Create visualizations in a notebook

In the previous exercise, you performed several spatial data engineering tasks to prepare data for analysis and visualization. In this exercise, you will create intuitive visualizations to communicate the areas of economic vulnerability or displacement of residents to the community-planning organization.

Estimated completion time in minutes: 25

To complete exercises, you need the following:

- ArcGIS Pro 3.5 (Basic, Standard, or Advanced)

1 Download the data

To complete the exercise, you must download the data. If you have already downloaded and installed the data, continue to the next step.

Unable to find the data you downloaded?

After you have downloaded the data ZIP file, extract it to the C:\EsriTraining folder. The unzipped folder will have the same name as the ZIP file.

If you unzipped the data to a location other than C:\EsriTraining, browse to that location and locate the folder. You can also try searching for the folder within File Explorer.

2 Prepare a notebook

First, you will open an ArcGIS notebook.

a

If necessary, start ArcGIS Pro, sign in using your ArcGIS Online organizational account, and open the WorkingWithData project.

Hint: The WorkingWithData project is stored in **C:\EsriTraining\NotebooksDSW\WorkingWithData\WorkingWithData.aprx**.

b If necessary, close any open maps.

c In the Catalog pane, expand Maps, and then double-click Data Visualization.

A map that displays a feature class that represents economic risk in Portland, Oregon, opens.

d
In the Catalog pane, expand Notebooks, and then right-click the DataVisualization.ipynb notebook and choose Open.

e Right-click the DataVisualization tab and choose New Horizontal Tab Group.

Now that you have successfully opened the notebook, you will modify it to load data from a local file system.

3 Explore the data

Using ArcGIS Notebooks functionality, you will code a notebook cell to load analysis-specific data into the notebook.

a
In the notebook, confirm that the cell importing the libraries to be used in the notebook is selected.

View result →

Step 3a: Explore the data.

b To import the libraries, click the Run button ▶.

In the notebook, the cell that sets the environment's workspace property is selected.

c
Set the environment's workspace property to **`r"C:\EsriTraining\NotebooksDSW\WorkingWithData\WorkingWithData.gdb"`**.

View code

```
arcpy.env.workspace = r"C:
\EsriTraining\NotebooksDSW\WorkingWithData\WorkingWithData.gdb"
```

ⓓ To set the environment's workspace, click the Run button ▶.

In the notebook, the selected cell creates a list of feature classes and assigns the fc_vulnerability variable to the Vulnerability feature class.

ⓔ To access the specified feature class in the workspace, click the Run button ▶.

Now that you have successfully imported the libraries into the notebook and modified the notebook to access a feature class from the WorkingWithData geodatabase, you will modify the notebook to view information about the feature class.

The selected cell contains code for describing a feature class or table.

ⓕ
To access description information about the Vulnerability feature class, set the Describe methods argument to the variable **`fc_vulnerability`**.

View code

```
desc = arcpy.Describe(fc_vulnerability)
print("Dataset Type: " + desc.datasetType)
print("Feature Type: " + desc.featureType)
print("Shape Type : " + desc.shapeType)
print("Spatial Index: " + str(desc.hasSpatialIndex))
print("Map Extent: " + str(desc.extent))
```

ⓖ To access description information about the feature class, click the Run button ▶.

Which description items are accessed from the Vulnerability feature class?

Show answer

Dataset Type, Feature Type, Shape Type, Spatial Index, Map Extent

The description also provides field information about a feature class. For example, the field name and type are easily obtained by iterating through the description object's fields.

The selected cell contains code for iterating through the Vulnerability feature class's fields.

```
[ ]: for field in desc.fields:
         print(f"{field.name}:{field.type}")
```

(h) To iterate through the feature class's fields, click the Run button ▶.

Now that you have explored the feature class's properties and fields, you will configure a graduated color renderer for displaying economic vulnerability.

(4) Visualize the data in the map

To visualize economic vulnerability, you will apply symbology to the feature class to create a choropleth map. You will modify code to access the ArcGIS project's feature layer and change the layer's symbology.

(a)

If necessary, in the notebook, select the cell that is used to access the current ArcGIS project and map, as shown in the following graphic.

```
[ ]: aprx = arcpy.mp.ArcGISProject("CURRENT")
     gen_map = aprx.listMaps(arcpy.GetParameter(5))[1]
```

(b) Click the Run button ▶.

Next, you will reference the Vulnerability map layer in the current project.

(c)

For the cell containing `layer = gen_map.listLayers()[1]`, click the Run button ▶.

You will now symbolize the Vulnerability feature layer based on the Vulnerabil field values.

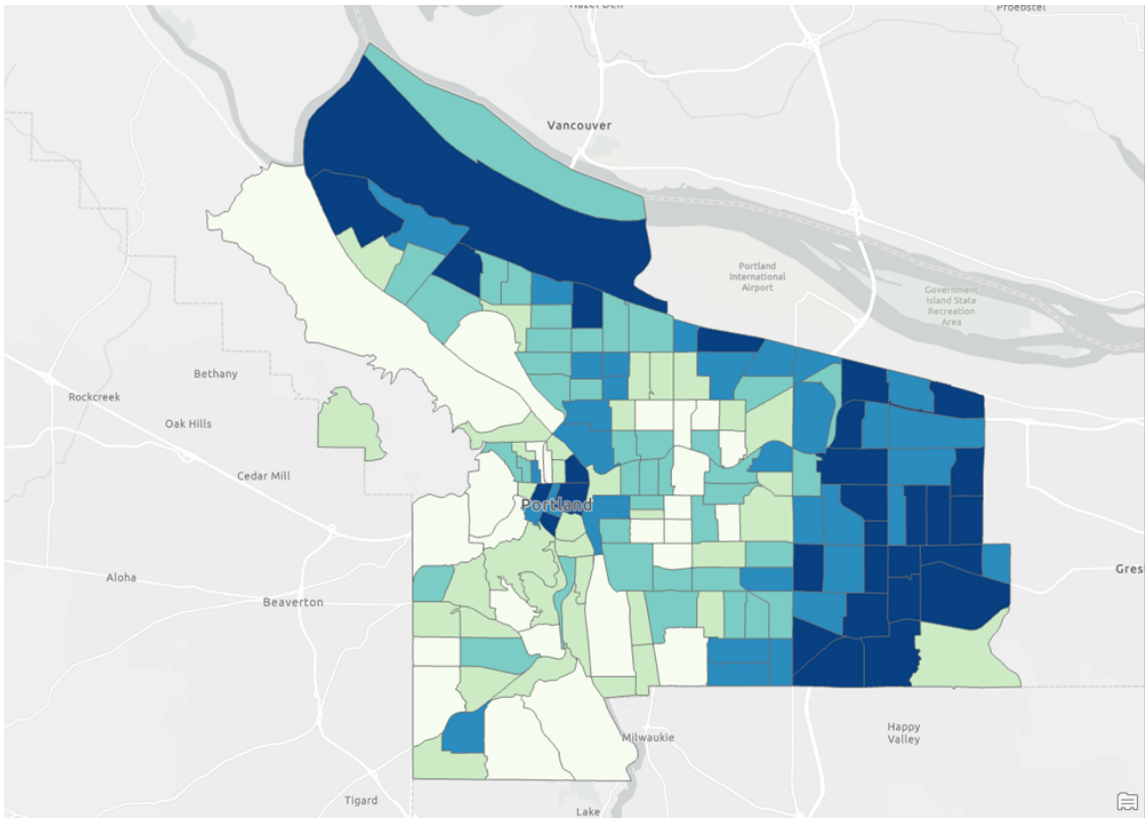
ⓓ Add the **`vulnerabil`** field to the list of fields to use for rendering the feature layer.

View code

```
sym = layer.symbology
sym.updateRenderer("GraduatedColorsRenderer")
sym.renderer.classificationField = 'vulnerabil'
sym.renderer.breakCount = 5
sym.renderer.colorRamp = aprx.listColorRamps('Green-Blue
(Continuous)')[0]
layer.symbology = sym
```

ⓔ To apply the updated renderer to the map, click the Run button ▶.

View result →



Step 4e: Visualize the data in the map.

The resulting choropleth map displays areas that have the highest risk of economic vulnerability in blue. The northwestern and eastern portions of the city have the highest economic vulnerability.

(f) On the Notebook tab, click Save.

(g) Save the project, then exit ArcGIS Pro.

In this exercise, you used an ArcGIS notebook in ArcGIS Pro to explore the feature class's data structure, and you created a map visualization displaying the areas of economic vulnerability

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