Homework 7

Using arcpy and/or arcgis packages from ESRI ArcGIS, create a script tool forGeoprocessing or a Notebook in ArcGIS Pro. Alternatively, you can create a generic JupyterNotebook using these two packages from ESRI.

From now on, you are expected to plan on your final project. Try to make the assignmentspart of your final project whenever it applies. At least, you should use the assignments toverify the methods or technologies for your final project. If you haven't had a direction foryour project yet, you can recycle what you did in other GIS courses and see if you canautomate some of the manual works and make a nice Geoprocessing tool or PythonNotebook.

1. Looking at the data

In [45]:
```
import arcpy
```

In [22]:
```
#environment workspace
arcpy.env.workspace = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\
FINALProject_GIS_DATA\COB_Flood_Data\COB_10PCT_Annual_Flood'
```

In [23]:
```
feature_list = arcpy.ListFeatureClasses()
```

In [24]:
```
print(feature_list)
```

```
['_21inch_Sea_Level_Rise__10pct_Annual_Flood.shp', '_36inch_Sea_Level_Rise_10pct_Annual
_Flood.shp', '_9inch_Sea_Level_Rise_10pct_Annual_Flood.shp']
```

2. Select by Location

Turning Sea Level Rise and Focal Resources shapefiles into feature layers

In [75]:
```
#focal resources
cultural_points = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\Focal Resource Shapefiles\Cultural_FocalResources_9Islands.shp'
infrastructure_points = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\Focal Resource Shapefiles\Infrastructure_FocalResources_9Islands.shp'

#SLR (10pct)
nine_in_SLR_ten_pct = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\COB_Flood_Data\COB_10PCT_Annual_Flood\_9inch_Sea_Level_Rise_10pct_Annual_Flood.shp'
twentyone_in_SLR_ten_pct = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\COB_Flood_Data\COB_10PCT_Annual_Flood\_21inch_Sea_Level_Rise__10pct_Annual_Flood.shp'
thirtysix_in_SLR_ten_pct =r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\COB_Flood_Data\COB_10PCT_Annual_Flood\_36inch_Sea_Level_Rise_10pct_Annual_Flood.shp'

#Folder for future outputs
outpath = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\FocalResources_SLR_WITHIN'
```

Selecting cultural and infrastructure points within 9in (10pct) SLR layer

In [76]:
```
#Creating feature layers from shapefile
##focal resources
arcpy.MakeFeatureLayer_management(cultural_points, 'cultural_layer')
arcpy.MakeFeatureLayer_management(infrastructure_points, 'infrastructure_layer')
```

Out[76]:

Messages

In [77]:
```
##SLR
arcpy.MakeFeatureLayer_management(nine_in_SLR_ten_pct, '9in_SLR_10pct_layer')

#Selecting points within a layers (SLR)
arcpy.management.SelectLayerByLocation('cultural_layer', 'WITHIN', '9in_SLR_10pct_laye
r')
arcpy.management.SelectLayerByLocation('infrastructure_layer', 'WITHIN', '9in_SLR_10pc
t_layer')

#Creating a feature class based on the parameters
arcpy.FeatureClassToFeatureClass_conversion('cultural_layer', outpath, 'CulturalPoints
_within_9in_10pct')
arcpy.FeatureClassToFeatureClass_conversion('infrastructure_layer', outpath, 'Infrastr
ucturePoints_within_9in_10pct')
```

Out[77]:

Messages

Selecting cultural and infrastructure points within 21in (10pct) SLR layer

In [78]:
```
##SLR
arcpy.MakeFeatureLayer_management(twentyone_in_SLR_ten_pct, '21in_SLR_10pct_layer')

#Selecting points within a layers (SLR)
arcpy.management.SelectLayerByLocation('cultural_layer', 'WITHIN', '21in_SLR_10pct_la
yer')
arcpy.management.SelectLayerByLocation('infrastructure_layer', 'WITHIN', '21in_SLR_10
pct_layer')

#Creating a feature class based on the parameters
arcpy.FeatureClassToFeatureClass_conversion('cultural_layer', outpath, 'CulturalPoint
s_within_21in_10pct')
arcpy.FeatureClassToFeatureClass_conversion('infrastructure_layer', outpath, 'Infrast
ructurePoints_within_21in_10pct')
```

Out[78]:

Messages

Selecting cultural and infrastructure points within 36in (10pct) SLR layer

In [79]:
```
##SLR
arcpy.MakeFeatureLayer_management(thirtysix_in_SLR_ten_pct, '36in_SLR_10pct_layer')

#Selecting points within a layers (SLR)
#arcpy.management.SelectLayerByLocation('cultural_layer', 'WITHIN', '36in_SLR_10pct
_layer')
arcpy.management.SelectLayerByLocation('cultural_layer', 'WITHIN', '36in_SLR_10pct_
layer')
arcpy.management.SelectLayerByLocation('infrastructure_layer', 'WITHIN', '36in_SLR_
10pct_layer')

#Creating a feature class based on the parameters
arcpy.FeatureClassToFeatureClass_conversion('cultural_layer', outpath, 'CulturalPoi
nts_within_36in_10pct')
arcpy.FeatureClassToFeatureClass_conversion('infrastructure_layer', outpath, 'Infra
structurePoints_within_36in_10pct')
```

Out[79]:

Messages

3. Select by location using a for loop

Using layer with all the resource data within 9in (10pct) SLR layer

In [85]:
```
arcpy.env.overwriteOutput = True

all_resources_points = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\All_Resources\AllResources_XYCompiledData_9Islands.shp'
categories_of_interest = ['Infrastructure','Cultural','Vegetation','Bluff']

outpath2 = r'C:\Users\amyca\OneDrive\Documents\GTECH732_AdvGIS\Final Project\FINALProject_GIS_DATA\ALLResources_SLR_Output'

arcpy.MakeFeatureLayer_management(all_resources_points, 'all_resources_layer')
```

Out[85]:

Messages

In [86]:
```
for x in categories_of_interest:
    arcpy.MakeFeatureLayer_management(all_resources_points, 'all_resources_layer',""" "Category" = '{}'""".format(x))
    arcpy.management.SelectLayerByLocation('all_resources_layer', 'WITHIN', '9in_SLR_10pct_layer')
    arcpy.FeatureClassToFeatureClass_conversion('all_resources_layer', outpath2, '{}_BU_ResourcePoints_within_9in_10pct'.format(x))
```

Using layer with all the resource data within 21in (10pct) SLR layer

In [87]:
```
for x in categories_of_interest:
    arcpy.MakeFeatureLayer_management(all_resources_points, 'all_resources_layer',""" "Category" = '{}'""".format(x))
    arcpy.management.SelectLayerByLocation('all_resources_layer', 'WITHIN', '21in_SLR_10pct_layer')
    arcpy.FeatureClassToFeatureClass_conversion('all_resources_layer', outpath2, '{}_BU_ResourcePoints_within_21in_10pct'.format(x))
```

Using layer with all the resource data within 36in (10pct) SLR layer

In [88]:
```
for x in categories_of_interest:
    arcpy.MakeFeatureLayer_management(all_resources_points, 'all_resources_layer',""" "Category" = '{}'""".format(x))
    arcpy.management.SelectLayerByLocation('all_resources_layer', 'WITHIN', '36in_SLR_10pct_layer')
    arcpy.FeatureClassToFeatureClass_conversion('all_resources_layer', outpath2, '{}_BU_ResourcePoints_within_36in_10pct'.format(x))
```