



# Data Analysis

Where should we move to?

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The background is a light orange color with a dashed orange grid. On the right side, there is a large, curved, light blue area. In the top left, there are brown topographic contour lines. In the bottom left, there are more brown topographic contour lines. In the center, there are three blue 'x' marks and three pink dots. In the bottom left, there are four light blue triangles.

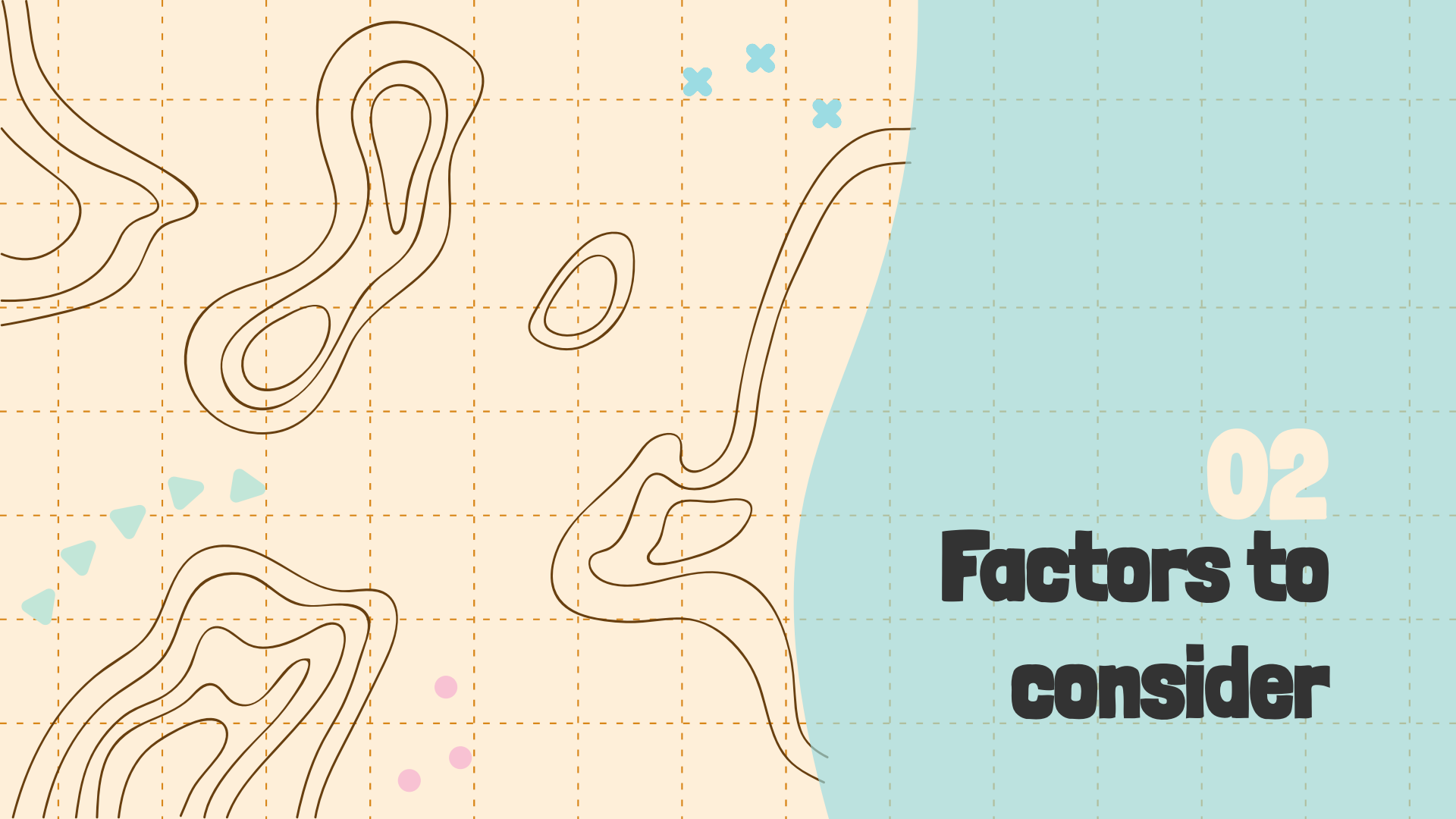
01

# Introduction

# Where should we move to?

We'll be applying skills learnt between weeks 4 and 8, including Slice, Reclassify, Select by Attributes, Join, etc., to find the perfect relocation spot.

Using ArcGIS Pro, we'll analyze data layers to assess factors like affordability, weather, and nearness to urban areas and recreational bodies, among others.



## 02 Factors to consider

# Factors to consider...

01



## Temperature Zones

Our ideal average temperature in a city was approximately 60°F

02



## Within a major city

As college students, it's more convenient for us to live in a major city for work and school, but not one with a population too big or too small

03



## Near a body of water

We both love going to the beach during the summer, so we looked for cities within 100 miles of a water body

04



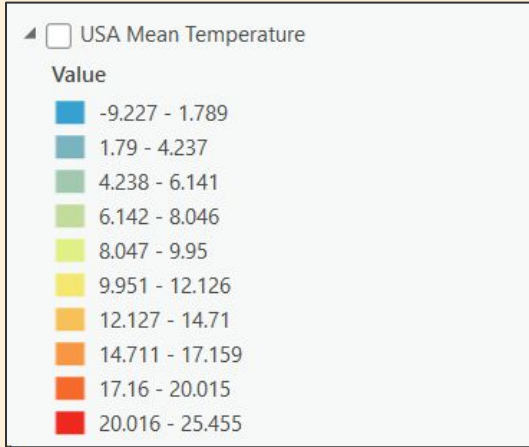
## Low cost of Living

The National benchmark is 100 so the aim is to move to somewhere below that

A stylized topographic map background on the left side of the slide. It features brown contour lines of varying thicknesses and dashed brown lines, overlaid on a light orange grid. The map lines are more prominent on the left and fade out towards the right.

# Temperature Zones

Our ideal average temperature  
in a city was approximately 60°  
F



Data was downloaded in raster format in annual mean temperatures for each month (°C) from 1971-2009.

Geoprocessing

← Slice →

Parameters Environments

Input raster  
USA Mean Temperature

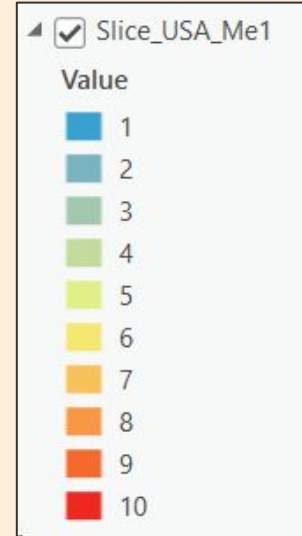
Output raster  
Slice\_USA\_Me1

Slice method  
Equal interval

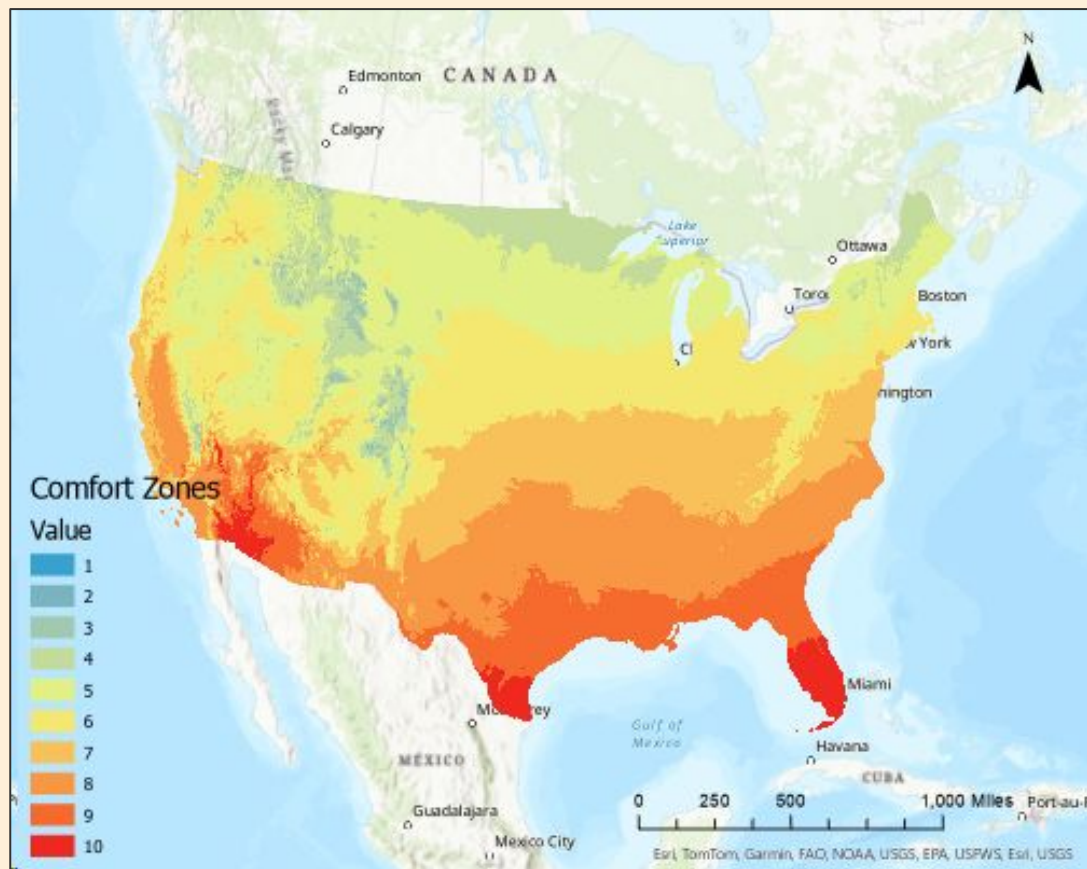
Number of output zones  
10

Starting value for output  
1

Change NoData to value for output



**Slice** the information into 10 categories from a range of 1-10 to more easily classify the temperature zones.





Geoprocessing

Reclassify

Parameters Environments

Input raster  
Comfort Zones

Reclass field  
Value

Reclassification

Reverse New Values

Value	New
1	NODATA
2	NODATA
3	NODATA
4	NODATA
5	NODATA
6	NODATA
7	1
8	1
9	NODATA
10	NODATA
NODATA	NODATA

Classify Unique

Output raster  
Reclass\_Slic1

Our ideal temperature was 60°F which is approximately 16°C.

**Reclassify** to choosing only zones 7 and 8 and setting everything else to NODATA.



Geoprocessing

← Raster to Polygon +

Parameters Environments ?

Input raster  
Comfort Zone

Field  
Value

Output polygon features  
RasterT\_Reclass1

☒ Simplify polygons  
☐ Create multipart features

Maximum vertices per polygon feature



**Raster to Polygon** for easier workability

A stylized topographic map graphic on the left side of the image. It features brown contour lines of varying thicknesses on a light beige background. A grid of dashed orange lines is overlaid on the map. The map shows a complex, wavy pattern of lines, with some areas enclosed by dashed lines, suggesting a specific region or boundary.

# Within a major city

As college students, it's more convenient  
for us to live in a major city for work and  
school

### Display XY Data

Parameters Environments

Input Table  
USA\_Major\_Cities.csv

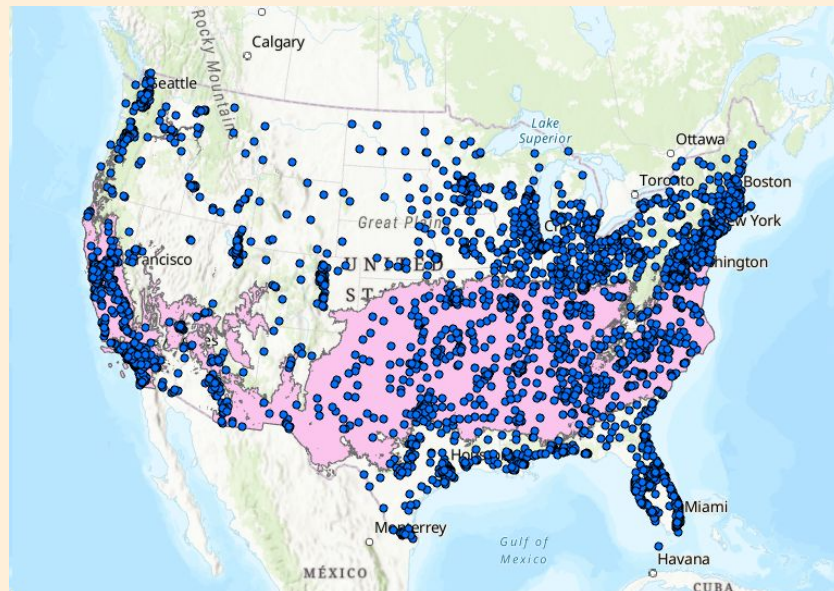
Output Feature Class  
USA\_Major\_Cities\_XYTableToPoint

X Field  
X

Y Field  
Y

Z Field

Coordinate System  
GCS\_WGS\_1984



Data was imported as a **CSV** and converted to **XY Data**



## Select By Location

Input Features

USA\_Major\_Citi\_ExportFeature

Relationship

Intersect

Selecting Features

Comfort Zone\_Polygon

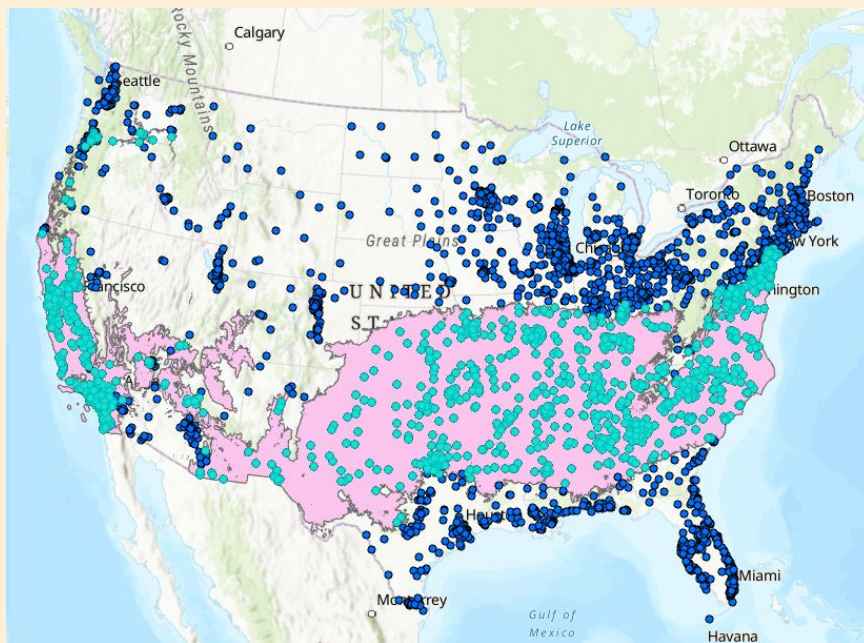
Search Distance

Decimal Degrees

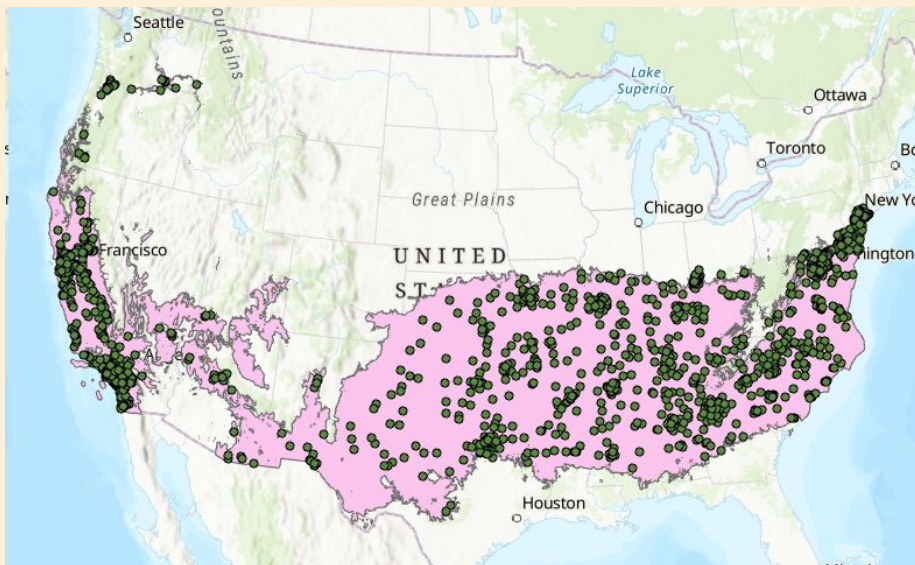
Selection Type

New selection

☐ Invert Spatial Relationship



**Selecting by Location** only the cities that fell within the comfortable (pink) range



### Export Features

**Parameters** Environments


Input Features  
USA\_Major\_Cities\_XYTableToPoint

**i** The input has a selection. Records to be processed: 1,663

Output Feature Class  
USA\_Major\_Citi\_ExportFeature1

> Filter  
> Fields  
> Sort

**Exporting Features** into a separate point class

A stylized topographic map background on the left side of the image. It features brown contour lines of varying thicknesses on a light beige background. A dashed orange grid is overlaid on the map. The map shows a complex, wavy pattern of land and water, with some areas enclosed by dashed lines.

# Near a body of water

We both love going to the beach during the  
summer, so we looked for cities within 100  
miles of a water body

**Select By Attributes** ? x

Input Rows  
World Water Bodies v

Selection Type  
New selection v

Expression  
Load Save Remove

SQL ☐

Where TYPE is equal Ocean or Sea x

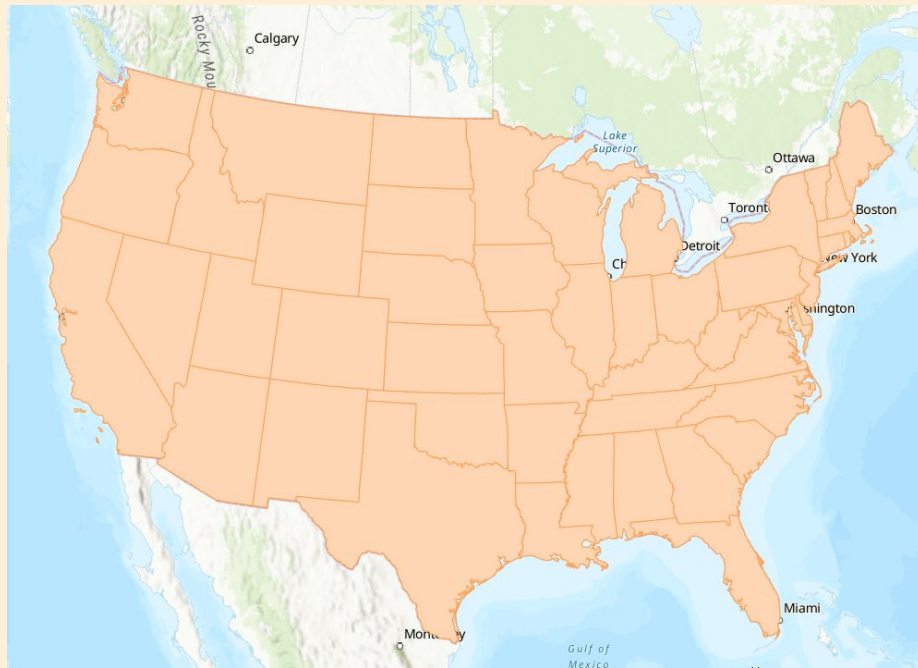
+ Add Clause

☐ Invert Where Clause



World water bodies was downloaded as a shapefile. **Select by Attributes** to only select oceans/seas, which eliminated rivers, lakes and other internal water bodies.





USA Boundary Map was imported

Geoprocessing

Buffer

The Pairwise Buffer tool provides enhanced functionality or performance.

Parameters Environments

Input Features  
USA\_States\_Generalized

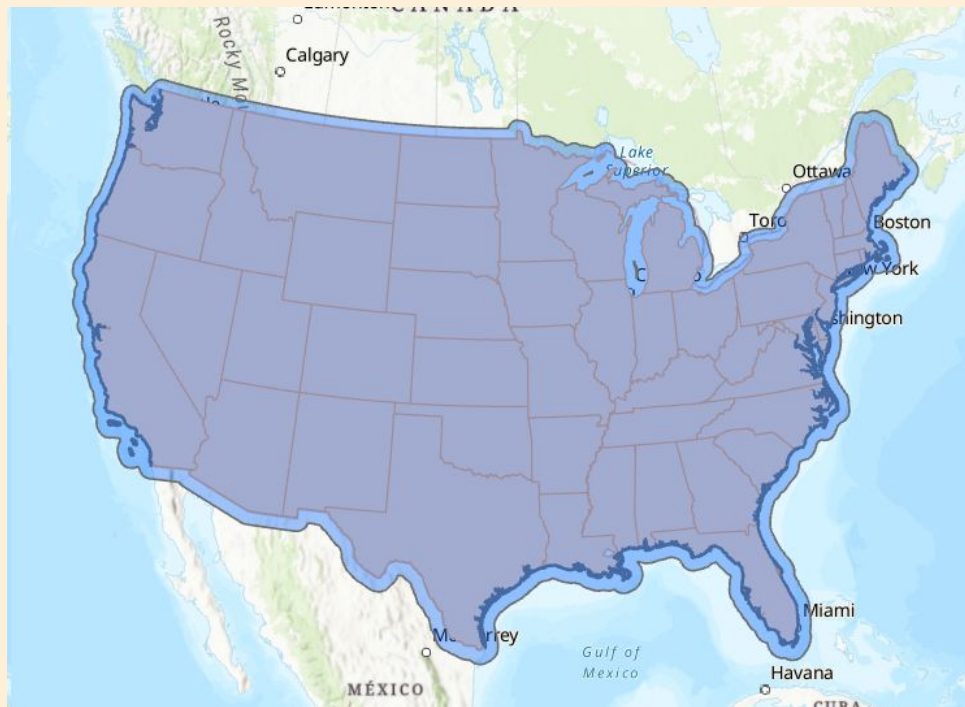
Output Feature Class  
USA\_States\_Generalize\_Buffer1

Distance [value or field]  
5 US Survey Miles

Side Type  
Full

Method  
Planar

Dissolve Type  
Dissolve all output features into a single feature



**Buffer** around the United States Boundary Map of 5 miles

**Geoprocessing** ⌵ 📏 ✕

⬅ **Intersect** ⊕

**i** The Pairwise Intersect tool provides enhanced functionality or performance. ✕

**Parameters** **Environments** ?

**Input Features** ⌵ **Ranks**

Ocean/Sea	<span>📁</span>	
tes_Generalize_Buffer1	<span>📁</span>	
	<span>📁</span>	

**Output Feature Class**

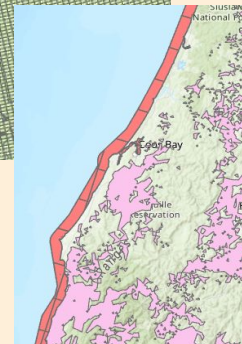
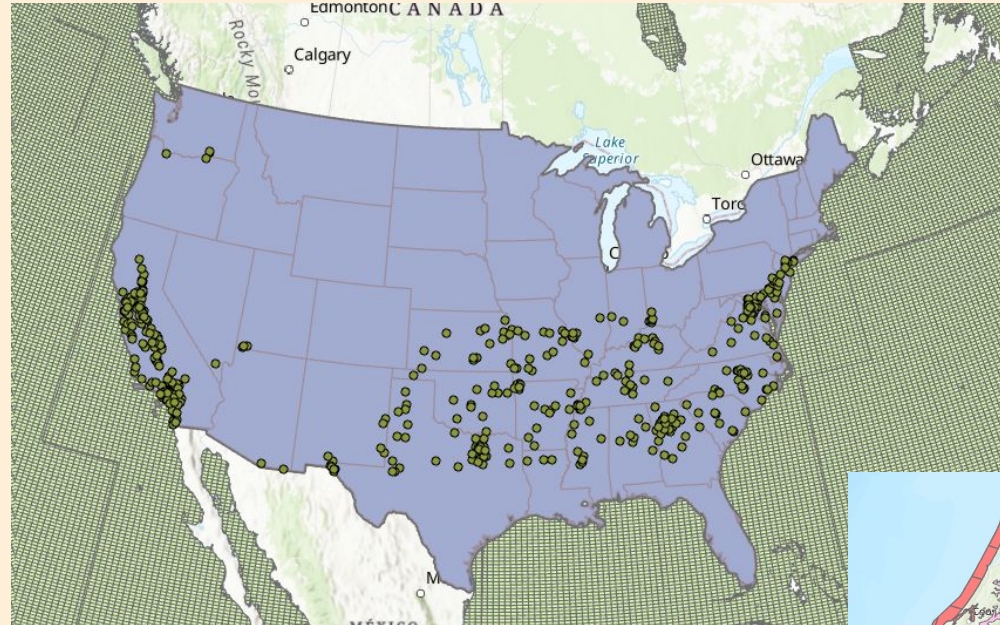
OceanSea\_Intersect 📁

**Attributes To Join**

All attributes ⌵

**Output Type**

Same as input ⌵



**Intersect Tool** for the United States Boundary Map of 5 miles and the Ocean/Sea to narrow down the water bodies polygon class to only water around the USA thus creating a polygon feature class of the USA Coastlines.



### Select By Location

Input Features 

USA\_Major\_City\_ComfortZone 

 The input has a selection. Records to be processed: 892

Relationship

Within a distance geodesic 

\* Selecting Features



Search Distance

100

US Survey Miles 

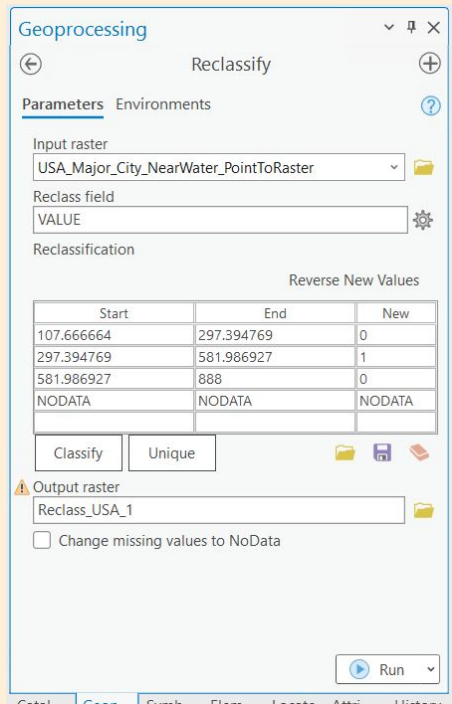
Selection Type

New selection 

☐ Invert Spatial Relationship



Using the **Select by Location** tool to only highlight the cities within 100 miles of the coastline

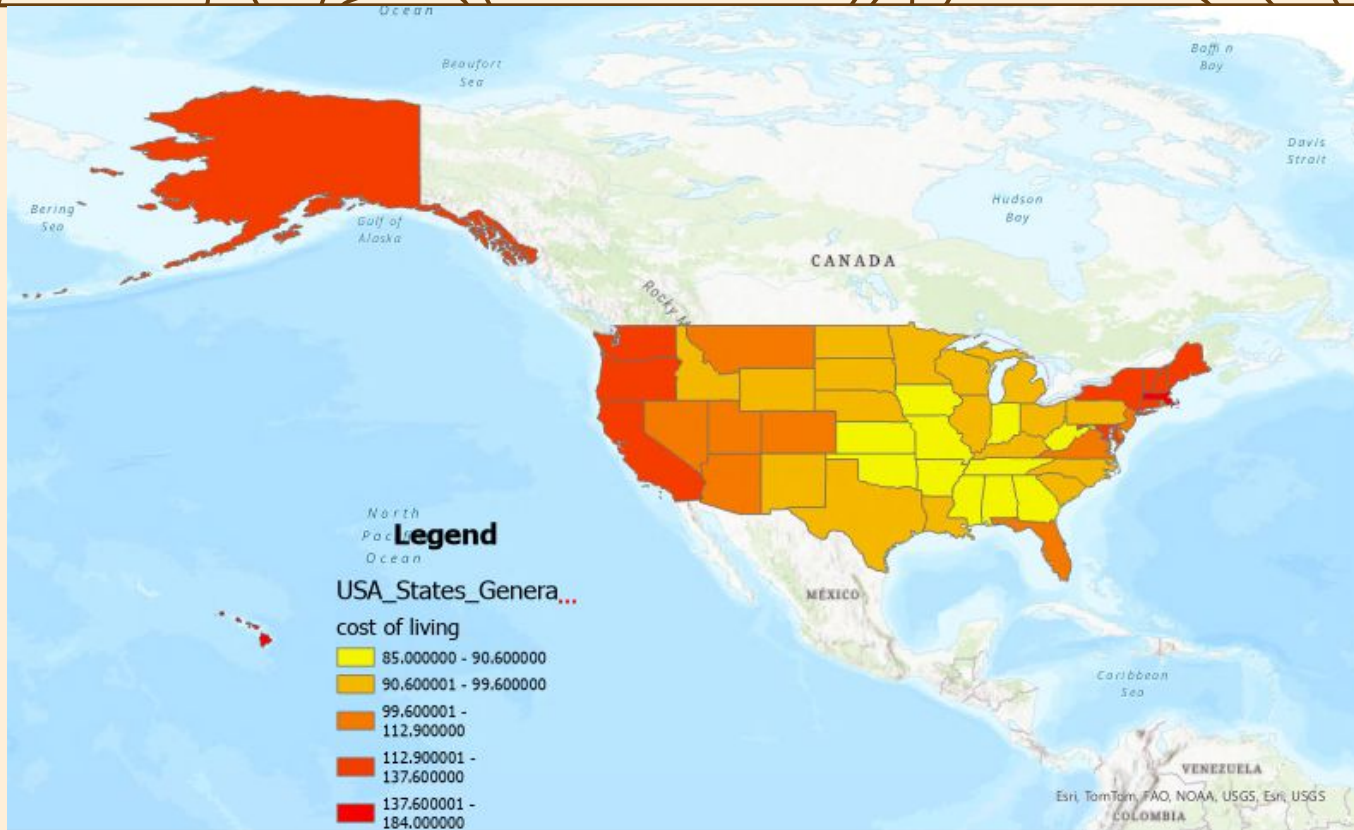


We then did a Point to Raster using the population field to make the cities near water a Raster data. Thereafter, we reclassified the raster to find cities with mid-sized population because we did not want to live in a very large city, nor did we want to live in a smaller city.

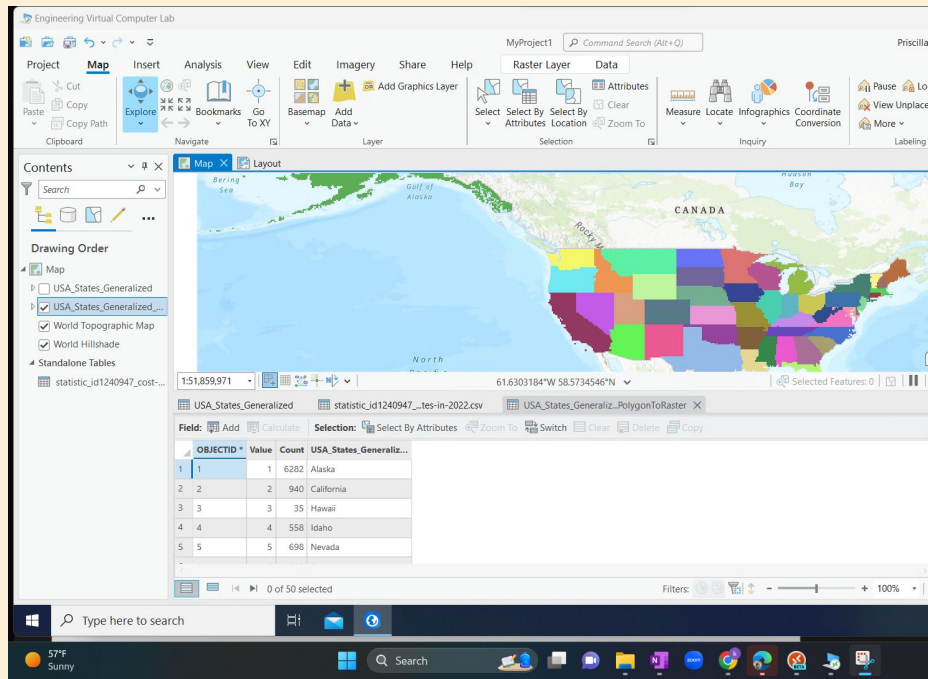
A stylized topographic map background on the left side of the slide. It features brown contour lines of varying thicknesses and dashed brown lines, overlaid on a light orange grid. The map depicts a hilly or mountainous terrain.

# Low Cost of Living

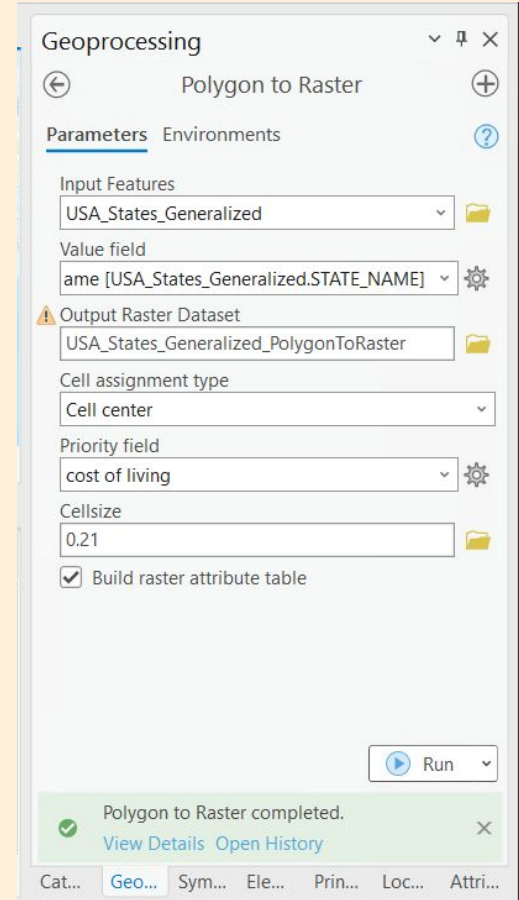
The National benchmark is 100 so the aim is to move to somewhere below that



General cost of living of all U.S states.



Imported the U.S. States as polygon data and proceeded to change the polygon to a Raster using the **Polygon to Raster** tool.





**Add Join** ? x

Input Table  
USA\_States\_Generalized\_PolygonToRaster

Input Join Field  
USA\_States\_Generalized\_STATE\_NAME

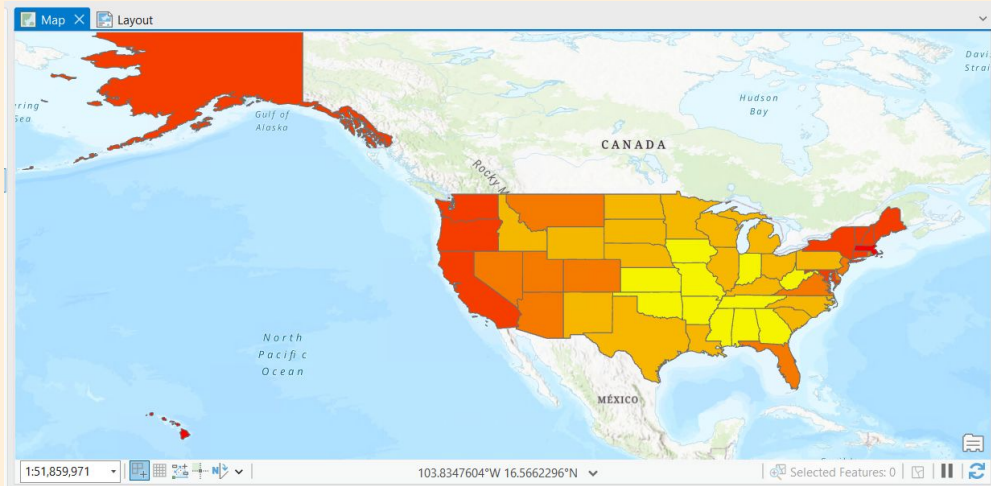
Join Table  
statistic\_id1240947\_cost-of-living-index-in-the-50-us-states-i

Join Table Field  
Name

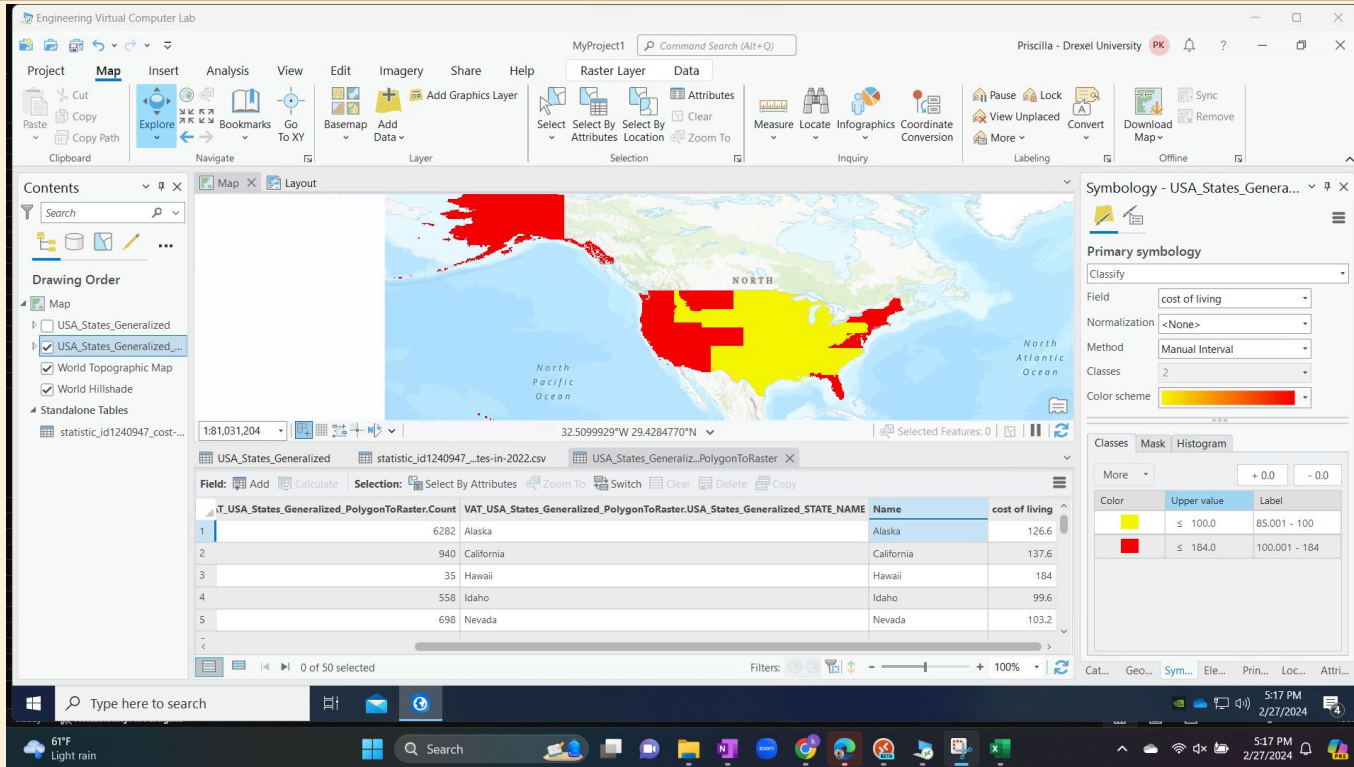
☒ Keep All Target Features  
☐ Index Joined Fields

Validate Join

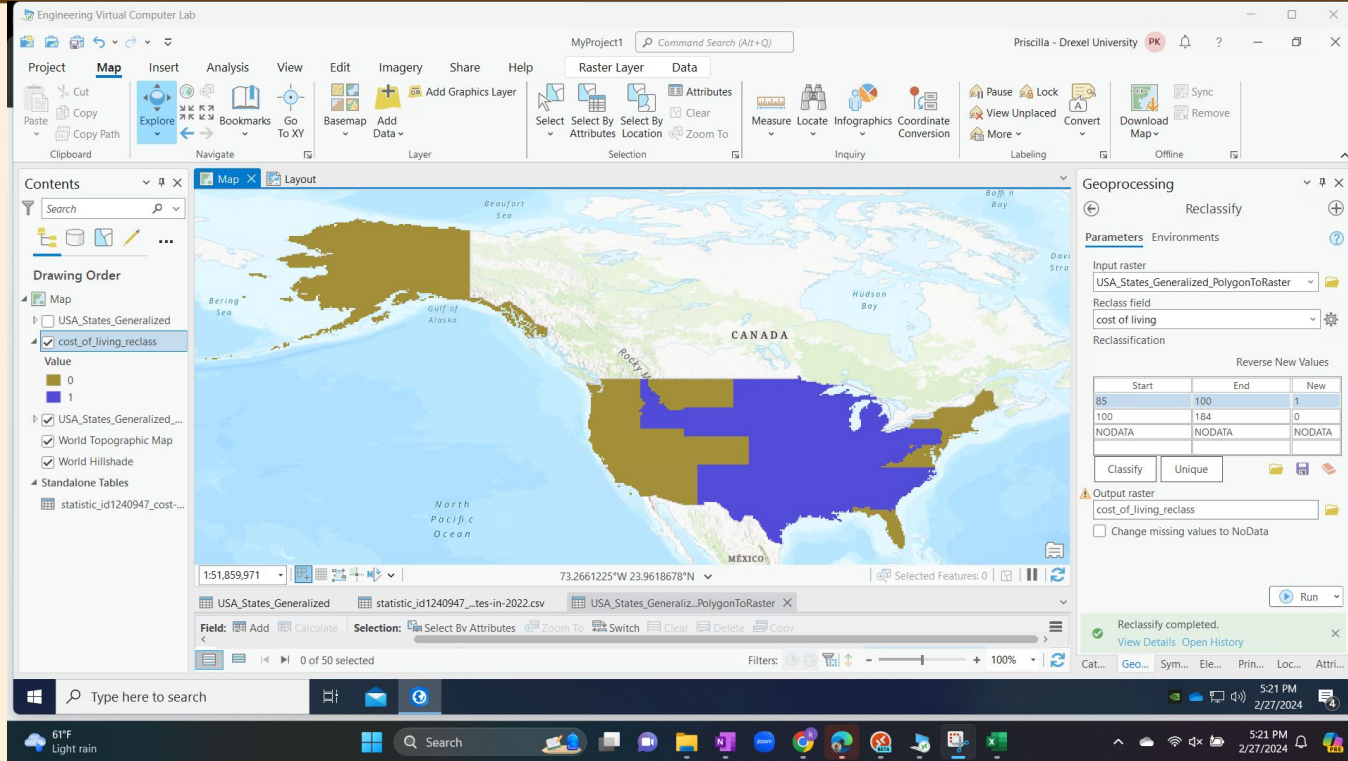
OK



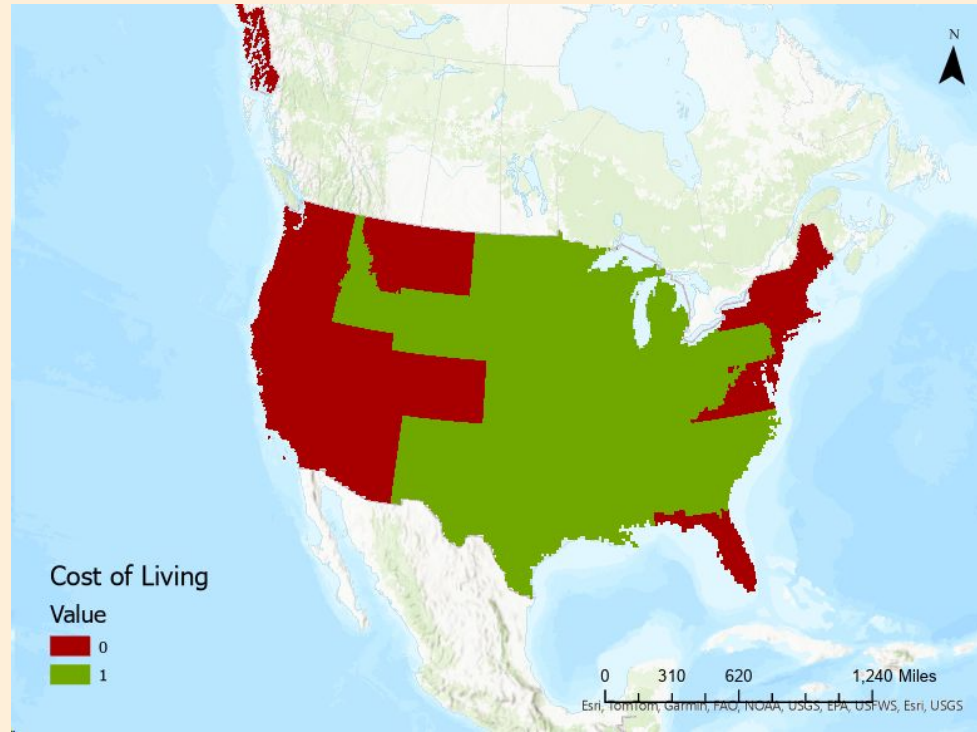
Went on to add the Cost of Living Data which was contained in a csv table to the Raster data. The **Add Join** tool was used for this step



As mentioned in the introduction, the U.S. average cost of living is 100 so we edited the **Symbology** to differentiate the states with lower cost of living from those with higher living costs.



Using this symbology, we were able to use the **Reclassify** tool to reclassify the Raster data into the two classes i.e. 1 - Lower cost of living, 0 - Higher cost of living.

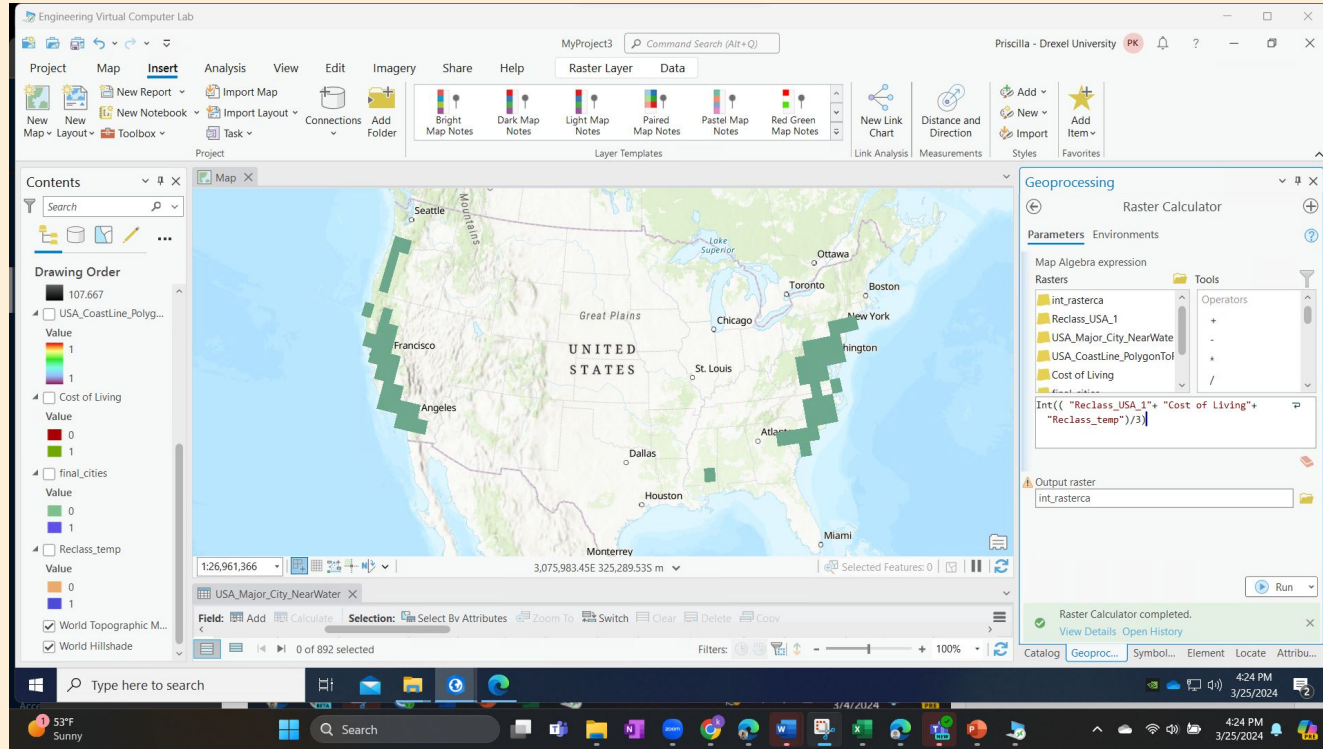


Overall, the red zones are high costs of living, while green zones mark a low cost of living

# Raster Calculate







To narrow down suitable locations, we used raster calculate with the reclassified cities near water raster, the cost of living raster, and the reclassified temperature raster. The outcome was the location colored green on the map.

The background is a light orange color with a dashed orange grid. On the left, there are several brown contour lines of varying shapes. In the top right, there are three small blue 'x' marks. In the bottom left, there are four small teal triangles pointing right. In the bottom center, there are three small pink circles. A large, curved, light blue shape occupies the right side of the image, partially overlapping the orange background.

04

# References

- <https://hub.arcgis.com/datasets/1612d351695b467eba75fdf82c10884f/explore?location=29.499214%2C-99.025106%2C4.34>
- <https://www.arcgis.com/home/item.html?id=e750071279bf450cbd510454a80f2e63>
- <https://www.arcgis.com/home/item.html?id=4bd9b6892530404abfe13645fcb5099a>
- <https://hub.arcgis.com/content/e750071279bf450cbd510454a80f2e63/about>
- <https://hub.arcgis.com/datasets/esri::usa-major-cities/explore?location=36.022578%2C-98.000042%2C4.12>
- <https://www.arcgis.com/home/item.html?id=4c6c0d9b6c294664afad07a326a37aca>
- Website (Missouri Economic Research and Information Center). (January 2, 2023). Composite cost of living index in the different states of the United States as of 2022 [Graph]. In *Statista*. Retrieved February 26, 2024, from <https://www.statista.com/statistics/1240947/cost-of-living-index-usa-by-state/>