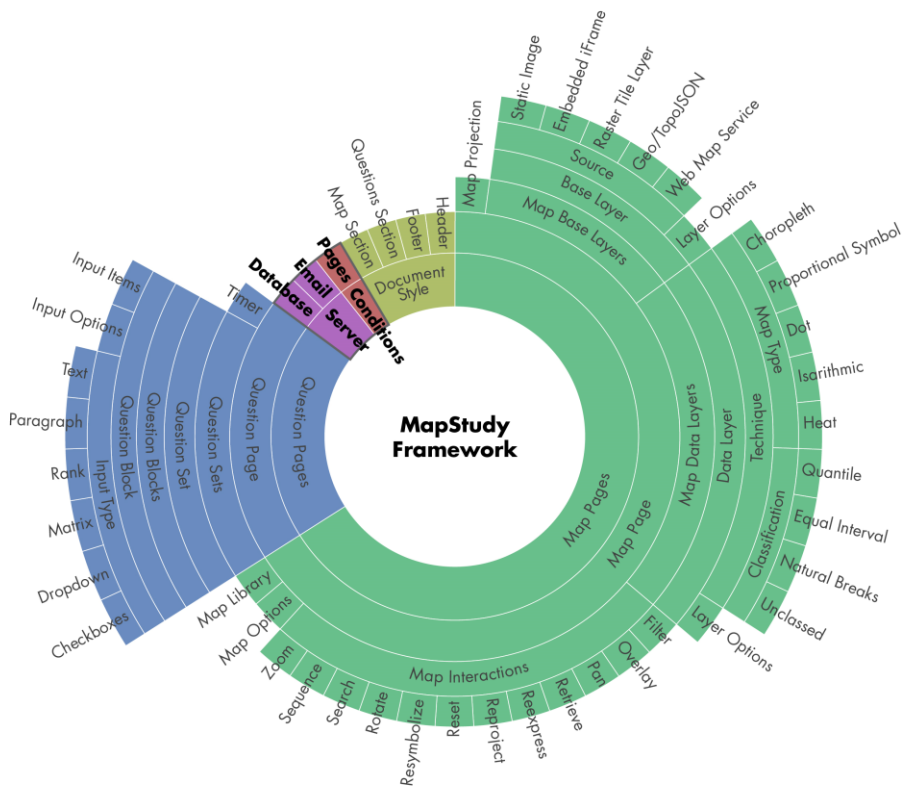
Select an answer to move to the next set...

- African
- European
- Other
- I don't know that!

Back

Save

Experimental Control



pid	retrieve	pan	zoom	overlay	underlay	search	filter	reexpress	resymbolize	int_string
195564355	6		3	1	2		2	1		retrieve, retrieve, retrieve
704483381	2	5	3	1				1	6	retrieve, reexpress, retrieve
611151524	6	5	5	1		1	1	1	1	zoom, pan, retrieve, retrieve
120802189	3		2		1	1		2	2	retrieve, zoom, zoom, unc
768125978	3	2	2	1	2			2		pan, pan, retrieve, retrieve
597432627	2	2	2	3			3			zoom, retrieve, overlay, ov
46627724	2	2	2	1	2	1				retrieve, overlay, underlay
560852163	1	1	2				1	1	2	retrieve, filter, reexpress,
221000279	1	2			2		3			pan, retrieve, underlay, pa
724363606	2	3	4	1	2	1	5		3	zoom, zoom, pan, overlay
615318055	2	1	2			3				search, search, search, zo
727294398	9	2	4	1		1	2		2	retrieve, zoom, zoom, retr
573254643	6	2	2							zoom, zoom, pan, retrieve
316340084	1			1	1		2	1	3	retrieve, overlay, reexpres
396876386	7	1	2	1						retrieve, retrieve, retrieve
75888437	3	1	2	2	2					zoom, zoom, pan, retrieve
20486948	3	2	5	1		1		1		pan, zoom, zoom, retrieve
478846892	1	5	3					2		zoom, zoom, pan, pan, pa
87658939	3	1	3					2	4	retrieve, zoom, zoom, ree
778383588	6		2	1	1					retrieve, zoom, zoom, retr

Study Design	MapStudy #1: Interface Complexity
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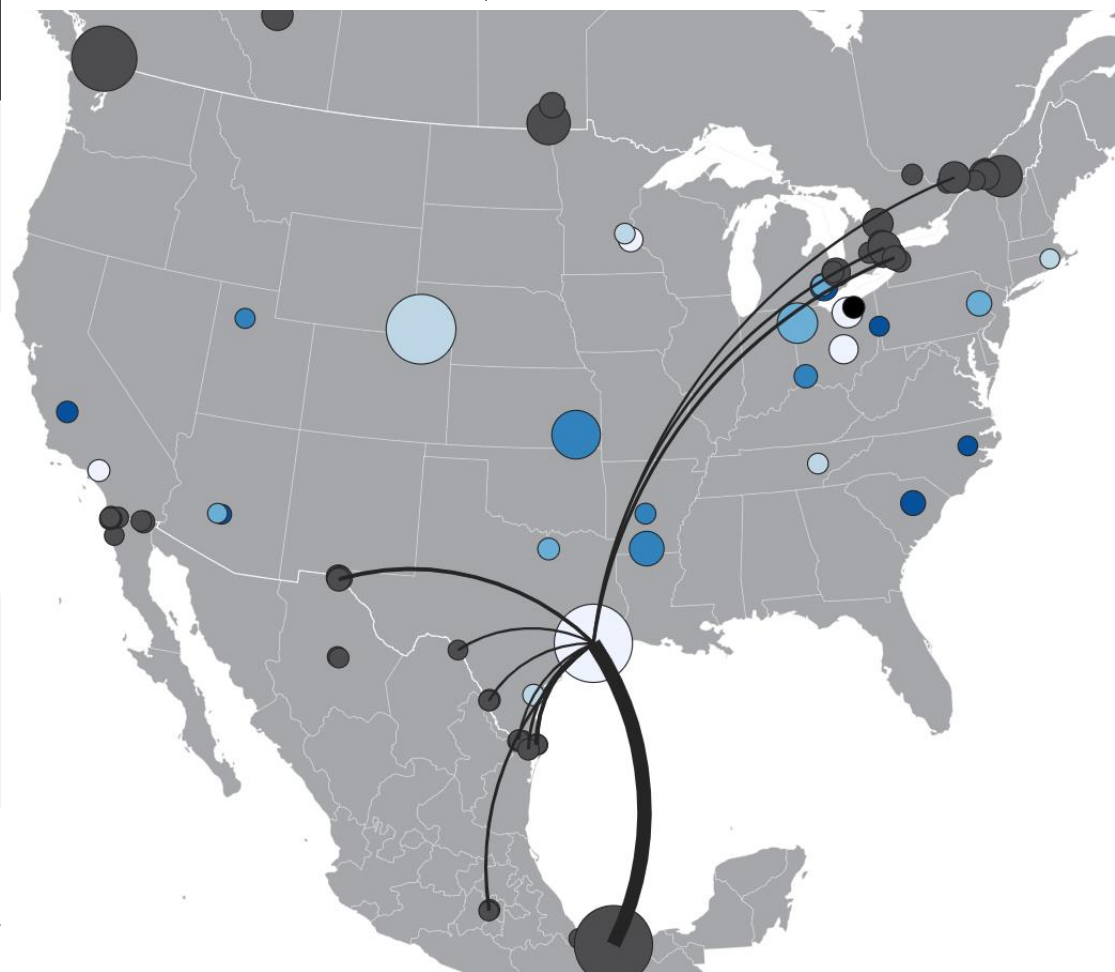
Participants	<ul style="list-style-type: none">• 110 non-experts (MTurk)• 12 experts (EPA managers)
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Materials/ IDVs	2x2 factorial study: <ul style="list-style-type: none">• interface complexity (<i>low, high</i>)• decision complexity (<i>low, high</i>)
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Procedure/ Tasks	2 decision scenarios <ul style="list-style-type: none">• multi-criteria ranking tasks• Ohio & Texas
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Measures/ DVs	<ul style="list-style-type: none">• decision correctness• perceived difficulty & confidence• operator frequency
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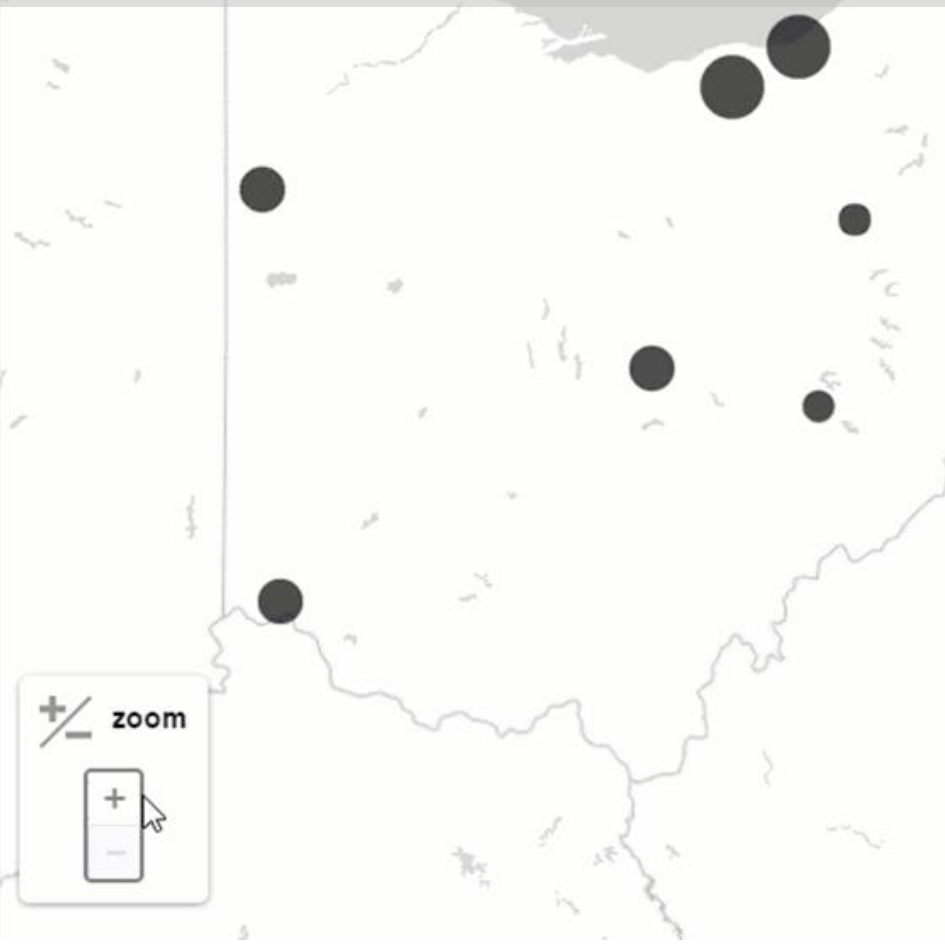
International Hazardous Waste Imports to Clean Harbors, Houston 2007-2012



Source: <http://geography.wisc.edu/hazardouswaste/map/v1>

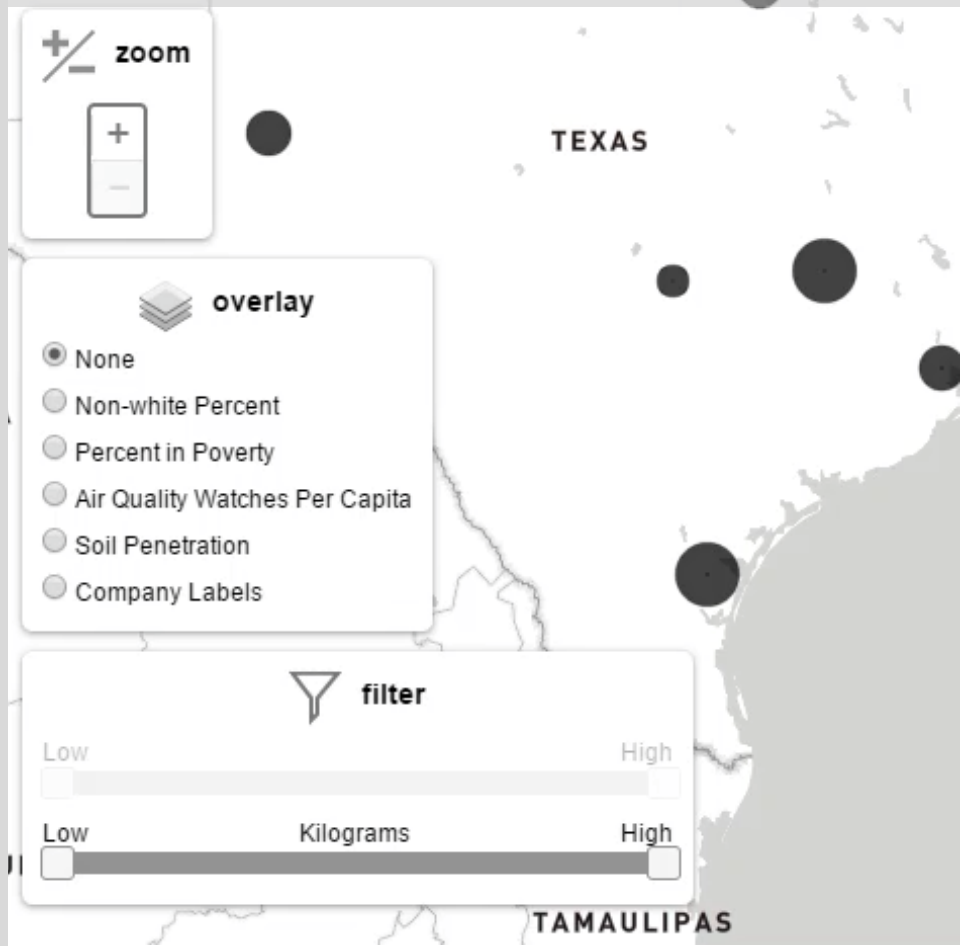
Simple UI: Slippy Map

Pan, Zoom, Retrieve

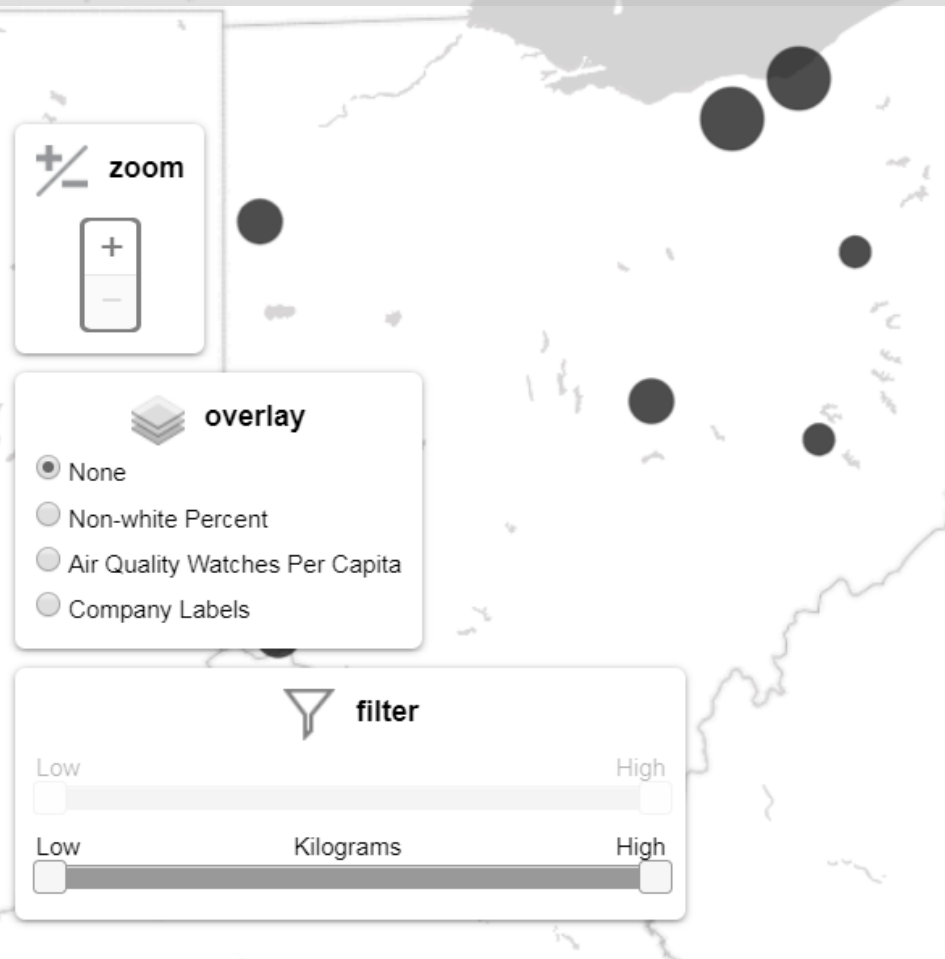


Complex UI: Shneiderman's Mantra

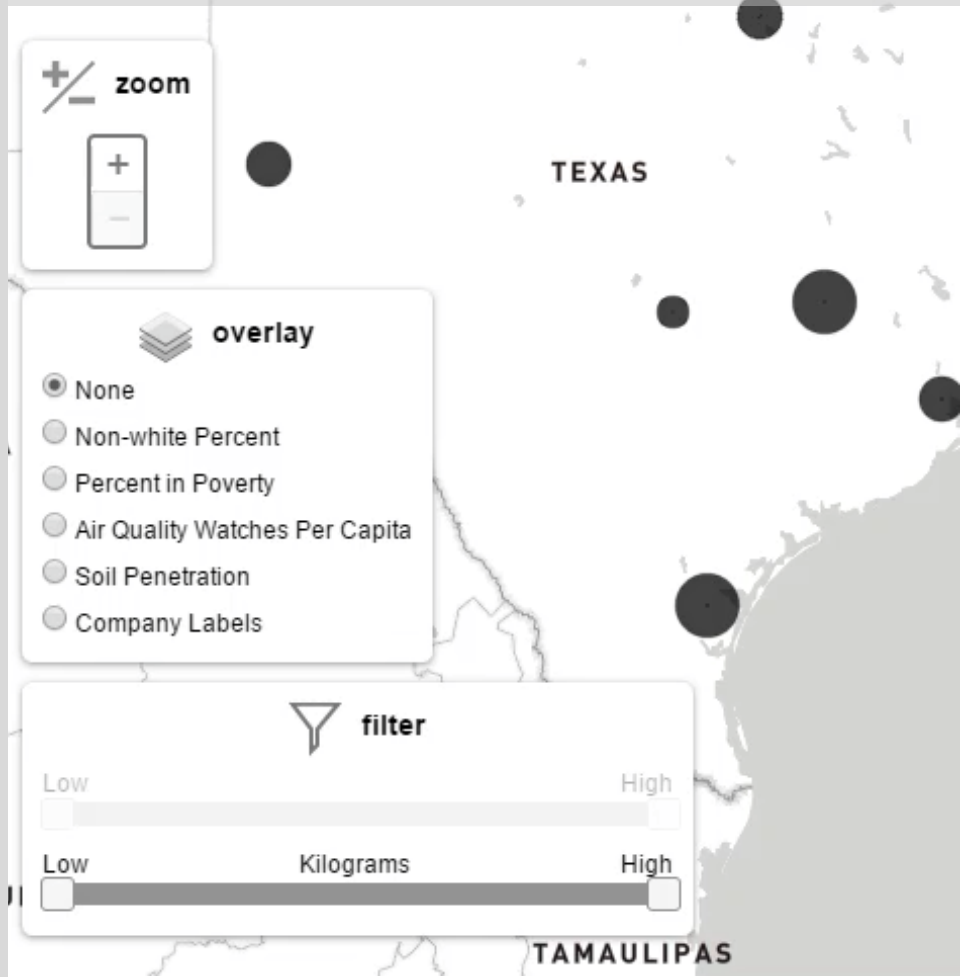
Pan, Zoom, Retrieve, Overlay, Filter

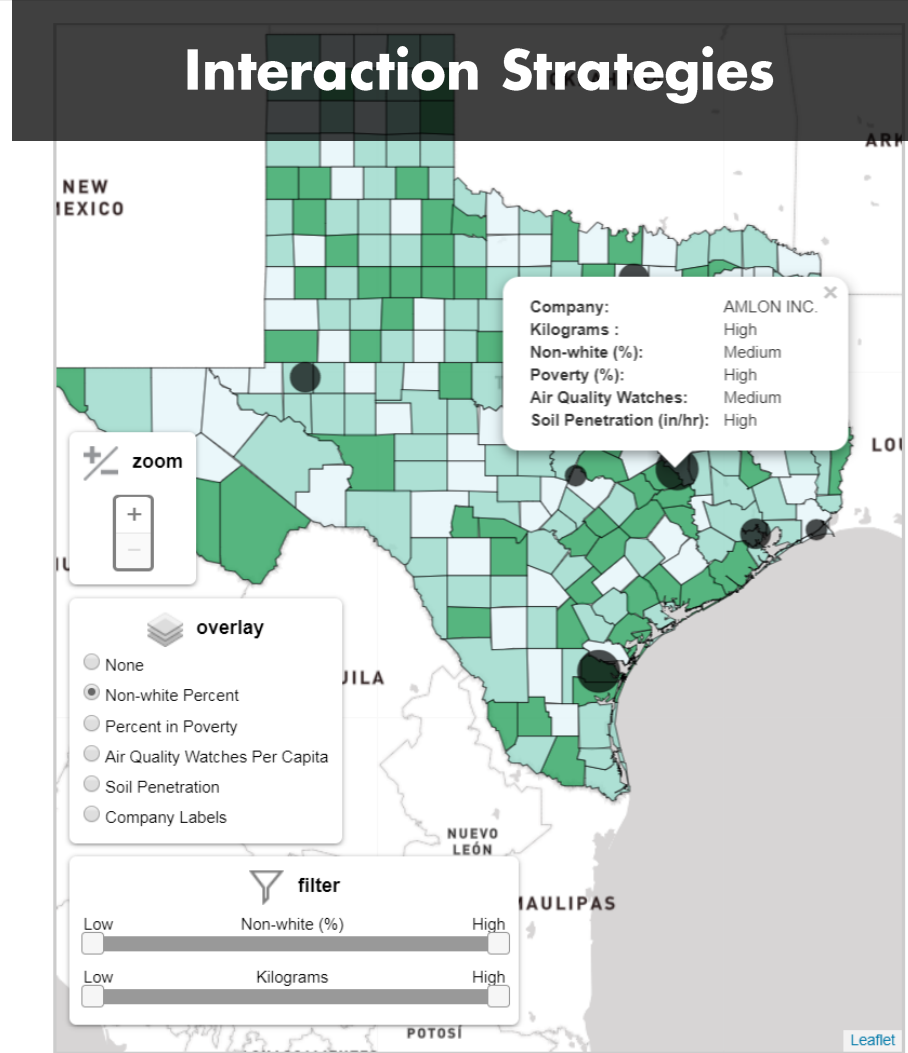
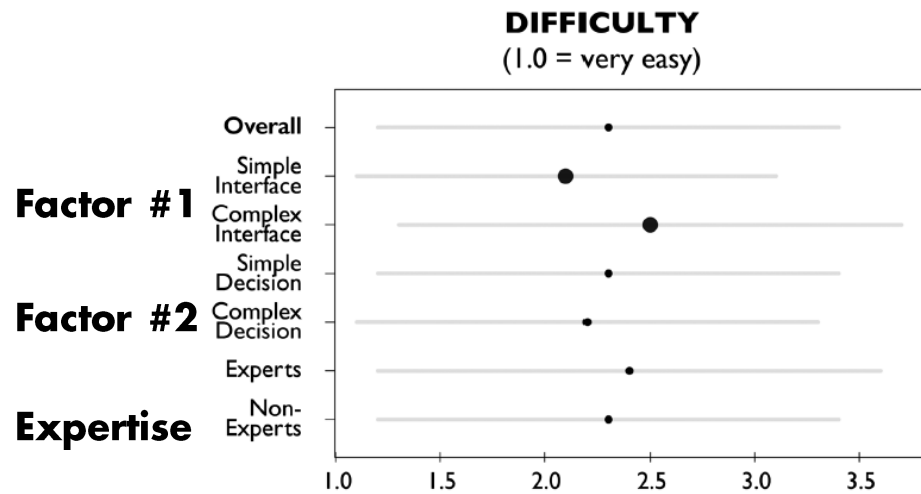
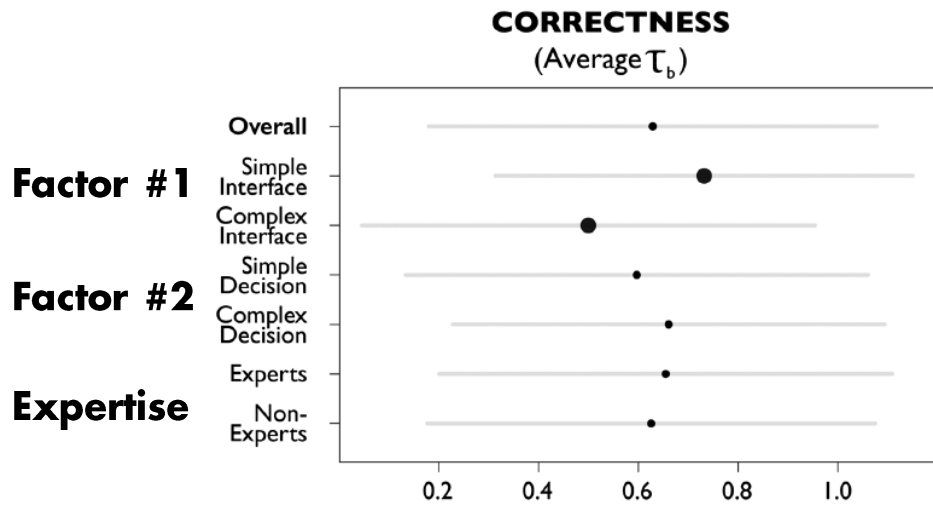


Simple Decision: Three Criteria



Complex Decision: Five Criteria





Environment and Planning B: Urban Analytics and City Science

1.527 Impact Factor

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Improving spatial decision making using interactive maps: An empirical study on interface complexity and decision complexity in the North American hazardous waste trade

[Kristen Vincent](#), [Robert E Roth](#) , [Sarah A Moore](#) [more...](#)

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Supplemental material files:

- [Supplementary Material 1](#)
- [Supplementary Material 2](#)
- [Supplementary Material 3](#)
- [Supplementary Material 4](#)

Complexities Source Code -Supplemental material for Improving spatial decision making using interactive maps: An empirical study on interface complexity and decision complexity in the North American hazardous waste trade

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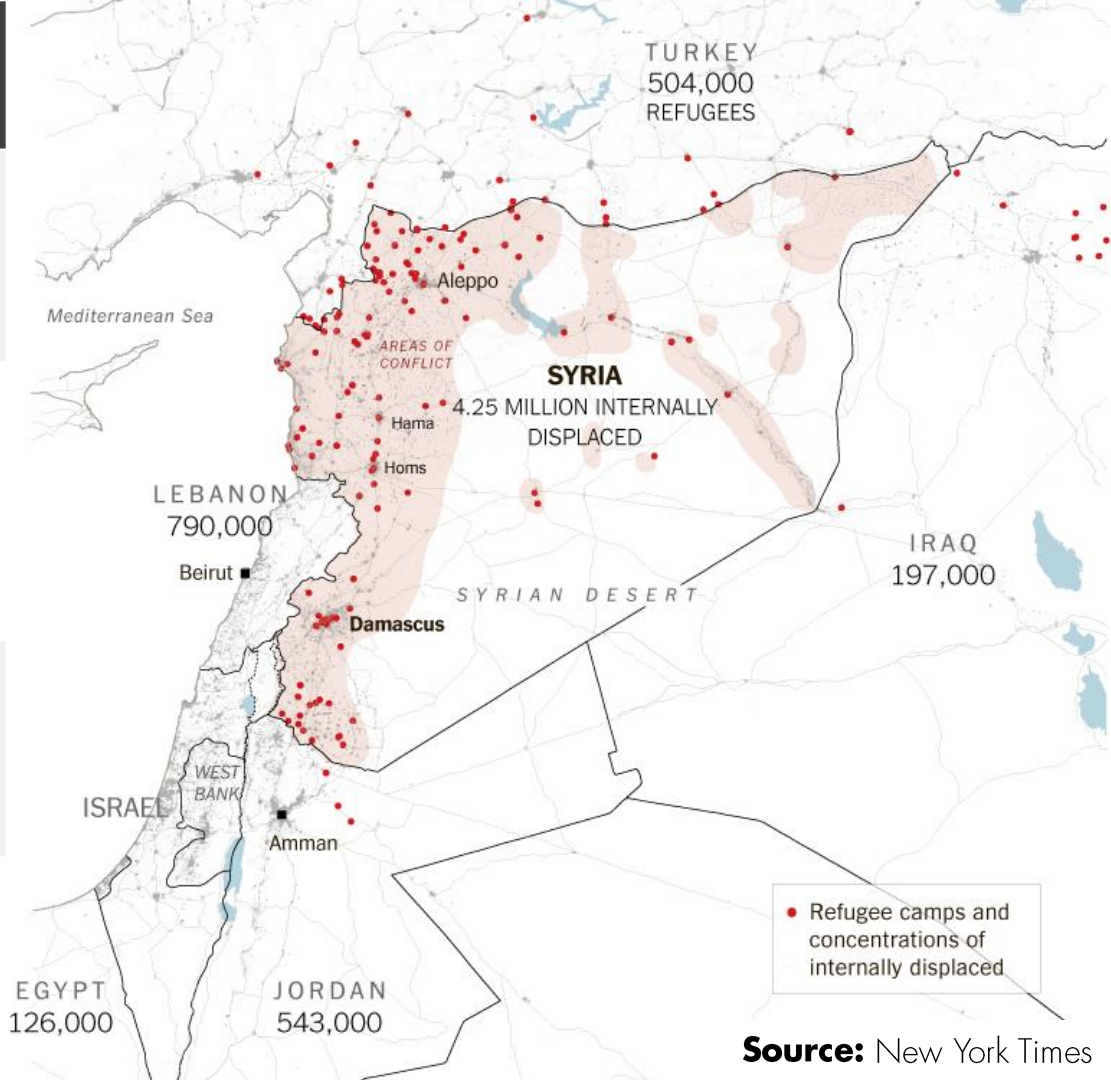
Study Design	MapStudy #2: Humanizing Web Maps
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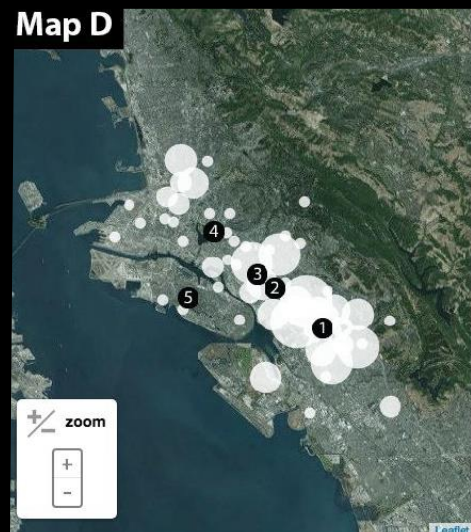
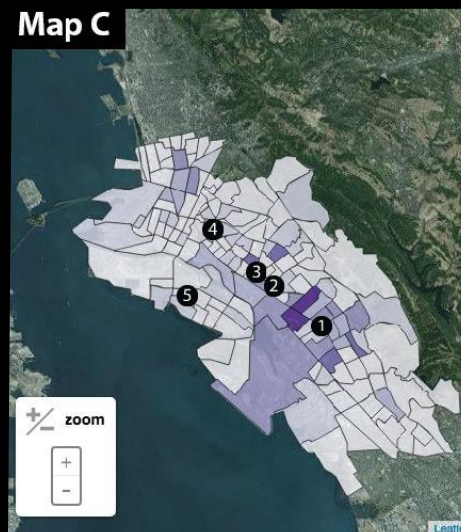
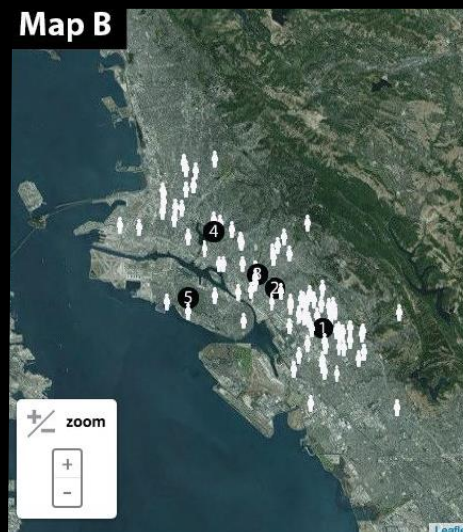
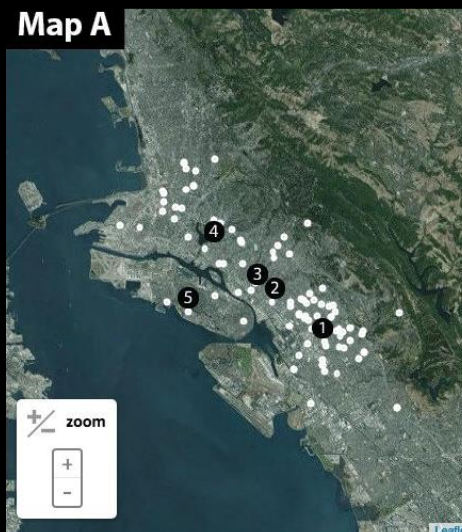
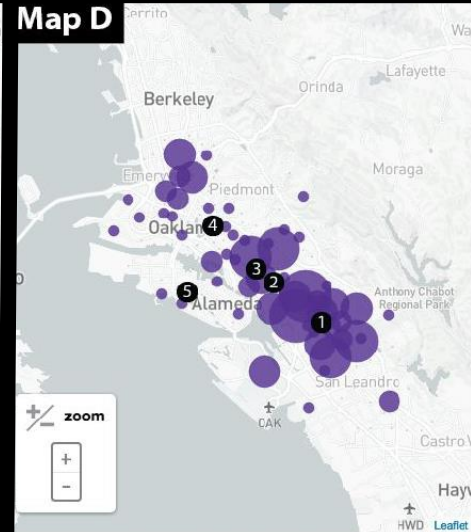
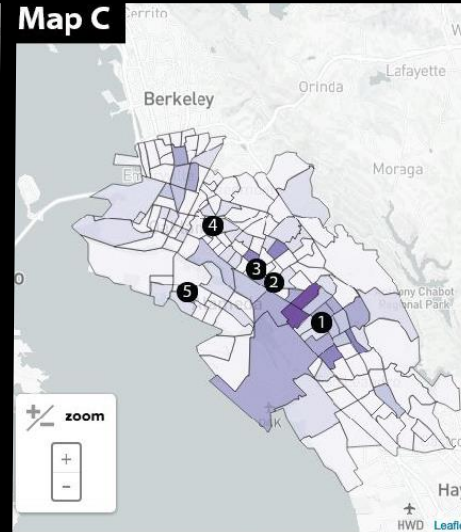
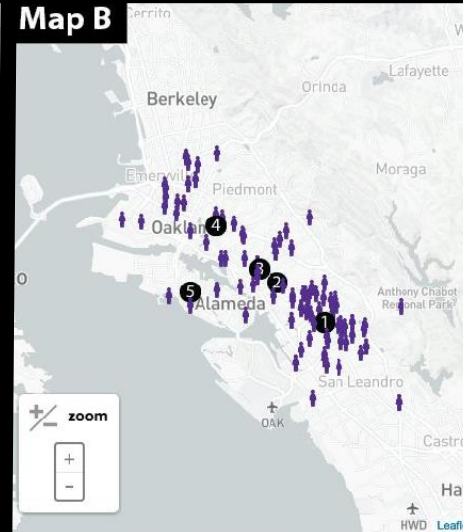
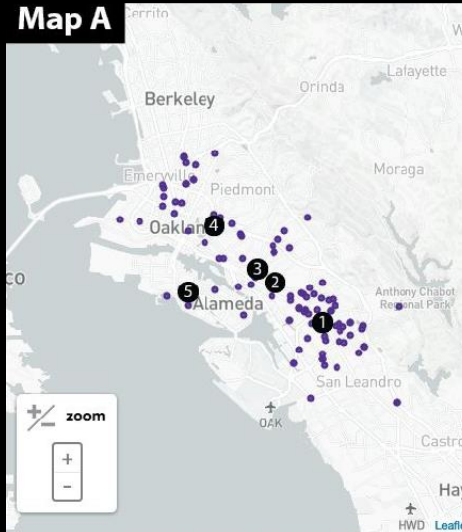
Participants	• 160 non-experts (MTurk)
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Materials/ IDVs	4x2x2 factorial study: <ul style="list-style-type: none">• map type (<i>dot, icon, choropleth, prop symbol</i>)• basemap (<i>simple, imagery</i>)• popup details (<i>quant, qual</i>)
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Procedure/ Tasks	2 decision scenarios: <ul style="list-style-type: none">• single-criteria ranking tasks• Aleppo & Oakland
---------------------	--

Measures/ DVVs	<ul style="list-style-type: none">• operator frequency• affect ratings• empathetic engagement
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Quantitative/Table



Count: 4
Age (average): 32
Male (%): 75
Minors (%): 0
Gun deaths (%): 25

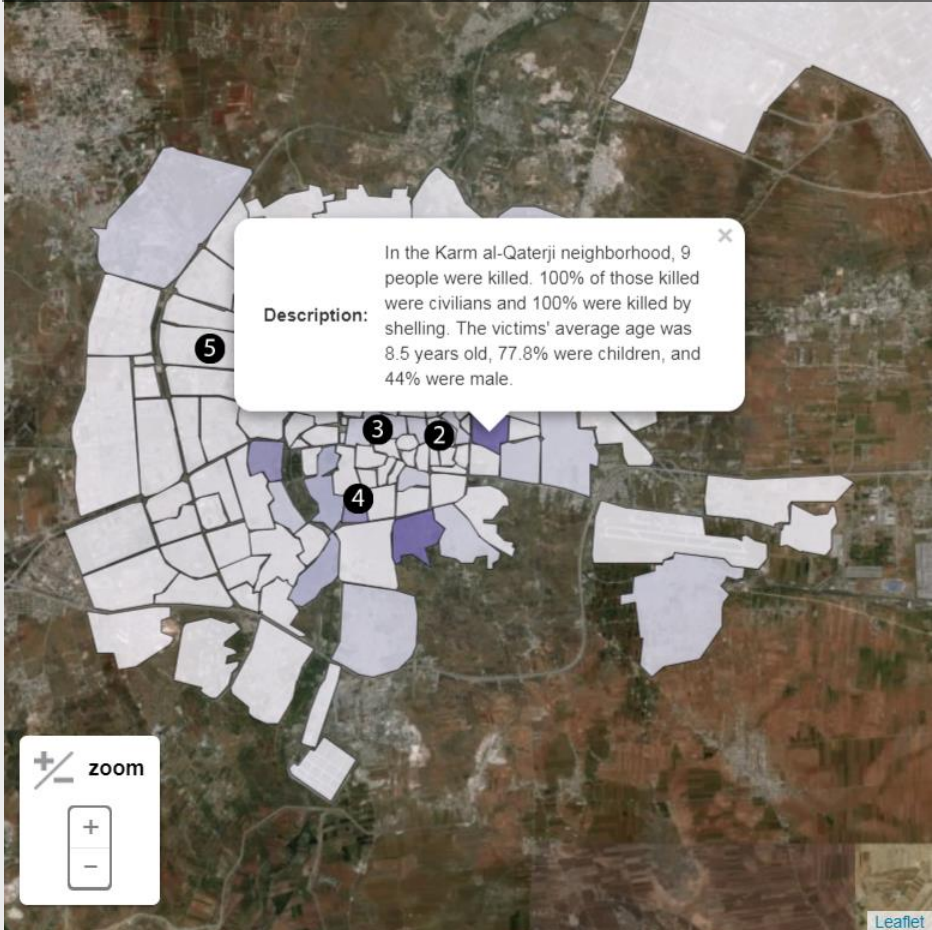
zoom



Leaflet

Qualitative/Narrative

Description:

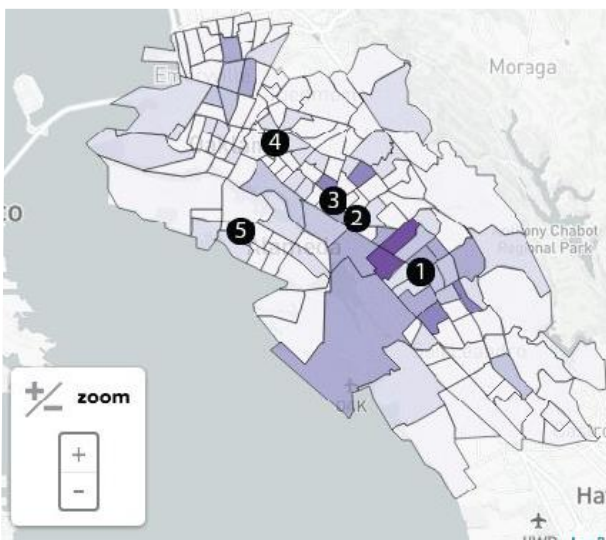
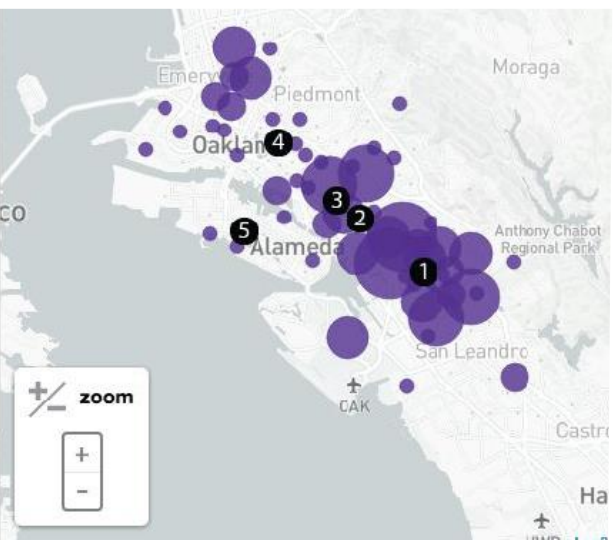
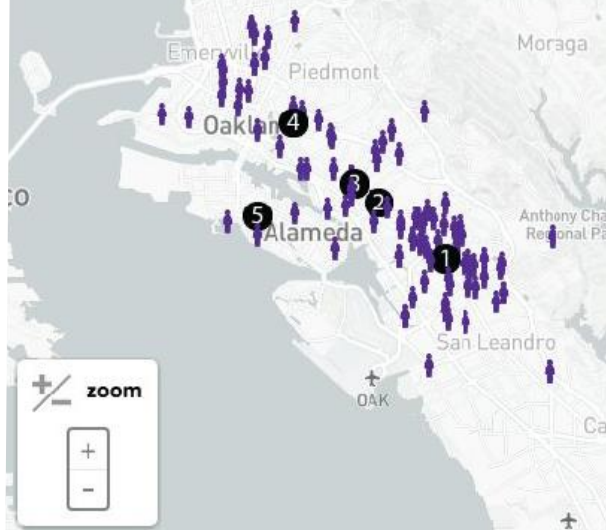
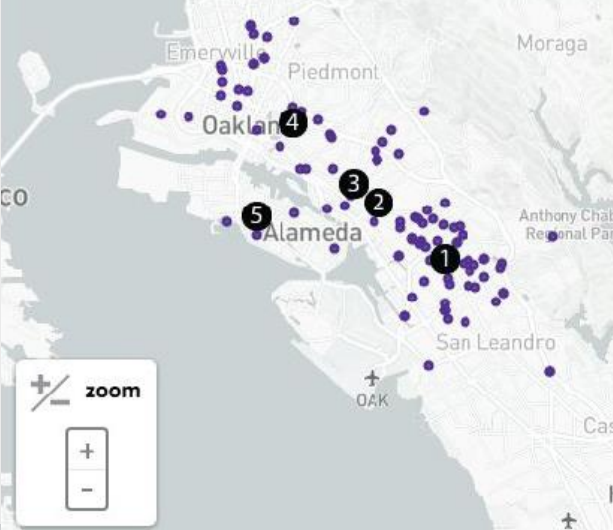


In the Karm al-Qaterji neighborhood, 9 people were killed. 100% of those killed were civilians and 100% were killed by shelling. The victims' average age was 8.5 years old, 77.8% were children, and 44% were male.

zoom



Leaflet



Total Interactions

Factor #1: Map Type

	avg	sd
dot	9.33	9.51
icon	12.57	15.78
choropleth	13.12	14.19
proportional	17.29	21.58
	ANOVA (F)	

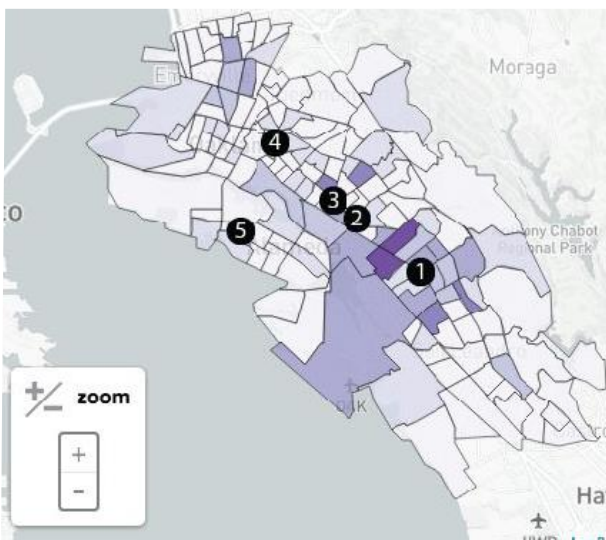
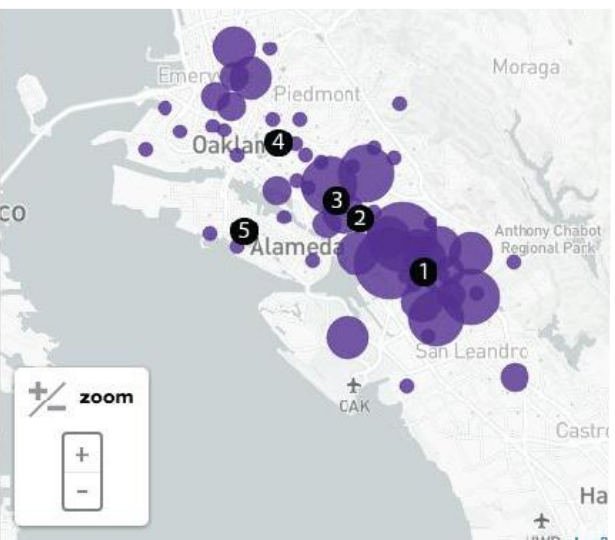
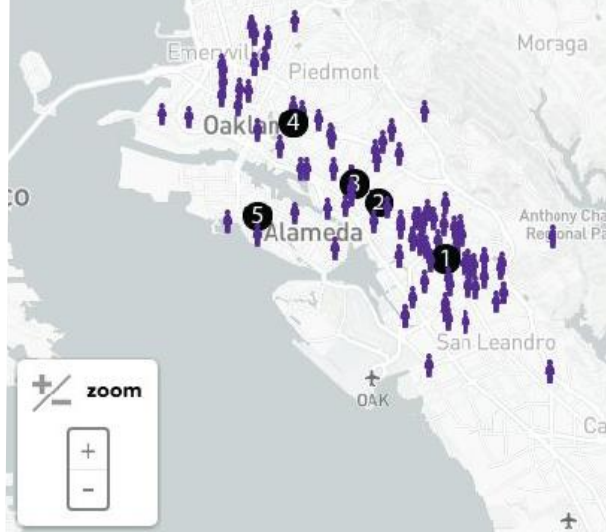
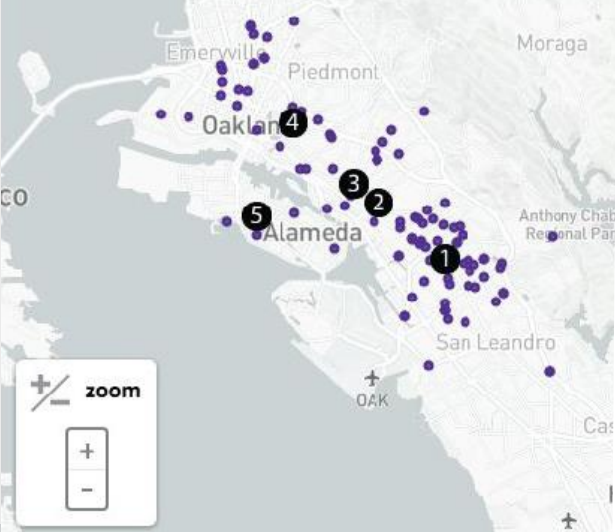
hypothesis test

3.4470

0.0170

Factor #3: Popup Details

	avg	Sd
qual	11.25	12.85
quant	14.85	18.50
	Student T (t)	
hypothesis test	-2.0373	0.0425



Negative PANAS

Factor #1: Map Type

	avg	sd
dot	17.49	9.82
icon	18.79	8.33
choropleth	14.70	6.31
proportional	17.75	8.38
	ANOVA (F,p)	

hypothesis test	3.5770	0.0143
-----------------	---------------	---------------

Factor #3: Popup Details

	avg	sd
qual	17.10	8.43
quant	17.30	8.43
	Student T (t,p)	

hypothesis test	-0.2103	0.8336
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Integrated, modularized framework for testing cartographic hypotheses

164 commits 5 branches 1 release 3 contributors

Branch: master New pull request Find file Clone or download

uwcart Merge pull request #30 from northlandiguana/master	Latest commit 9fcc4fc on Jun 16, 2017
config	fixed point symbol rendering bug a year ago
css	added accordions to legend and hover state to interaction switches 11 months ago
data	implemented resymbolize for dot maps 2 years ago
doc	added accordions to legend and hover state to interaction switches a year ago
img	added accordions to legend and hover state to interaction switches 11 months ago
js	added accordions to legend and hover state to interaction switches 11 months ago
participants	building on setup app 2 years ago
php	struggling with the gitignore 2 years ago
setup	added reset button to setup app 2 years ago
editorconfig	Added HTML5 Boilerplate and favicon 3 years ago
gitattributes	Added HTML5 Boilerplate and favicon 3 years ago
gitignore	gitignore compiled readme.html a year ago
.htaccess	Added HTML5 Boilerplate and favicon 3 years ago
404.html	Added HTML5 Boilerplate and favicon 3 years ago
LICENSE.txt	added new API to doc folder 2 years ago
README.md	added participant text input option for radios and checkboxes a year ago
README.md.bak	added reset button to setup app 2 years ago
apple-touch-icon.png	Added HTML5 Boilerplate and favicon 3 years ago
browserconfig.xml	Added HTML5 Boilerplate and favicon 3 years ago
crossdomain.xml	Added HTML5 Boilerplate and favicon 3 years ago
favicon.ico	Added HTML5 Boilerplate and favicon 3 years ago
humans.txt	Added HTML5 Boilerplate and favicon 3 years ago
index.html	enabled iframe library a year ago
mapstudy.png	Added icon to readme 3 years ago
mapstudy.sublime-project	allow custom layer options for heatmap a year ago
mapstudy.sublime-workspace	updated D3 to v4 and fixed Leaflet zoom control CSS a year ago
robots.txt	Added HTML5 Boilerplate and favicon 3 years ago
tile-wide.png	Added HTML5 Boilerplate and favicon 3 years ago
tile.png	Added HTML5 Boilerplate and favicon 3 years ago
README.md	

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Step 1. Interface

The first step is to customize the interface that survey participants will see. Use this form to upload a custom logo and change the look of the header, footer, map, and questions sections if you want. All options currently shown are the defaults.

Header

Do you want to include a header? yes

Header background color:

Add custom CSS? no

Do you want a custom logo on the right side of the header? no

Do you want to include a title in your header? yes

Title text or HTML:

Footer

Do you want to include a footer? yes

Footer background color:

Add custom CSS? no

Do you want to include text or HTML content in your footer? yes

Footer text or HTML:

Map Section

Do you want to add custom CSS to the map section? no

Questions Section

Do you want to add custom CSS to the questions section? no

Next Step →

Try our Survey Builder!



MapStudy is supported by
NSF CAREER #1555267



& the **UW Cart Lab**

CARTOGRAPHY LAB
University of Wisconsin-Madison



MapStudy

Check it out at: <http://github.com/uwcart/mapstudy/>

Robert E. Roth | @RobertERoth

Associate Professor, UW-Madison Department of Geography
Faculty Director, University of Wisconsin Cartography Laboratory

Carl Sack | @northlandiguana

GIS Faculty, Fond du Lac Tribal & Community College
Coordinator, FDLTCC Geospatial Technologies Program

Meghan Kelly | @meghankellymaps

PhD Candidate, UW-Madison Department of Geography

Nick Lally | @nicklally

Assistant Professor, University of Kentucky Department of Geography

Kristen Vincent | @KristenLyn92

GIS Technician, Stantec Consulting Services

