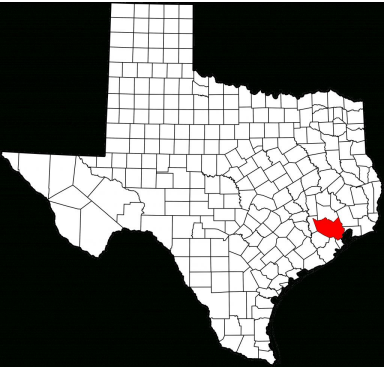


Topic: A GIS-based Visualization of Pollution and Community Park Land Suitability Analysis in Harris County, Texas

Final Project Presentation

GEOG 392/676: GIS PROGRAMMING

Team Lead: Joe Johnson



Team Members

Sr. No	Member Name	Email ID	Student Role
1	Joe Johnson	joejohnson2905@tamu.edu	Graduate
2	Robert Arends	rugbug@tamu.edu	Undergraduate
3	Humza Ahmed	humza.ahmed25@tamu.edu	Undergraduate
4	Zachary Roberts	zacharyjroberts24@tamu.edu	Undergraduate
5	Ian McDowell	ianmcd22@tamu.edu	Undergraduate

Team Member Responsibilities

Task split-up:

Task	Data Collection	GIS Analysis	Final Report	Poster	Git Upload	Demo Video
Joe Johnson	X	X	X		X	X
Robert Arends	X		X	X		X
Humza Ahmed		X	X	X		X
Zachary Roberts	X		X	X		X
Ian McDowell	X		X	X		X

Deliverables/Objective

- The goal of this project is to **evaluate available undeveloped land for proposing a community park** based on **pollution level parameters** that are deemed suitable for the park and the Harris County community.
- This helps to **alleviate** the issue of health hazard due to pollution for outdoor activities in the future.
- To benefit more residents, the new community park should be in the neighborhood with population of **atleast ten thousand residents**.

Deliverables/Objective

- The new park is for the recreational use, the location of the park should be **atleast 2 miles away** from all **toxic chemical facilities** (Industrial park, oil refineries, and fracking wells).
- The proposed park should not be close to **existing parks** and maintain **atleast half miles** distance from the existing park.
- The community park should be situated in **low-risk air-pollution areas** with size between **30 to 100 acres**.

Data Description

- **Harris_County_Boundary:**
 - Source: Harris County Appraisal District
 - Data Type: Shapefile Feature Class
 - Geometry Type: **Polygon**
 - Geographic Coordinate System (GCS): NAD 1983
 - Projected Coordinate System (PCS): NAD 1983 StatePlane Texas S Central FIPS 4204 (US Feet)
- **Undeveloped_Land_Harris:**
 - Source: Harris County Appraisal District
 - Data Type: Shapefile Feature Class
 - Geometry Type: **Polygon**
 - GCS: NAD 1983
 - PCS: NAD 1983 StatePlane Texas S Central FIPS 4204 (US Feet)
- **Existing_Parks_Harris:**
 - Source: Houston-Galveston Area Council
 - Data Type: Shapefile Feature Class
 - Geometry Type: **Point**
 - GCS: NAD 1983
 - PCS: NAD 1983 StatePlane Texas S Central FIPS 4204 (US Feet)
- **Superfund_npl_Harris (Toxic facilities):**
 - Source: Not Available
 - Data Type: Shapefile Feature Class
 - Geometry Type: **Point**
 - GCS: NAD 1983
 - PCS: Not Defined

Data Description (Continued)

- Population_layer_Harris:

- Source: Not Available
- Data Type: Shapefile Feature Class
- Geometry Type: **Polygon**

- Oil_Refineries_Harris:

- Source: Homeland Infrastructure Foundation-Level (HIFLD) Database
- Data Type: Shapefile Feature Class
- Geometry Type: **Point**
- GCS: WGS 1984
- PCS: Not Defined

- Fracking_wells_Harris

- Source: Texas Railroad Commission
- Data Type: Shapefile Feature Class
- Geometry Type: **Point**
- GCS: WGS 1984
- PCS: WGS 1984 Web Mercator

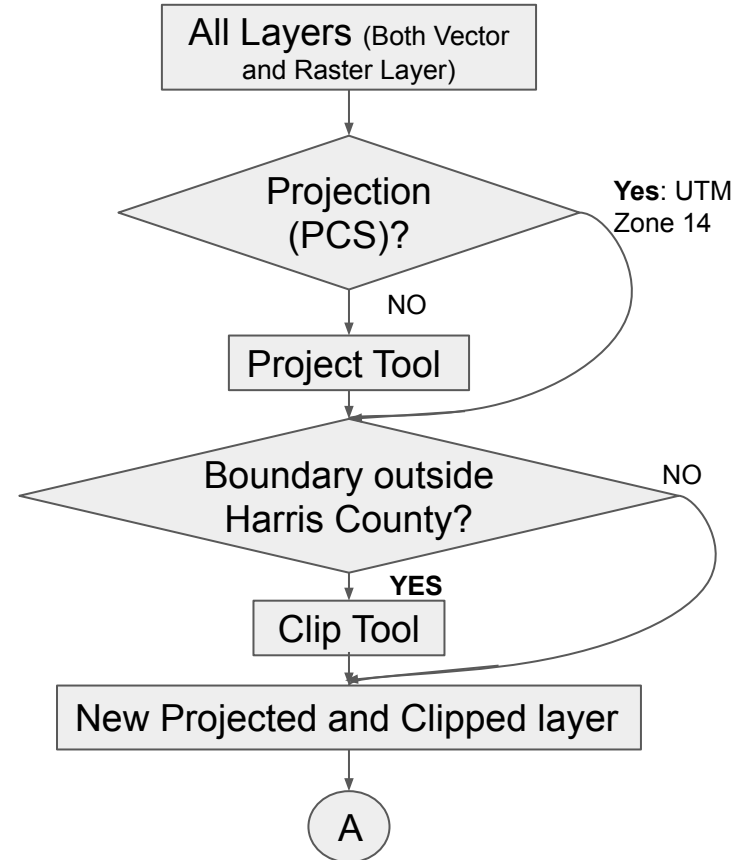
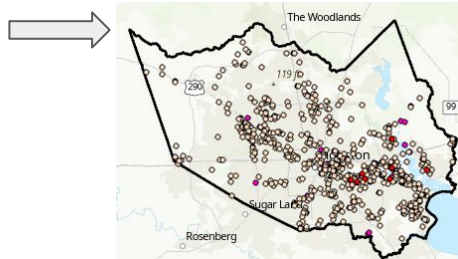
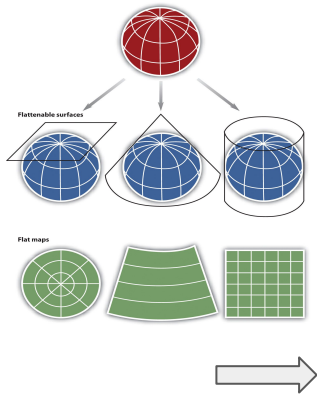
- Facilities_all_Harris

- Source: <https://hub.arcgis.com/>
- Data Type: Feature Service Feature Class
- Geometry Type: **Point**
- GCS: WGS 1984
- PCS: WGS 1984 Web Mercator

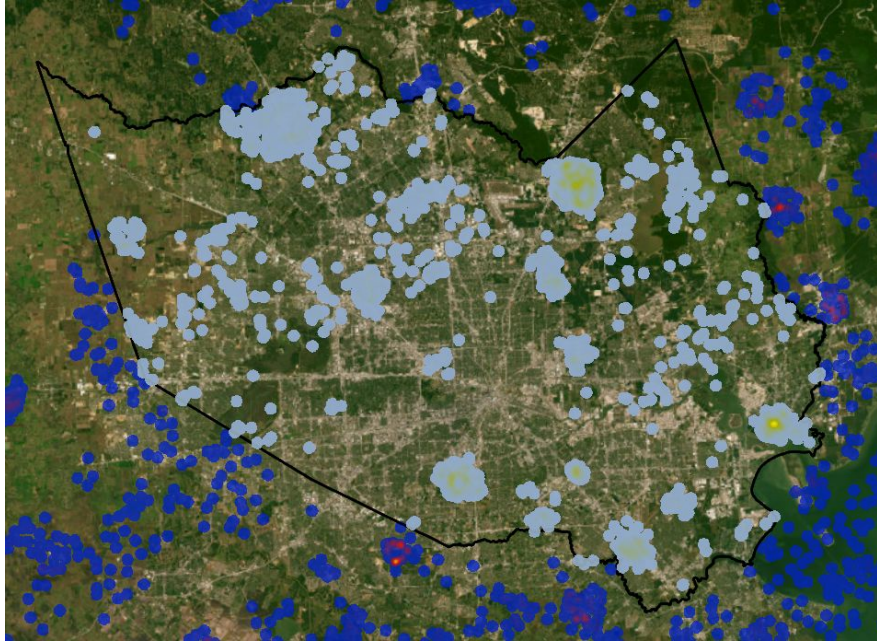
Raster Data Description (Continued)

- PM2_5_Avg_2016_Harris:
 - Source: <https://hub.arcgis.com/>
 - Data Type: **Raster** Feature Class
 - GCS: WGS 1984
 - PCS: NA
 - Average PM2.5 for the year 2016
- EPA_Air_Toxicity_Cancer_Harris
 - Source: Harris County Appraisal District
 - Data Type: **Raster** Feature Class
 - GCS: WGS 1984
 - PCS: NA
- Sentinel_B1_CH4_Harris
 - Source: Esri, European Space Agency - ESA
 - Data Type: **Raster** Feature Class
 - GCS: WGS 1984
 - PCS: NA
 - Methane gas concentration
- Heat_Severity_Unit_Harris
 - Source: Esri, European Space Agency - ESA
 - Data Type: **Raster** Feature Class
 - GCS: WGS 1984
 - PCS: NA

Methodology

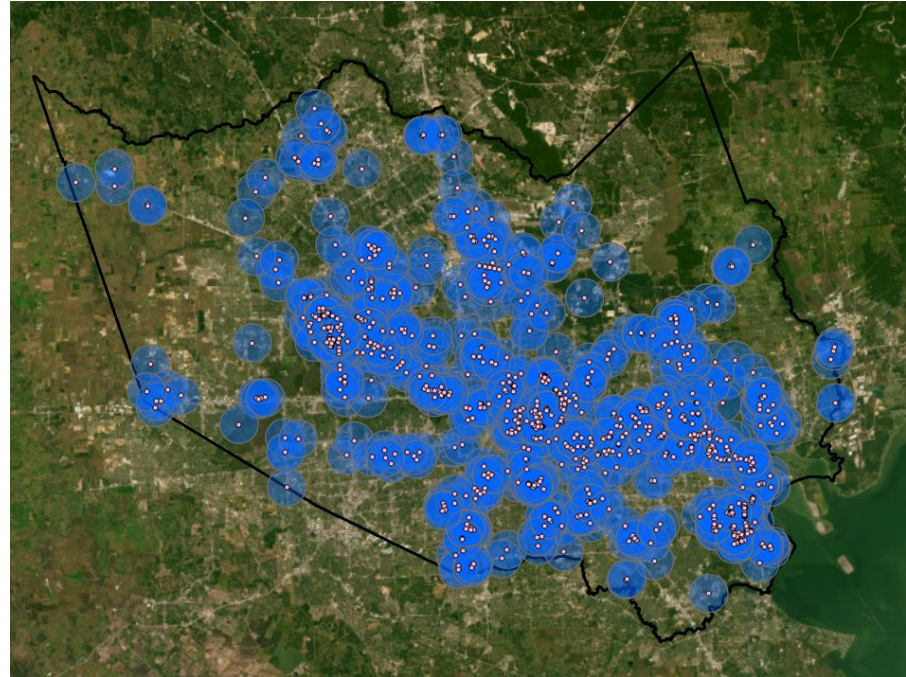


Visualization of Vector Data

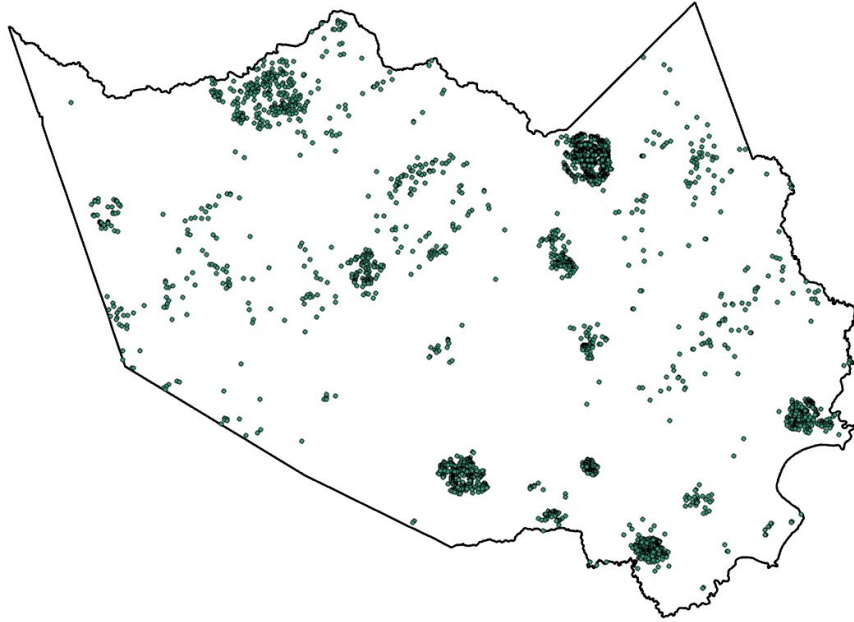


Example of Clip Tool
(Fracking Wells)

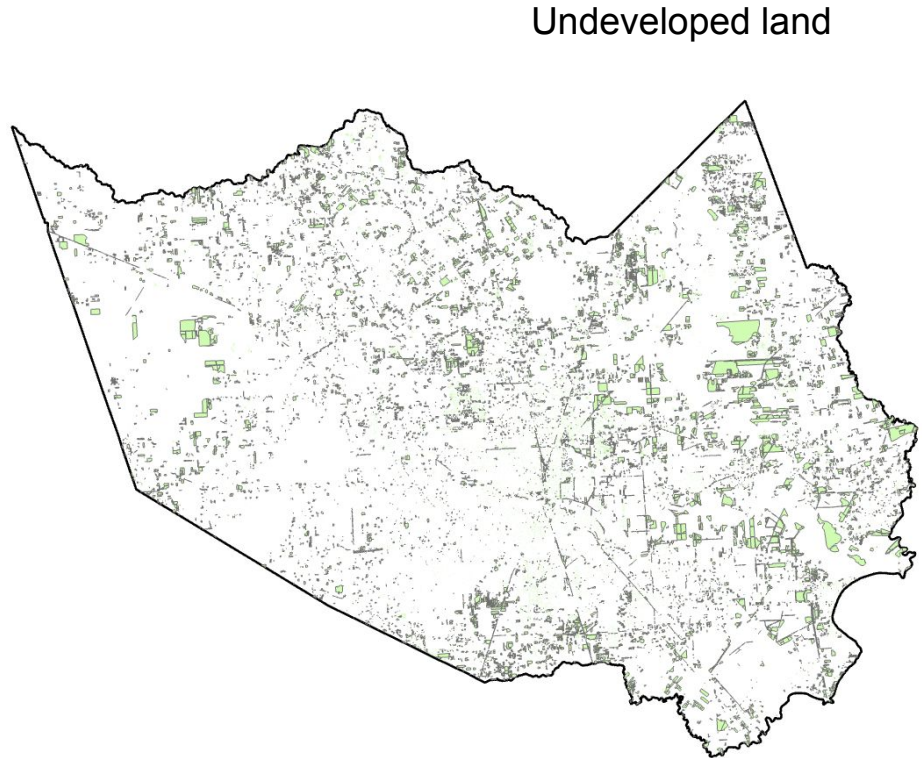
Example of Buffer
(Industrial Area)



Visualization of Vector Data



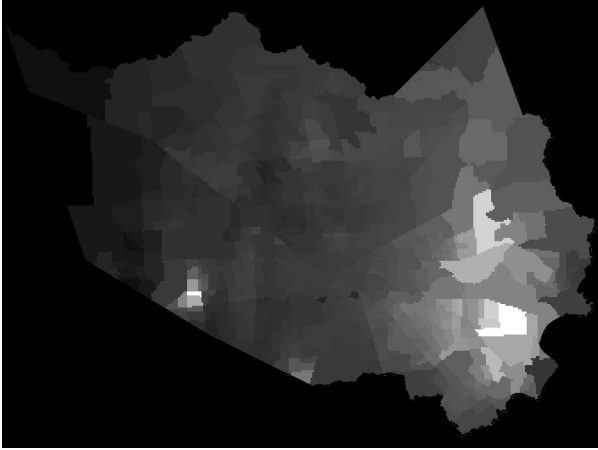
Example of Clip Tool
(Fracking Wells)



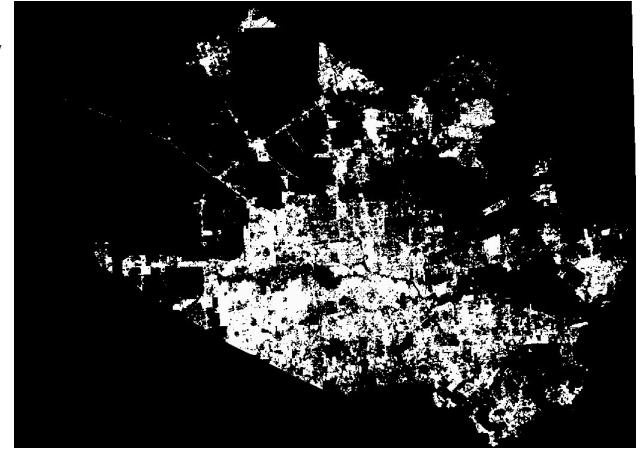
Undeveloped land

Visualization of Raster Data

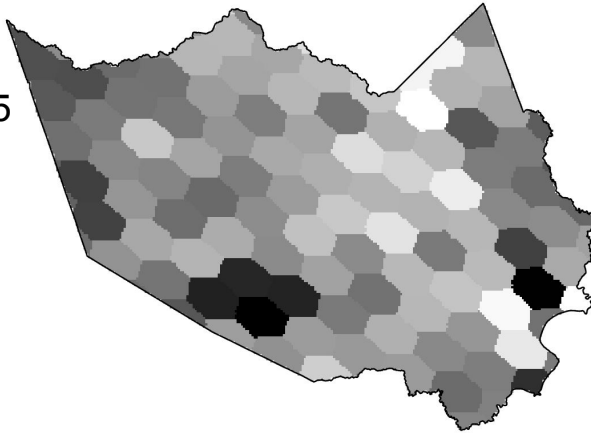
Air Toxicity
Raster Layer



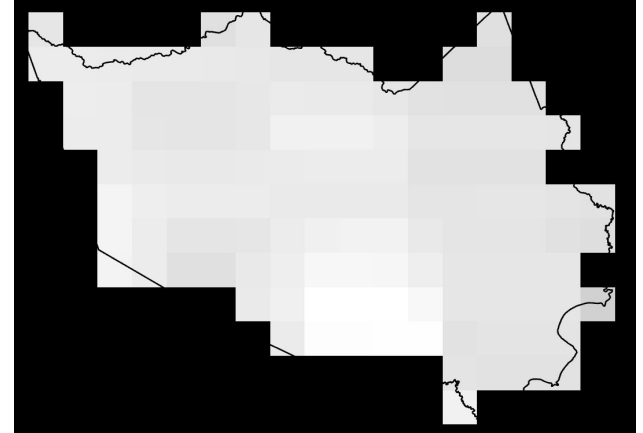
Heat Severity
Raster Layer



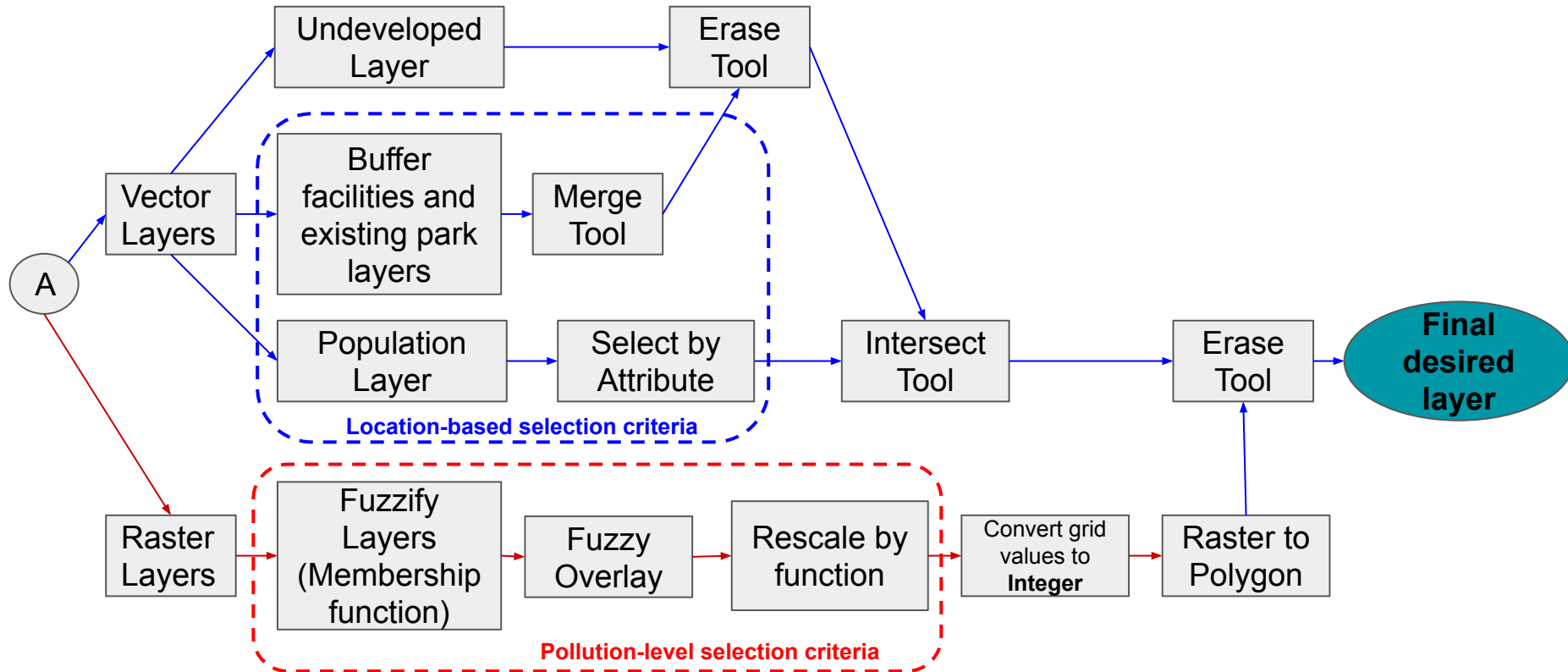
Average PM 2.5
Raster Layer



Satellite CH4
Raster Layer

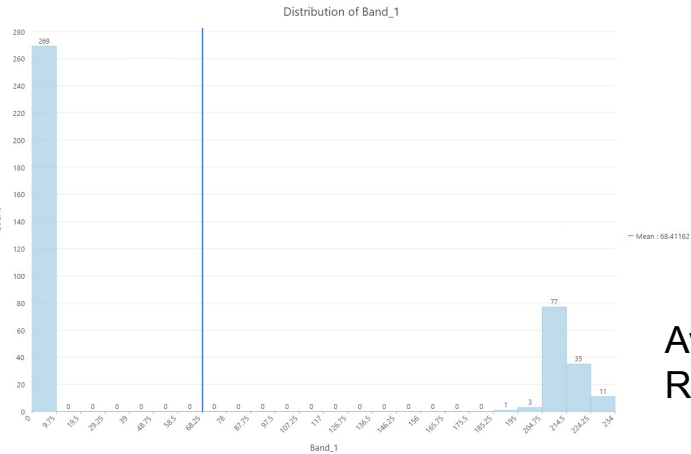
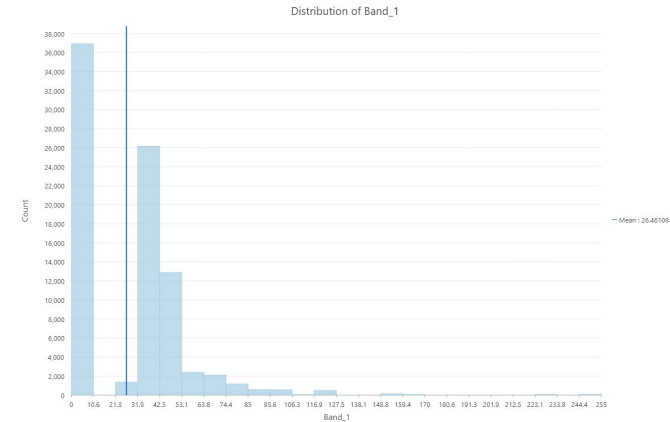


Methodology (Cont'n..)



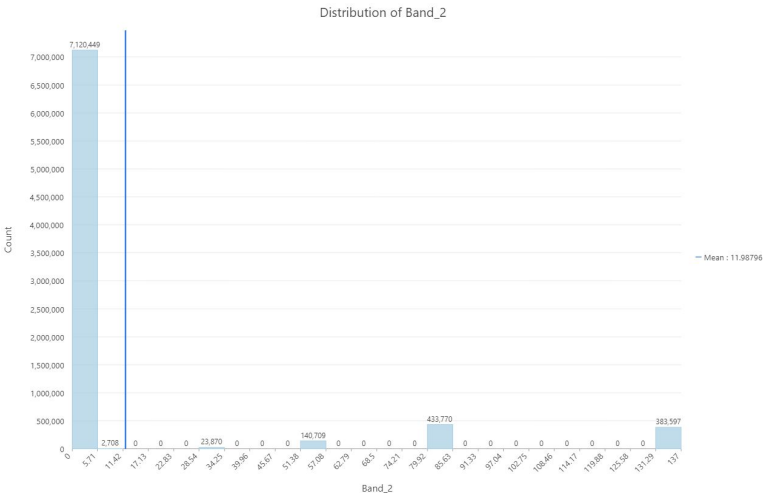
Raster Data Histogram

Air Toxicity Raster Layer

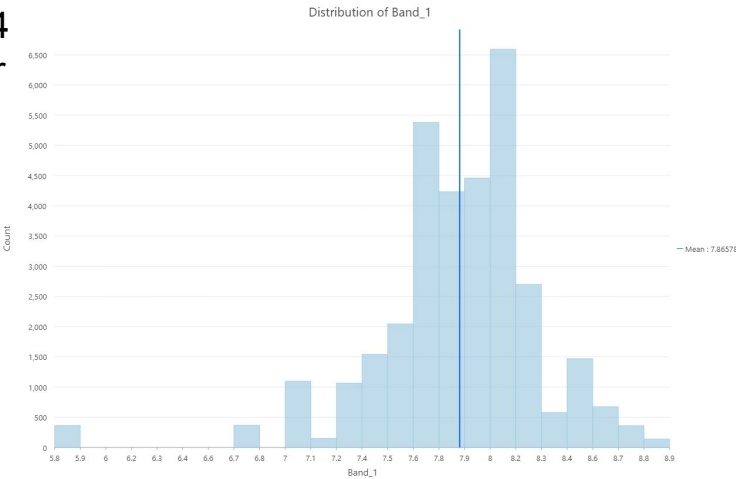


Average PM 2.5 Raster Layer

Heat Severity Raster Layer



Satellite CH4 Raster Layer

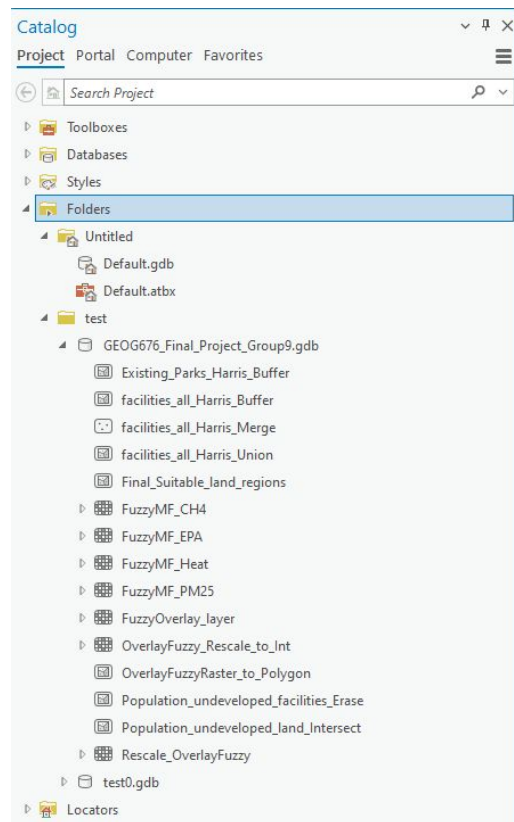
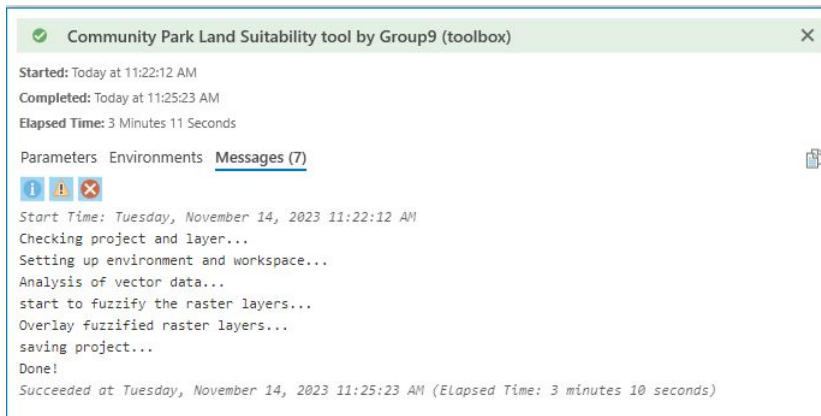
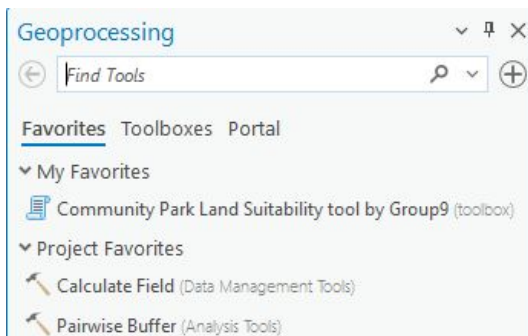


What has been done?

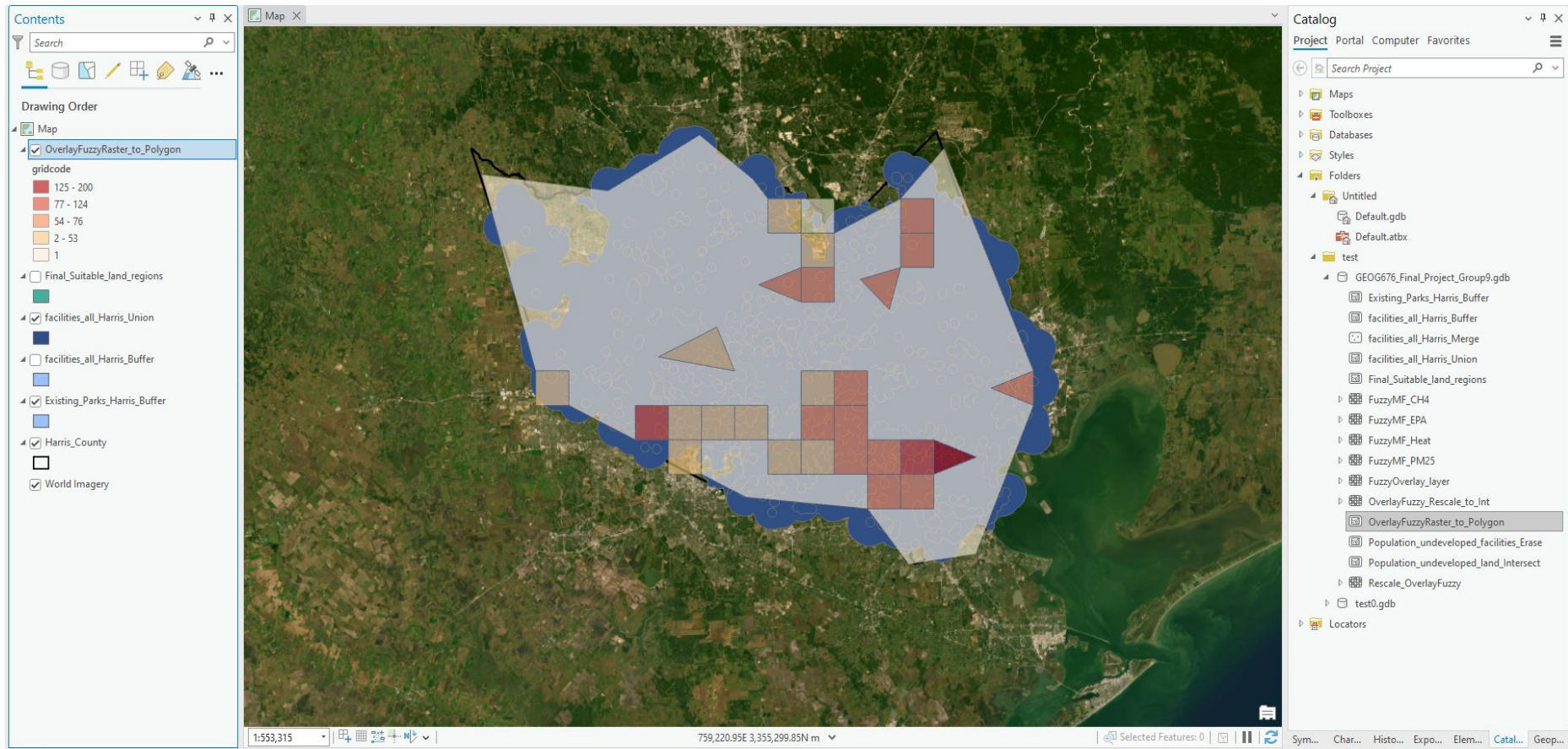
Custom Toolbox

- ArcGIS Pro based **Python Toolbox** used for **programming and analysing** the GIS data for the project.
- **ArcPy, OS,** and **Time** module called as a part of programming.
- Workspace location and overwrite output set.
- Check for necessary license was performed.
- Tool was labelled : Community Park Land Suitability tool by Group9
- Total of 12 parameters were set and called.
- Progressor and Messages were added to python toolbox.

Developed Toolbox Working Demonstration



Results: Industrial zone buffer layer and Fuzzy logic-based Air Pollution Risk layer

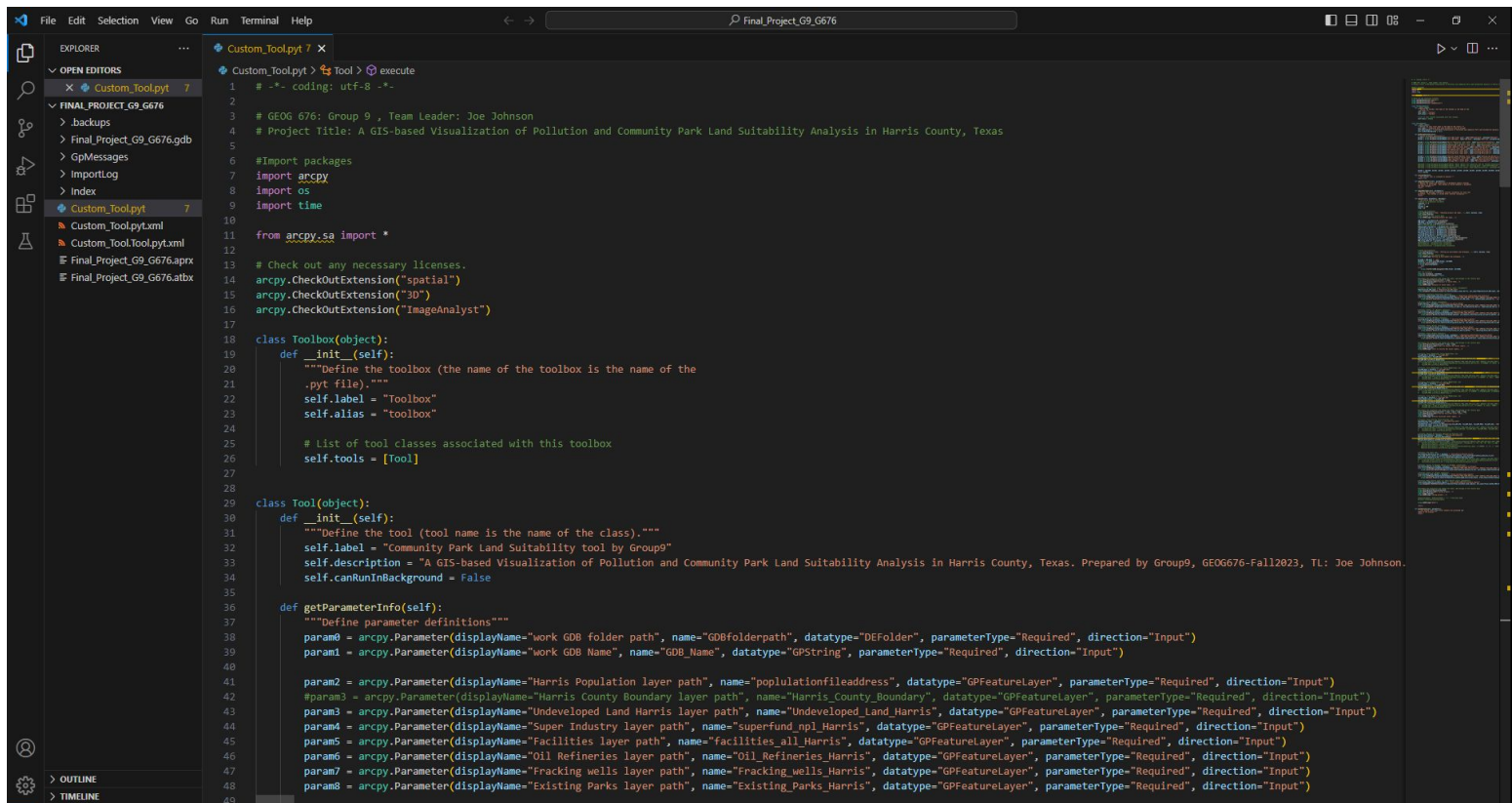


Result: Final Layer Visualization



- Final layer considers all the **predefined conditions** while selecting the region.
- It takes **less than 5 minutes** from loading the required data, processing and to generating the output.
- Every step is **trackable** using progressor and messages.
- Developed python toolbox: **General purpose toolbox** which can be used for any region of the world with similar input dataset.

Python Toolbox code



```
File Edit Selection View Go Run Terminal Help
Custom_Toolbox.py 7 X
Custom_Toolbox.py 7
FINAL_PROJECT_G9_G676
> backups
> Final_Project_G9_G676.gdb
> GpMessages
> ImportLog
> Index
Custom_Toolbox.py 7
Custom_Toolbox.py.xml
Custom_Toolbox.py.xml
Final_Project_G9_G676.aprx
Final_Project_G9_G676.atbx

Custom_Toolbox.py 7 X
1 # -*- coding: utf-8 -*-
2
3 # GEOG 676: Group 9 , Team Leader: Joe Johnson
4 # Project Title: A GIS-based Visualization of Pollution and Community Park Land Suitability Analysis in Harris County, Texas
5
6 # Import packages
7 import arcpy
8 import os
9 import time
10
11 from arcpy.sa import *
12
13 # Check out any necessary licenses.
14 arcpy.CheckOutExtension("spatial")
15 arcpy.CheckOutExtension("3D")
16 arcpy.CheckOutExtension("ImageAnalyst")
17
18 class Toolbox(object):
19     def __init__(self):
20         """Define the toolbox (the name of the toolbox is the name of the
21         .pyt file)."""
22         self.label = "Toolbox"
23         self.alias = "toolbox"
24
25         # List of tool classes associated with this toolbox
26         self.tools = [Tool]
27
28
29 class Tool(object):
30     def __init__(self):
31         """Define the tool (tool name is the name of the class)."""
32         self.label = "Community Park Land Suitability tool by Group9"
33         self.description = "A GIS-based Visualization of Pollution and Community Park Land Suitability Analysis in Harris County, Texas. Prepared by Group9, GEOG676-Fall2023, TL: Joe Johnson."
34         self.canRunInBackground = False
35
36     def getParameterInfo(self):
37         """Define parameter definitions"""
38         param0 = arcpy.Parameter(displayName="work GDB folder path", name="GDBfolderpath", datatype="DEFolder", parameterType="Required", direction="Input")
39         param1 = arcpy.Parameter(displayName="work GDB Name", name="GDB_Name", datatype="GPString", parameterType="Required", direction="Input")
40
41         param2 = arcpy.Parameter(displayName="Harris Population layer path", name="populationfileaddress", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
42         #param3 = arcpy.Parameter(displayName="Harris County Boundary layer path", name="Harris_County_Boundary", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
43         param3 = arcpy.Parameter(displayName="Undeveloped Land Harris layer path", name="Undeveloped_Land_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
44         param4 = arcpy.Parameter(displayName="Super Industry layer path", name="superfund_npl_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
45         param5 = arcpy.Parameter(displayName="Facilities layer path", name="facilities_all_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
46         param6 = arcpy.Parameter(displayName="Oil Refineries layer path", name="Oil_Refineries_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
47         param7 = arcpy.Parameter(displayName="Fracking wells layer path", name="Fracking_wells_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
48         param8 = arcpy.Parameter(displayName="Existing Parks layer path", name="Existing_Parks_Harris", datatype="GPFeatureLayer", parameterType="Required", direction="Input")
```

Python Toolbox code (Cont..)

```

77 def execute(self, parameters, messages):
78     """The source code of the tool."""
79     # Define our progressor variables
80     readtime = 2.5
81     start = 0
82     maximum = 100
83     step = 20
84
85     # Setup the progressor
86     arcpy.SetProgressor("step", "Checking project and layer...", start, maximum, step)
87     time.sleep(readtime)
88     # Add message to the results pane
89     arcpy.AddMessage("Checking project and layer...")
90
91     GDB_Folder = parameters[0].valueAsText
92     GDB_Name = parameters[1].valueAsText
93     popln_layer_Harris = parameters[2].valueAsText
94     hHarris_County_Boundary = parameters[3].valueAsText
95     Undeveloped_Land_Harris = parameters[3].valueAsText
96     superfund_npl_Harris = parameters[4].valueAsText
97     facilities_all_Harris = parameters[5].valueAsText
98     Oil_Refineries_Harris = parameters[6].valueAsText
99     Fracking_wells_Harris = parameters[7].valueAsText
100     Existing_Parks_Harris = parameters[8].valueAsText
101     Sentinel_BI_Clk_Harris.tif = parameters[9].valueAsText
102     EPA_Air-Toxicity_Cancer_Harris.tif = parameters[10].valueAsText
103     Heat_Seracity_Unit_Harris.tif = parameters[11].valueAsText
104     PM2_5_Aug_2016.tif = parameters[12].valueAsText
105     BufferRadius1 = parameters[14].valueAsText
106     BufferRadius2 = parameters[15].valueAsText
107     #populationfilter = parameters[16].valueAsText
108
109
110     # Setup the progressor
111     arcpy.SetProgressor("step", "Setting up environment and workspace...", start, maximum, step)
112     time.sleep(readtime)
113     # Add message to the results pane
114     arcpy.AddMessage("Setting up environment and workspace...")
115
116     WorkGDB = GDB_Name + ".gdb"
117     database = os.path.join(GDB_Folder, WorkGDB)
118     arcpy.env.overwriteOutput = True
119     if arcpy.Exists(database):
120         # delete
121
122     # Find the workspace
123     arcpy.env.workspace = database
124     arcpy.env.overwriteOutput = False
125
126     # Inform the progressor and change the label; add message to the results pane
127     arcpy.SetProgressorLabel("start + step")
128     arcpy.AddMessage("Analysis of vector data...")
129     time.sleep(readtime)
130     arcpy.AddMessage("Analysis of vector data...")
131
132     # Process: Make Feature Layer (Make Feature Layer (management))
133     arcpy.MakeFeatureLayer_management("Population_of_3M_Layer", "Population_of_3M_Layer")
134
135     # Process: Intersect (Intersect) (analysis)
136     Population_undeveloped_Land_Intersect = database + "Population_undeveloped_Land_Intersect"
137     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
138     arcpy.analysis.intersect(in_features=[Population_of_3M_Layer, "Undeveloped_Land_Harris"], out_feature_class=Population_undeveloped_Land_Intersect)
139
140     # Process: Merge (Merge) (management)
141     Output_Dataset = database + "Facilities_all_Harris_Merge"
142     arcpy.MakeFeatureLayer_management("Facilities_all_Harris_Merge", "Facilities_all_Harris_Merge")
143     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
144     arcpy.management.merge(input_datasets=[Facilities_all_Harris, Oil_Refineries_Harris, superfund_npl_Harris, Fracking_wells_Harris], output=output_Dataset, field_mappings=[{"FROM": "TOWN",
145     arcpy.management.merge(input_datasets=[Facilities_all_Harris, Oil_Refineries_Harris, superfund_npl_Harris, Fracking_wells_Harris], output=output_Dataset, field_mappings=[{"FROM": "TOWN",
146
147     # Process: Buffer (Buffer) (analysis)
148     Facilities_all_Harris_Buffer = database + "Facilities_all_Harris_Buffer"
149     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
150     arcpy.analysis.buffer(input_features=output_Dataset, out_feature_class=Facilities_all_Harris_Buffer, buffer_distance_or_field="2 miles", dissolve_option="ALL")
151
152     # Process: Buffer (Buffer) (analysis)
153     Existing_Parks_Harris_Buffer = database + "Existing_Parks_Harris_Buffer"
154     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
155     arcpy.analysis.buffer(input_features=Existing_Parks_Harris, out_feature_class=Existing_Parks_Harris_Buffer, buffer_distance_or_field="0.5 miles", dissolve_option="ALL")
156
157     # Process: Join (Join) (management)
158     Facilities_all_Harris_Merge_in = database + "Facilities_all_Harris_Merge"
159     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
160     arcpy.analysis.join(input_datasets=[Facilities_all_Harris_Buffer, "Existing_Parks_Harris_Buffer"], out_feature_class=Facilities_all_Harris_Merge, append_to_existing=True)
161
162     # Process: Append (Append) (management)
163     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
164     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
165     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
166
167     # Process: Append (Append) (management)
168     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
169     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
170     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
171
172     # Process: Append (Append) (management)
173     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
174     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
175     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
176
177     # Process: Append (Append) (management)
178     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
179     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
180     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
181
182     # Process: Append (Append) (management)
183     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
184     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
185     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
186
187     # Process: Append (Append) (management)
188     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
189     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
190     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
191
192     # Process: Append (Append) (management)
193     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
194     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
195     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
196
197     # Process: Append (Append) (management)
198     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
199     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
200     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
201
202     # Process: Append (Append) (management)
203     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
204     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
205     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
206
207     # Process: Append (Append) (management)
208     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
209     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
210     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
211
212     # Process: Append (Append) (management)
213     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
214     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
215     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
216
217     # Process: Append (Append) (management)
218     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
219     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
220     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
221
222     # Process: Append (Append) (management)
223     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
224     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
225     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
226
227     # Process: Append (Append) (management)
228     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
229     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
230     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
231
232     # Process: Append (Append) (management)
233     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
234     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
235     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
236
237     # Process: Append (Append) (management)
238     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
239     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\MS_1804\\", DATUM="WGS 1984", SPHEROID="WGS 1984",
240     arcpy.management.append(input_datasets=[Population_undeveloped_Land_Intersect, Facilities_all_Harris_Merge], out_feature_class=Population_undeveloped_Facilities_Feature, append_to_existing=True)
241
242     # Process: Append (Append) (management)
243     Population_undeveloped_Facilities_Feature = database + "Population_undeveloped_Facilities_Feature"
244     with arcpy.EnvManager(outputCoordinateSystem="WGS84", workspace="\\MS03\\
```

```

160 #Increment the progress bar and change the label, and message to the results pane
161 arcpy.SetProgressorPosition(start + step + step)
162 arcpy.AddMessage(olabel_start + "start to fuzzy the raster layers...")
163 time.sleep(readline)
164 arcpy.AddMessage(olabel_start + "start to fuzzy the raster layers...")
165
166 # Process: Fuzzy Membership (Fuzzy Membership) (s4)
167 fuzzymp_1pa = database + "fuzzymp_1pa"
168 fuzzy_membership = FuzzyMP_1PA
169 fuzzymp_1pa = arcpy.sa.FuzzyMembership(IPA_Air_Toxicity.Cancer_Harris.tif, fuzzylinearc(0, 255))
170 fuzzymp_1pa.save(fuzzy_membership)
171 # Process: Fuzzy Membership (Fuzzy Membership) (s5)
172 fuzzymp_2pa = database + "fuzzymp_2pa"
173 fuzzy_membership_2 = FuzzyMP_2PA
174 fuzzymp_2pa = arcpy.sa.FuzzyMembership(IPA_Air_Toxicity.Cancer_Harris.tif, [[fuzzylinearc(0, 255)], "NONE"])
175 fuzzymp_2pa.save(fuzzy_membership)
176 # Process: Fuzzy Membership (Fuzzy Membership) (s6)
177 fuzzymp_3pa = database + "fuzzymp_3pa"
178 fuzzy_membership_3 = FuzzyMP_3PA
179 fuzzymp_3pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
180 fuzzymp_3pa.save(fuzzy_membership_3)
181 # Process: Fuzzy Membership (Fuzzy Membership) (s7)
182 fuzzymp_4pa = database + "fuzzymp_4pa"
183 fuzzy_membership_4 = FuzzyMP_4PA
184 fuzzymp_4pa = arcpy.sa.FuzzyMembership(Intervl_B1_OH_Harris.tif, fuzzylinearc(0, 234))
185 fuzzymp_4pa.save(fuzzy_membership_4)
186 # Process: Fuzzy Membership (Fuzzy Membership) (s8)
187 fuzzymp_5pa = database + "fuzzymp_5pa"
188 fuzzy_membership_5 = FuzzyMP_5PA
189 fuzzymp_5pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
190 fuzzymp_5pa.save(fuzzy_membership_5)
191 # Process: Fuzzy Membership (Fuzzy Membership) (s9)
192 fuzzymp_6pa = database + "fuzzymp_6pa"
193 fuzzy_membership_6 = FuzzyMP_6PA
194 fuzzymp_6pa = arcpy.sa.FuzzyMembership(Intervl_B1_OH_Harris.tif, [[fuzzylinearc(0, 234)], "NONE"])
195 fuzzymp_6pa.save(fuzzy_membership_6)
196 # Process: Fuzzy Membership (Fuzzy Membership) (s10)
197 fuzzymp_7pa = database + "fuzzymp_7pa"
198 fuzzy_membership_7 = FuzzyMP_7PA
199 fuzzymp_7pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
200 fuzzymp_7pa.save(fuzzy_membership_7)
201 # Process: Fuzzy Membership (Fuzzy Membership) (s11)
202 fuzzymp_8pa = database + "fuzzymp_8pa"
203 fuzzy_membership_8 = FuzzyMP_8PA
204 fuzzymp_8pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
205 fuzzymp_8pa.save(fuzzy_membership_8)
206 # Process: Fuzzy Membership (Fuzzy Membership) (s12)
207 fuzzymp_9pa = database + "fuzzymp_9pa"
208 fuzzy_membership_9 = FuzzyMP_9PA
209 fuzzymp_9pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
210 fuzzymp_9pa.save(fuzzy_membership_9)
211 # Process: Fuzzy Membership (Fuzzy Membership) (s13)
212 fuzzymp_10pa = database + "fuzzymp_10pa"
213 fuzzy_membership_10 = FuzzyMP_10PA
214 fuzzymp_10pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
215 fuzzymp_10pa.save(fuzzy_membership_10)
216 # Process: Fuzzy Membership (Fuzzy Membership) (s14)
217 fuzzymp_11pa = database + "fuzzymp_11pa"
218 fuzzy_membership_11 = FuzzyMP_11PA
219 fuzzymp_11pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
220 fuzzymp_11pa.save(fuzzy_membership_11)
221 # Process: Fuzzy Membership (Fuzzy Membership) (s15)
222 fuzzymp_12pa = database + "fuzzymp_12pa"
223 fuzzy_membership_12 = FuzzyMP_12PA
224 fuzzymp_12pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
225 fuzzymp_12pa.save(fuzzy_membership_12)
226 # Process: Fuzzy Membership (Fuzzy Membership) (s16)
227 fuzzymp_13pa = database + "fuzzymp_13pa"
228 fuzzy_membership_13 = FuzzyMP_13PA
229 fuzzymp_13pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
230 fuzzymp_13pa.save(fuzzy_membership_13)
231 # Process: Fuzzy Membership (Fuzzy Membership) (s17)
232 fuzzymp_14pa = database + "fuzzymp_14pa"
233 fuzzy_membership_14 = FuzzyMP_14PA
234 fuzzymp_14pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
235 fuzzymp_14pa.save(fuzzy_membership_14)
236 # Process: Fuzzy Membership (Fuzzy Membership) (s18)
237 fuzzymp_15pa = database + "fuzzymp_15pa"
238 fuzzy_membership_15 = FuzzyMP_15PA
239 fuzzymp_15pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
240 fuzzymp_15pa.save(fuzzy_membership_15)
241 # Process: Fuzzy Membership (Fuzzy Membership) (s19)
242 fuzzymp_16pa = database + "fuzzymp_16pa"
243 fuzzy_membership_16 = FuzzyMP_16PA
244 fuzzymp_16pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
245 fuzzymp_16pa.save(fuzzy_membership_16)
246 # Process: Fuzzy Membership (Fuzzy Membership) (s20)
247 fuzzymp_17pa = database + "fuzzymp_17pa"
248 fuzzy_membership_17 = FuzzyMP_17PA
249 fuzzymp_17pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
250 fuzzymp_17pa.save(fuzzy_membership_17)
251 # Process: Fuzzy Membership (Fuzzy Membership) (s21)
252 fuzzymp_18pa = database + "fuzzymp_18pa"
253 fuzzy_membership_18 = FuzzyMP_18PA
254 fuzzymp_18pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
255 fuzzymp_18pa.save(fuzzy_membership_18)
256 # Process: Fuzzy Membership (Fuzzy Membership) (s22)
257 fuzzymp_19pa = database + "fuzzymp_19pa"
258 fuzzy_membership_19 = FuzzyMP_19PA
259 fuzzymp_19pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
260 fuzzymp_19pa.save(fuzzy_membership_19)
261 # Process: Fuzzy Membership (Fuzzy Membership) (s23)
262 fuzzymp_20pa = database + "fuzzymp_20pa"
263 fuzzy_membership_20 = FuzzyMP_20PA
264 fuzzymp_20pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
265 fuzzymp_20pa.save(fuzzy_membership_20)
266 # Process: Fuzzy Membership (Fuzzy Membership) (s24)
267 fuzzymp_21pa = database + "fuzzymp_21pa"
268 fuzzy_membership_21 = FuzzyMP_21PA
269 fuzzymp_21pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
270 fuzzymp_21pa.save(fuzzy_membership_21)
271 # Process: Fuzzy Membership (Fuzzy Membership) (s25)
272 fuzzymp_22pa = database + "fuzzymp_22pa"
273 fuzzy_membership_22 = FuzzyMP_22PA
274 fuzzymp_22pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
275 fuzzymp_22pa.save(fuzzy_membership_22)
276 # Process: Fuzzy Membership (Fuzzy Membership) (s26)
277 fuzzymp_23pa = database + "fuzzymp_23pa"
278 fuzzy_membership_23 = FuzzyMP_23PA
279 fuzzymp_23pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
280 fuzzymp_23pa.save(fuzzy_membership_23)
281 # Process: Fuzzy Membership (Fuzzy Membership) (s27)
282 fuzzymp_24pa = database + "fuzzymp_24pa"
283 fuzzy_membership_24 = FuzzyMP_24PA
284 fuzzymp_24pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
285 fuzzymp_24pa.save(fuzzy_membership_24)
286 # Process: Fuzzy Membership (Fuzzy Membership) (s28)
287 fuzzymp_25pa = database + "fuzzymp_25pa"
288 fuzzy_membership_25 = FuzzyMP_25PA
289 fuzzymp_25pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
290 fuzzymp_25pa.save(fuzzy_membership_25)
291 # Process: Fuzzy Membership (Fuzzy Membership) (s29)
292 fuzzymp_26pa = database + "fuzzymp_26pa"
293 fuzzy_membership_26 = FuzzyMP_26PA
294 fuzzymp_26pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
295 fuzzymp_26pa.save(fuzzy_membership_26)
296 # Process: Fuzzy Membership (Fuzzy Membership) (s30)
297 fuzzymp_27pa = database + "fuzzymp_27pa"
298 fuzzy_membership_27 = FuzzyMP_27PA
299 fuzzymp_27pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
300 fuzzymp_27pa.save(fuzzy_membership_27)
301 # Process: Fuzzy Membership (Fuzzy Membership) (s31)
302 fuzzymp_28pa = database + "fuzzymp_28pa"
303 fuzzy_membership_28 = FuzzyMP_28PA
304 fuzzymp_28pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
305 fuzzymp_28pa.save(fuzzy_membership_28)
306 # Process: Fuzzy Membership (Fuzzy Membership) (s32)
307 fuzzymp_29pa = database + "fuzzymp_29pa"
308 fuzzy_membership_29 = FuzzyMP_29PA
309 fuzzymp_29pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
310 fuzzymp_29pa.save(fuzzy_membership_29)
311 # Process: Fuzzy Membership (Fuzzy Membership) (s33)
312 fuzzymp_30pa = database + "fuzzymp_30pa"
313 fuzzy_membership_30 = FuzzyMP_30PA
314 fuzzymp_30pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
315 fuzzymp_30pa.save(fuzzy_membership_30)
316 # Process: Fuzzy Membership (Fuzzy Membership) (s34)
317 fuzzymp_31pa = database + "fuzzymp_31pa"
318 fuzzy_membership_31 = FuzzyMP_31PA
319 fuzzymp_31pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
320 fuzzymp_31pa.save(fuzzy_membership_31)
321 # Process: Fuzzy Membership (Fuzzy Membership) (s35)
322 fuzzymp_32pa = database + "fuzzymp_32pa"
323 fuzzy_membership_32 = FuzzyMP_32PA
324 fuzzymp_32pa = arcpy.sa.FuzzyMembership(IPM2_5_Aug_2005.tif, fuzzylinearc(0, 9.948644207764))
325 fuzzymp_32pa.save
```

A GIS-based Visualization of Pollution and Community Park Land Suitability Analysis in Harris County, Texas



Questions?