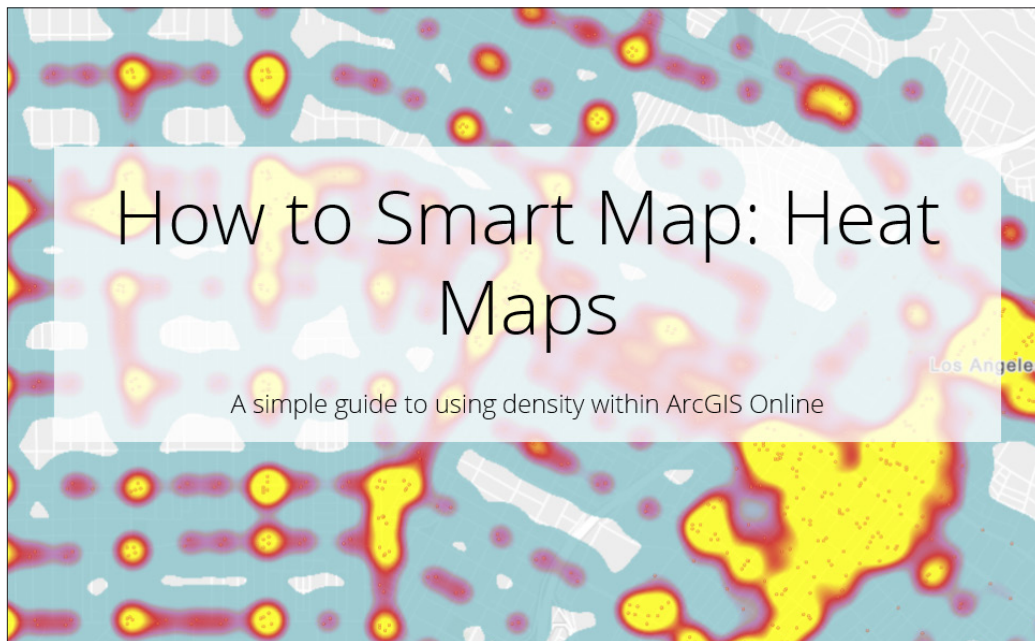


# Displaying crime data with heat maps

Washington, DC, July 2016

Esri has a smart mapping mission to enable anyone to visually analyze, create, and share professional-quality maps. In this lesson, you will analyze point data using heat maps within smart mapping. To begin your journey, explore the story map below.

*How to Smart Map: Heat Maps*



## Build skills in these areas

- ▶ Finding and downloading a CSV file
- ▶ Uploading a CSV file
- ▶ Filtering
- ▶ Changing basemaps

- ▶ Using heat maps at different scales
- ▶ Comparing two variables

## What you need

- ▶ Account required
- ▶ Estimated time: 30 minutes - 1 hour

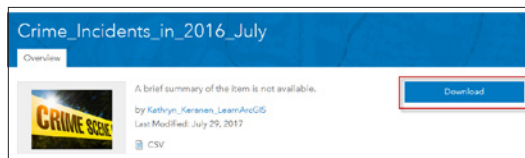
## Scenario

The Washington, DC, police department is planning the deployment of its resources for the month of August. The department would like to see different geographic patterns of criminal behavior on a map. The GIS staff has been given the July data on Friday afternoon and has been tasked with analyzing the data by the Monday morning briefing. The police chief is particularly interested in auto theft and burglary. The chief has asked for the following maps to be produced:

- A map showing total crime concentration
- A map showing auto theft
- A map showing burglary
- Two individual maps of auto theft and burglary for Ward 8

## Find and download a prepared CSV file of July 2016 Washington, DC, crime

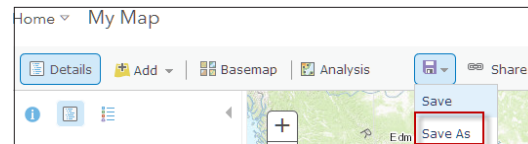
1. Click [Crime Incidents in 2016 July](#).



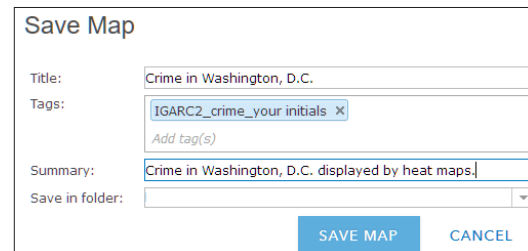
2. Click Download.
3. Save the file to an appropriate place.

## Log in to your organizational account, create new map, save

1. Log in to your [ArcGIS](#) organizational account.
2. Click Map.
3. Click Show Map Contents under Details.
4. On the top menu click Save As.



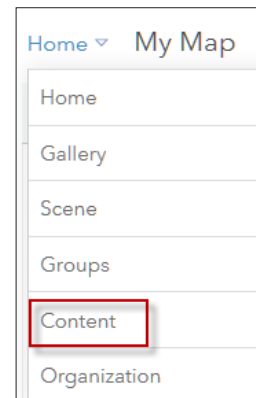
5. In the Save Map menu enter the following information:
  - Title: **Crime in Washington, DC.**
  - Tags: **IGARC2\_crime\_your initials.**
  - Summary: **Crime in Washington, DC, displayed by heat maps.**
6. Click SAVE MAP.



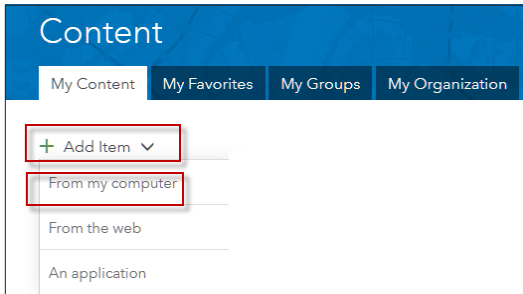
## Upload and publish a prepared CSV file of July 2016 Washington, DC, crime

You can upload a CSV file to your ArcGIS Online file and publish it as a layer.

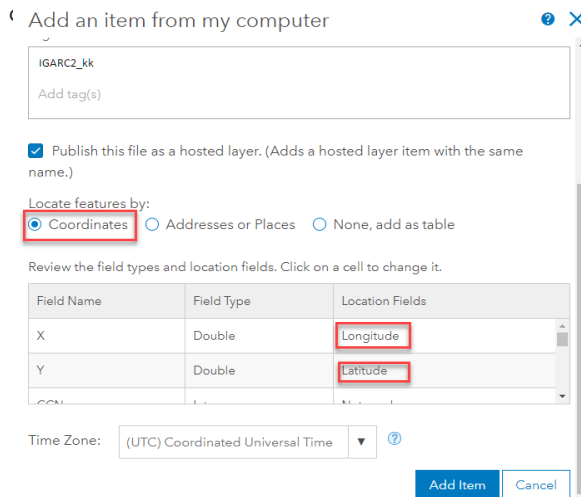
1. In the upper left corner click Home and Select Content.



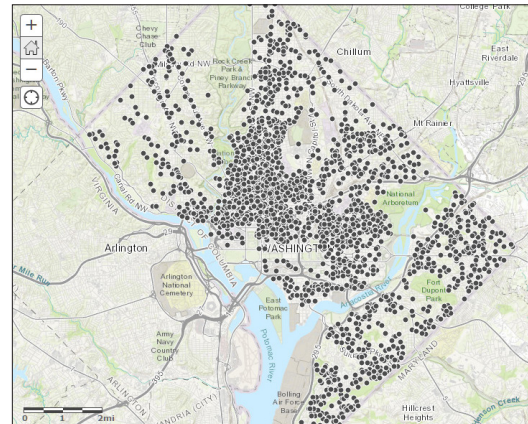
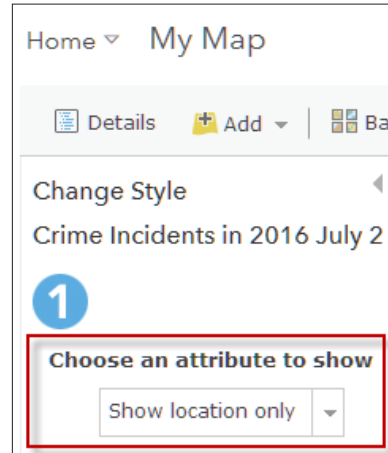
- Click Add Item>>From my computer>>Choose File.



- Browse your computer and find the Crime\_Incidents\_in\_July CSV file.
- Add Tags: IGARC2\_your\_initials.
- Check Publish this file as a hosted layer.
- Coordinates. X -longitude, Y-latitude.
- Add Item.
- Change Choose an attribute to show location only.



- Open in Map Viewer and change Choose an attribute to show to show location only.

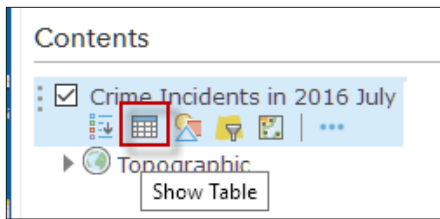


- Click DONE.

Open the attribute table and examine the attributes

- Click Open Table under Crime Incidents in 2016 July.

- Click Change style and change color to red.



- Examine the table of attributes.

X	Y	CCN	REPORT_DAT	SHIFT	METHOD	OFFENSE	BLOCK	XBLOCK	YBLOCK
-76.97958804	38.93262247	16,108,398	7/1/2016, 3:23 PM	EVENING	OTHERS	THEFT F/AUTO	3400 - 3499 BLOCK OF 18TH STREET NE	401,770	140,520
-76.97015496	38.92953059	16,173,968	10/13/2016, 9:01 AM	DAY	OTHERS	THEFT/OTHER	3100 - 3199 BLOCK OF 26TH STREET NE	402,588	140,180
-76.94175668	38.87807317	16,107,983	7/1/2016, 2:16 AM	MIDNIGHT	OTHERS	BURGLARY	4200 - 4299 BLOCK OF 18TH STREET NE	405,054	134,470

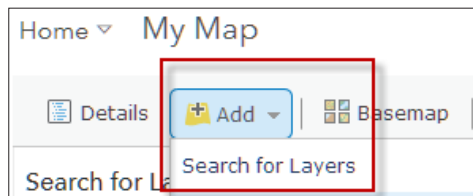
How many total crimes are there?

How many wards?

- Close the table by clicking X in the right corner.

### Another basemap

- On the top menu bar select Add>>Search for Layers.

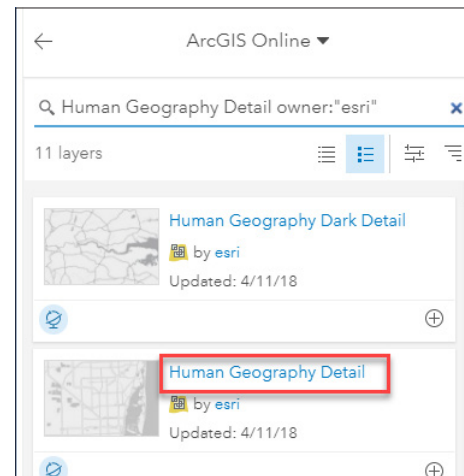


- Search for:

Find: *Human Geography Detail*.

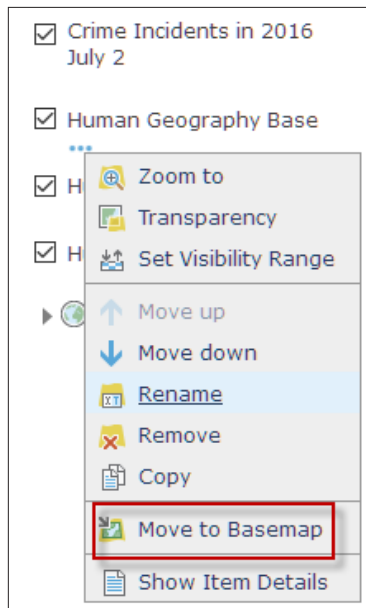
In: ArcGIS Online.

- Add *Human Geography Detail*.

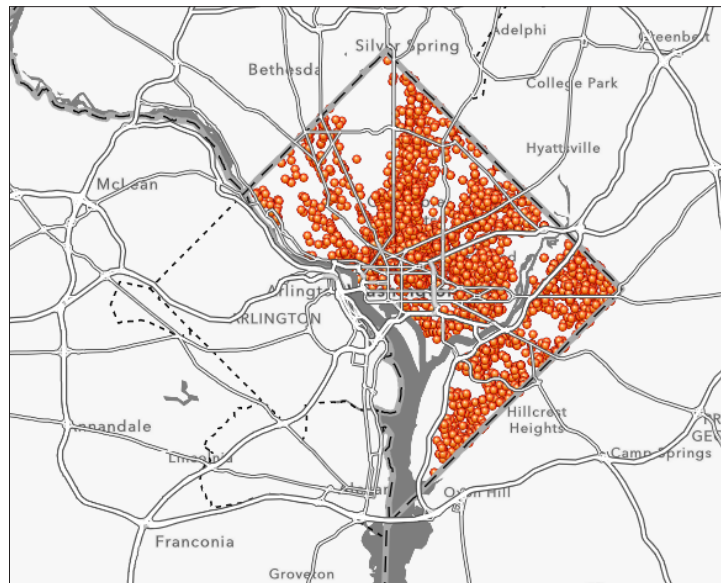
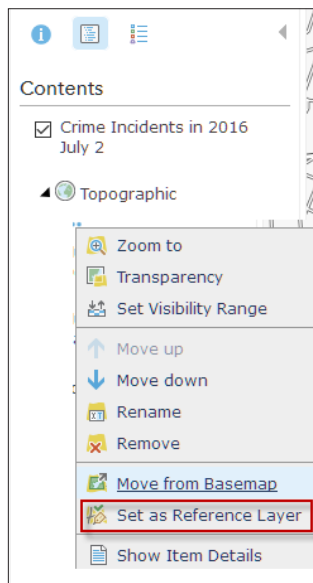


The *Human Geography Detail* map provides a monochromatic style with a detailed reference layer including administrative boundaries, roads, and highways.

4. Click DONE ADDING LAYERS.

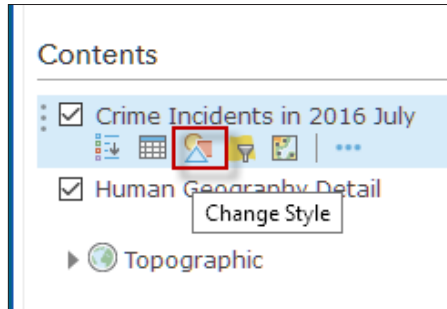


5. Set Human Geography Detail as Reference Layer. The reference layer is not only a visual layer; you can click on a feature in the reference layer and view data associated with that layer.



## Produce a multiscale heat map of total crime in July 2016.

1. Click the Change Style icon under Crime Incidents in 2016 July.



2. Select Heat Map.
3. Click DONE.

*Write a description of where the crime is concentrated.*

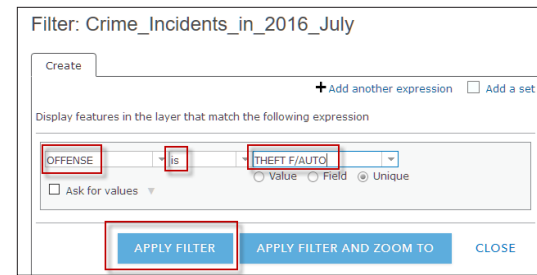
*Does the heat map change as you zoom in and out?*

*Why is a heat map effective to display this crime data?*

## Produce multiscale maps of auto theft and burglary

For this section of the exercise you first want to isolate auto theft, which is represented in the attribute table as THEFT F/AUTO. After analyzing the auto theft map you will then isolate burglaries.

1. Click Filter under the Crime Incidents in 2016 July.
2. Create the following expression: OFFENSE is THEFT F/AUTO. **Be sure to check Unique.**



3. Click APPLY FILTER.

*This selects only the Auto Thefts.*

4. Open the table.

*How many crime incidents are theft auto?*

5. Select the Change Style Icon.

6. Select Heat Map.

7. Click DONE.

*This gives a very different visualization of the data.*

*Where would you direct your personnel to crack down on auto theft?*

8. Repeat steps 3–7 for Burglary. (Remove old expressions first.)

*How many crime incidents are burglary?*

*Where would you direct your personnel to crack down on burglary?*

## Produce maps for ward 8 of auto theft and burglary

In this exercise you are going to concentrate your police effort in ward 8. This requires a double filter.

1. Filter for ward 8.
2. Add an expression.
3. Filter for THEFT/AUTO. (Don't forget to remove previous filter.)

Filter: Crime\_Incidents\_in\_2016\_July

View Edit

+ Add another expression  Add a set

Display features in the layer that match **All** of the following expressions

WARD is 8  Value  Field  Unique  Ask for values

OFFENSE is THEFT F/AUTO  Value  Field  Unique  Ask for values

APPLY FILTER APPLY FILTER AND ZOOM TO CLOSE

4. Click Change Style.
5. Select Heat Map.

*How many auto thefts are there in ward 8?*

*Where is the auto theft most concentrated in ward 8?*

6. Repeat steps 1–5 for burglary.

*How many burglaries are there in ward 8?*

*Where are burglaries most concentrated in ward 8?*

In this exercise you have analyzed crime data using heat maps. You have examined both total crime and specific offenses as well as crime within a specified ward.