Location-Based Analysis for Recruitment of United States Border Patrol Agents

Jordan Douthitt

Advisor: Stephen A. Matthews

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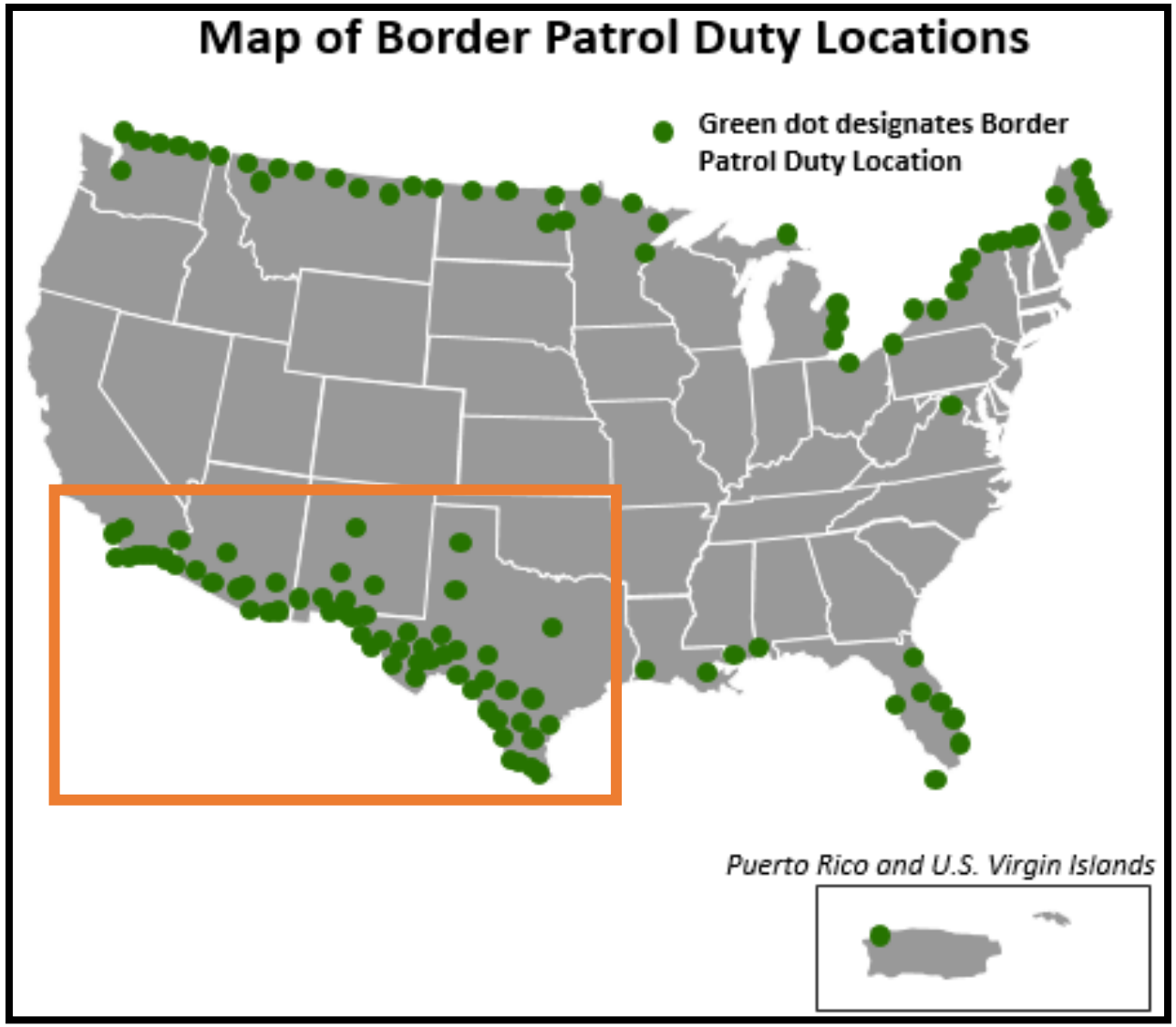
Background Information

Executive Order 13767 on January 25th, 2017

- Need to hire 5,000 additional U.S. Border Patrol Agents

Historical difficulty hiring Agents

>10% loss in Southwest Agents 2011-2017



Problem

Need to strategically recruit a large amount of skilled employees (United States Border Patrol Agents) to hard to fill positions in undesirable locations.

Goal

Analysis answering two questions

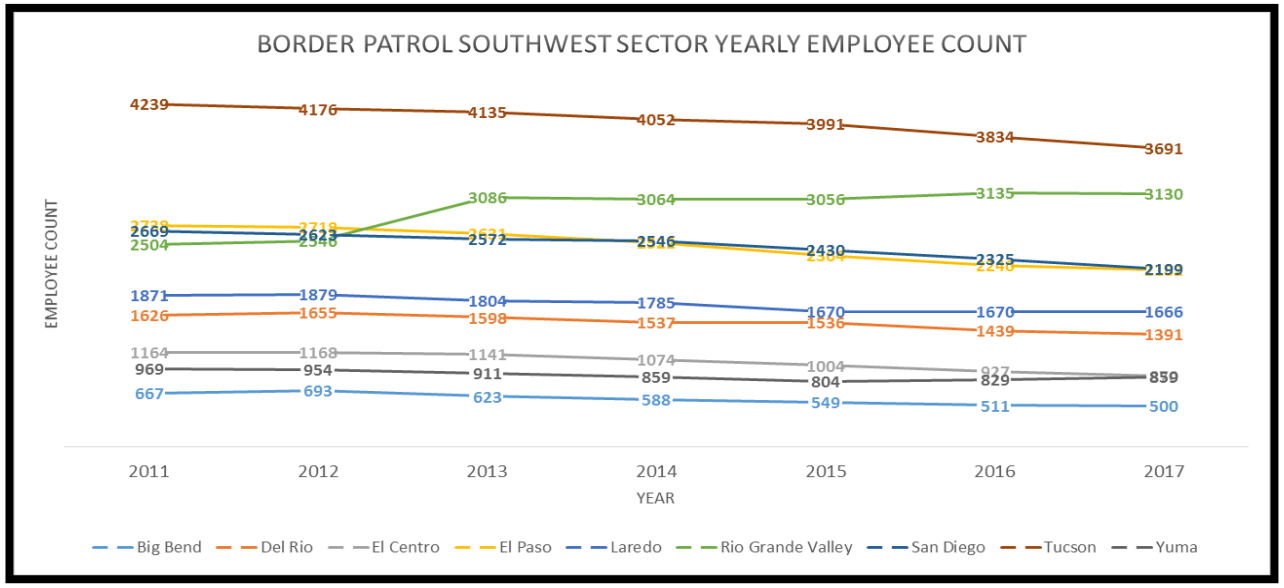
1. Which Border Patrol Sectors have the greatest recruitment support need?

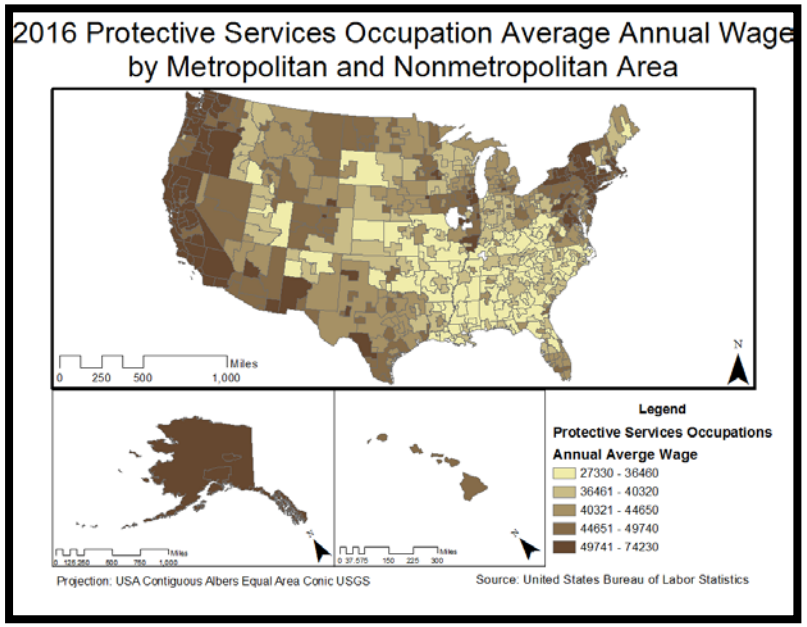
2. Which areas outside of these Border Patrol Sectors can additional recruiting focus on?

Factors Affecting Recruitment

Border Patrol Agent Factors

- Starting age under 39
- Degree/Background in Law Enforcement
- Ability to Speak/Learn Spanish
- Workload & Location





Labor Pool & Migration Factors

- Total Population
- Age
- Unemployment Rate
- Salary
- Community Size & Demography
- Distance from Community of Origin
- Previous Migration/Social Ties

Methodology: Sector Profiles

Sector Information
- Agent Count
- Agent Turnover
- Station Count

Workload
- Border crossing locations
- Apprehensions per agent
- Border entries per agent

Labor Pool
- Percent of stations in nonmetropolitan areas
- Population of labor pools

DECISION:

Which sectors are most in need of additional recruitment assistance

Methodology: Labor Pool Analysis

Sensitivity Testing
- R^2 correlation between factor values

Measure Factors
- 1-5 quantile rating
- Final Score: sum of individual ratings

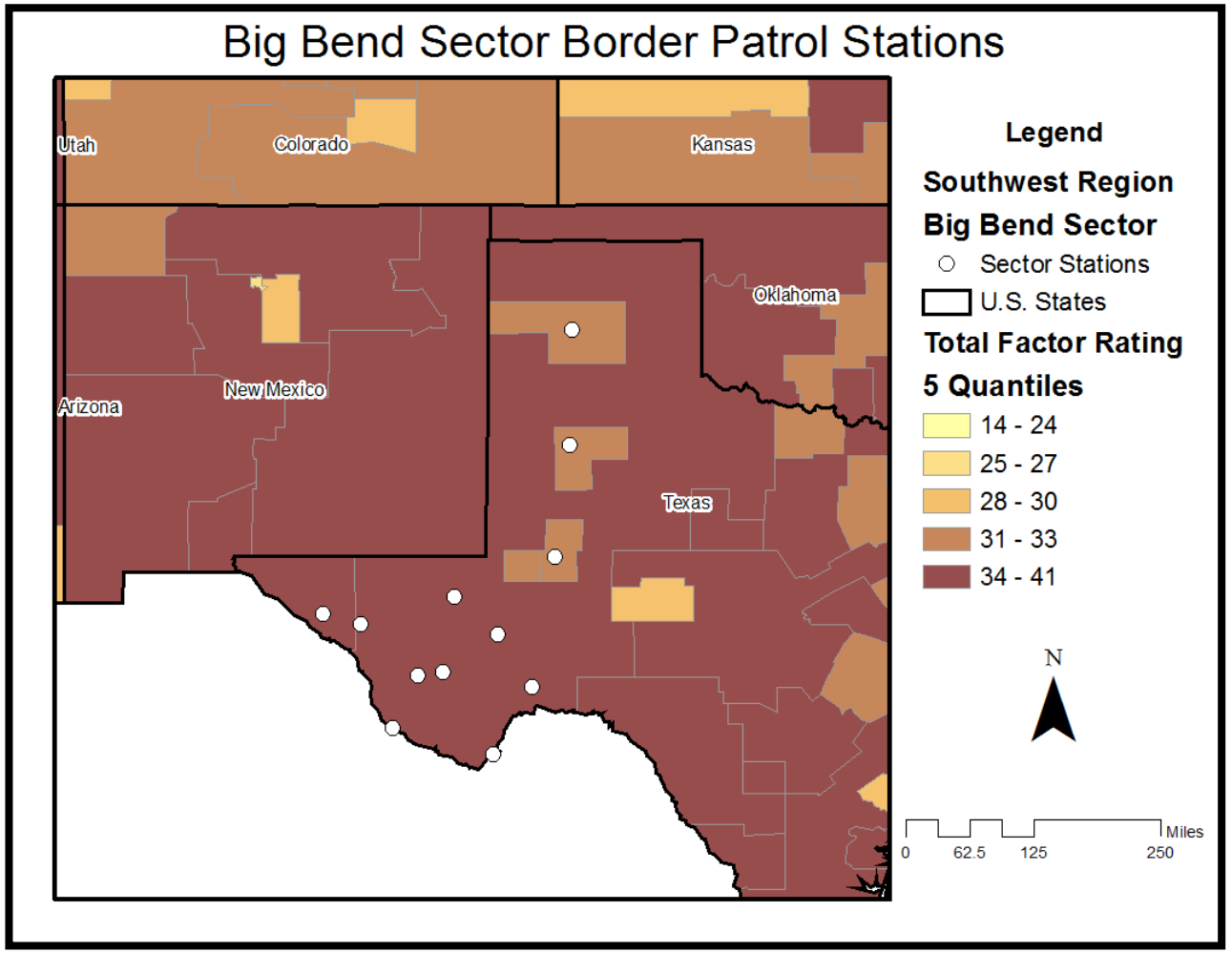
Results Testing
- R^2 correlation between factor scores
- & total score

Spatial Cluster Analysis
- Univariate Local Moran's I
- Getis-Ord Gi*

DECISION:

Which outside labor pools are most likely to provide more viable recruits

Results: Sector Profiles



Sector Information

- 2017 Agent Count: 500
- 2011-2017 Agent Change: 25% loss
- Station Count: 13

Workload

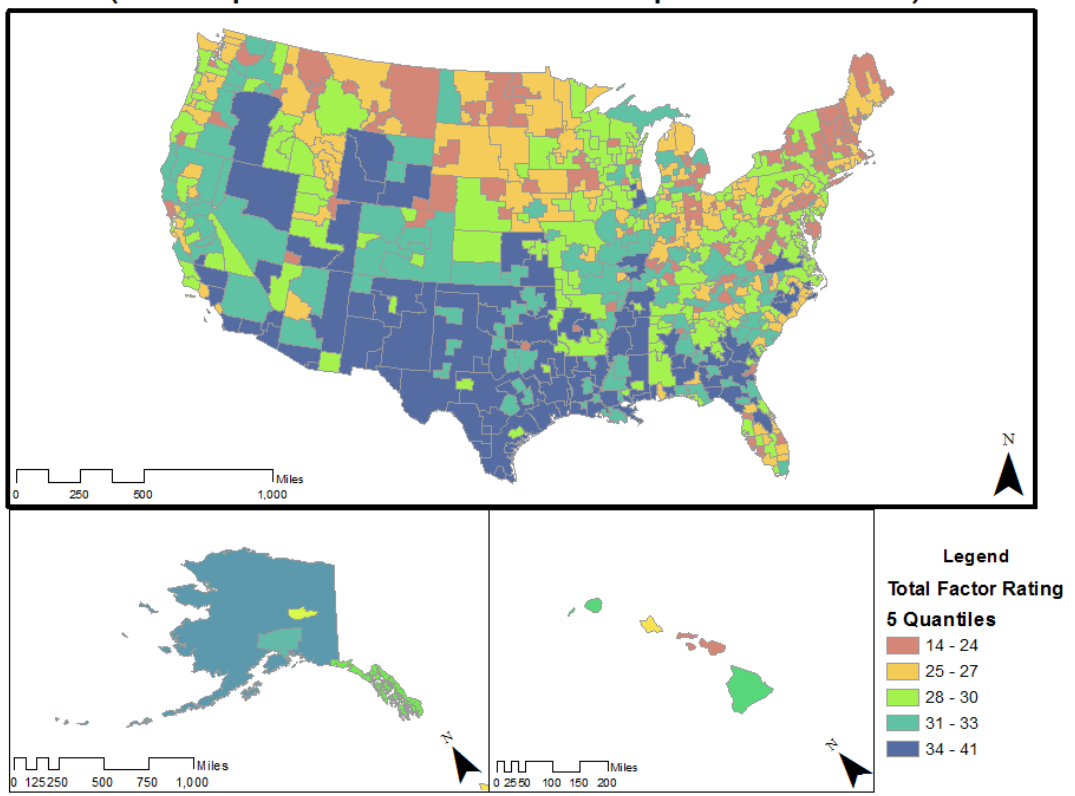
- Border Crossing Count: 2
- Apprehensions per Agent: 12
- Border Entries per Agent: 2,990

Labor Pool

- Percent of Stations in Nonmetropolitan Areas: 69.2%
- Population of Surrounding Labor Pools: 2,142,736

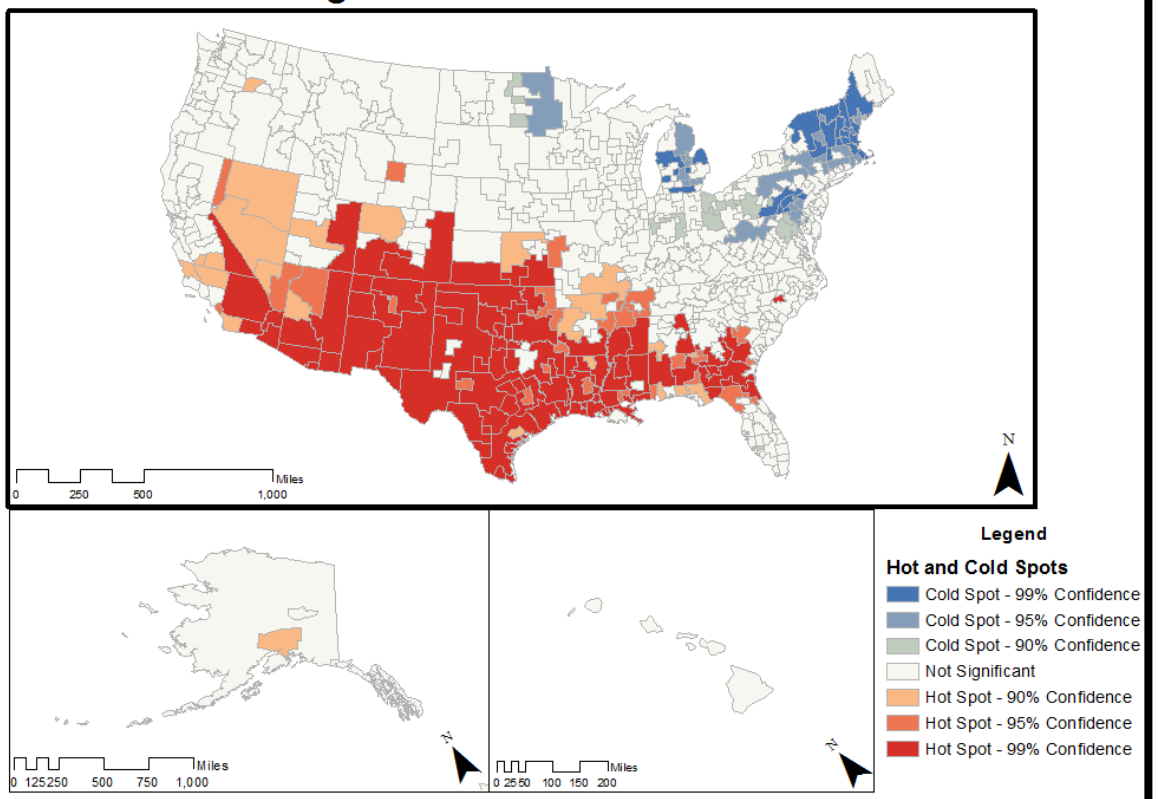
Results: Labor Pool Analysis

Total Rating of Potential Border Patrol Labor Pools
(Metropolitan and Nonmetropolitan Areas)



Projection: USA Contiguous Albers Equal Area Conic USGS

Border Patrol Potential Labor Pool Hot and Cold Clusters
Using Getis-Ord Gi* Statistic



Projection: USA Contiguous Albers Equal Area Conic USGS

Conclusions

Value to Human Resources Field:

- Previously minimal demographic or location-based research performed
- Model for focused recruitment of hard to fill positions that can be used in other similar scenarios

ArcPy

Need:

- Join a large amount of Census CSV files to a feature class to visualize factors within
- Tell which areas are within a desired distance of the border between the United States and Mexico
- Easily allow for changes needed as data is researched

Python:

- Automate Repetitive Tasks
- Changeable Parameters
- Ease of Use with ArcGIS Script Tool
- Sharable

ArcPy

```
#Import both arcpy and csv modules for use in script
import arcpy
import csv
import os

#Set overwriteOutput to true, so that files can be overwritten if an error happens
arcpy.env.overwriteOutput = True

#Set needed input and output parameters
inputTablesFolder = arcpy.GetParameterAsText(0)
inputJoinShapefile = arcpy.GetParameterAsText(1)
inputBufferShapefile = arcpy.GetParameterAsText(2)
inputBufferDistance = arcpy.GetParameterAsText(3)
outputFolder = arcpy.GetParameterAsText(4)

#Start try statement for bulk of script
try:

    #Check if this geodatabase already exists in the output folder
    #Create name and location to check for geodatabase
    outputGDBCheck = os.path.join(outputFolder,"Output_GDB.gdb")
    #Start if statement, if geodatabase exists, set ouput geodatabase path
    if arcpy.Exists(outputGDBCheck):
        arcpy.AddMessage("FileGDB Already Exists")
        outputGDB = outputGDBCheck
    #If the output file geodatabase does not already exist in the output folder, create it
    else:
        #Create file geodatabase to output new shapefiles into
        outputGDB = arcpy.CreateFileGDB_management(outputFolder, "Output_GDB")
```

Import Modules

Input Parameters (script tool)

Check for / Create Geodatabase

ArcPy

```
#Sets workspace for the arcpy.ListFiles() function
arcpy.env.workspace = inputTablesFolder
#Lists all files from input folder that end in ".csv"
csvList = arcpy.ListFiles("*.csv")

#Start for loop for csv files
for table in csvList:

    #Create output feature layer name from csv name
    fcName = table.replace(".csv", "")

    #Make layer from input shapefile to allow for select layer by location later in script
    arcpy.MakeFeatureLayer_management(inputJoinShapefile,fcName)

    #Create buffer distance name
    #This removes all spaces from the buffer distance string
    fieldNameString = inputBufferDistance.replace(" ","_")
    #Length of field name is kept to 10 characters with 'bf_' and the first 7 characters of the buffer distance
    fieldName = "bf_" + fieldNameString[:6]
    #Adds field
    arcpy.AddField_management(fcName, fieldName, "TEXT")


    #Select layer by location based on input buffer shapefile and distance
    arcpy.SelectLayerByLocation_management(fcName,"WITHIN_A_DISTANCE",inputBufferShapefile, inputBufferDistance)

    #Update cursor to add whether or not each record falls in the specified distance of the selected feature
    #If record falls within buffer distance (select by location), it prints "YES" in the field, otherwise a null value is left
    with arcpy.da.UpdateCursor(fcName, (fieldName,)) as cursor:
        for row in cursor:
            row[0] = "YES"
            cursor.updateRow(row)
```

Create New Field

Select by Buffer Distance

Update Field Values

ArcPy

```
        #Clear selected features before join to csv, so that all features are joined, not just selected features
        arcpy.SelectLayerByAttribute_management(fcName,"CLEAR_SELECTION")

        #Join csv to new feature layer based on the GEOID2 field in each
        arcpy.AddJoin_management(fcName, "GEOID2", table, "GEOID2")

        #Create shapefile from layer and joined table
        #Set name of output shapefile
        lyrName = fcName
        lyrName2 = lyrName + "_fc"
        #Create path for output shapefile
        outPath = str(outputGDB)
        fcPath = os.path.join(outPath,lyrName2)
        #Create shapefile
        arcpy.CopyFeatures_management(lyrName, fcPath)

        arcpy.AddMessage(arcpy.GetMessages())

#Get error messages if script doesn't work
except:
    #Report error message
    arcpy.AddMessage("Could Not Complete Process")

    #Report any error messages that tools in this script might have generated
    arcpy.AddMessage(arcpy.GetMessages(2))

#Delete the built layer, even if the rest of the script does not run
finally:
    #Delete layer
    arcpy.Delete_management(lyrName)
```

Join CSV to feature class

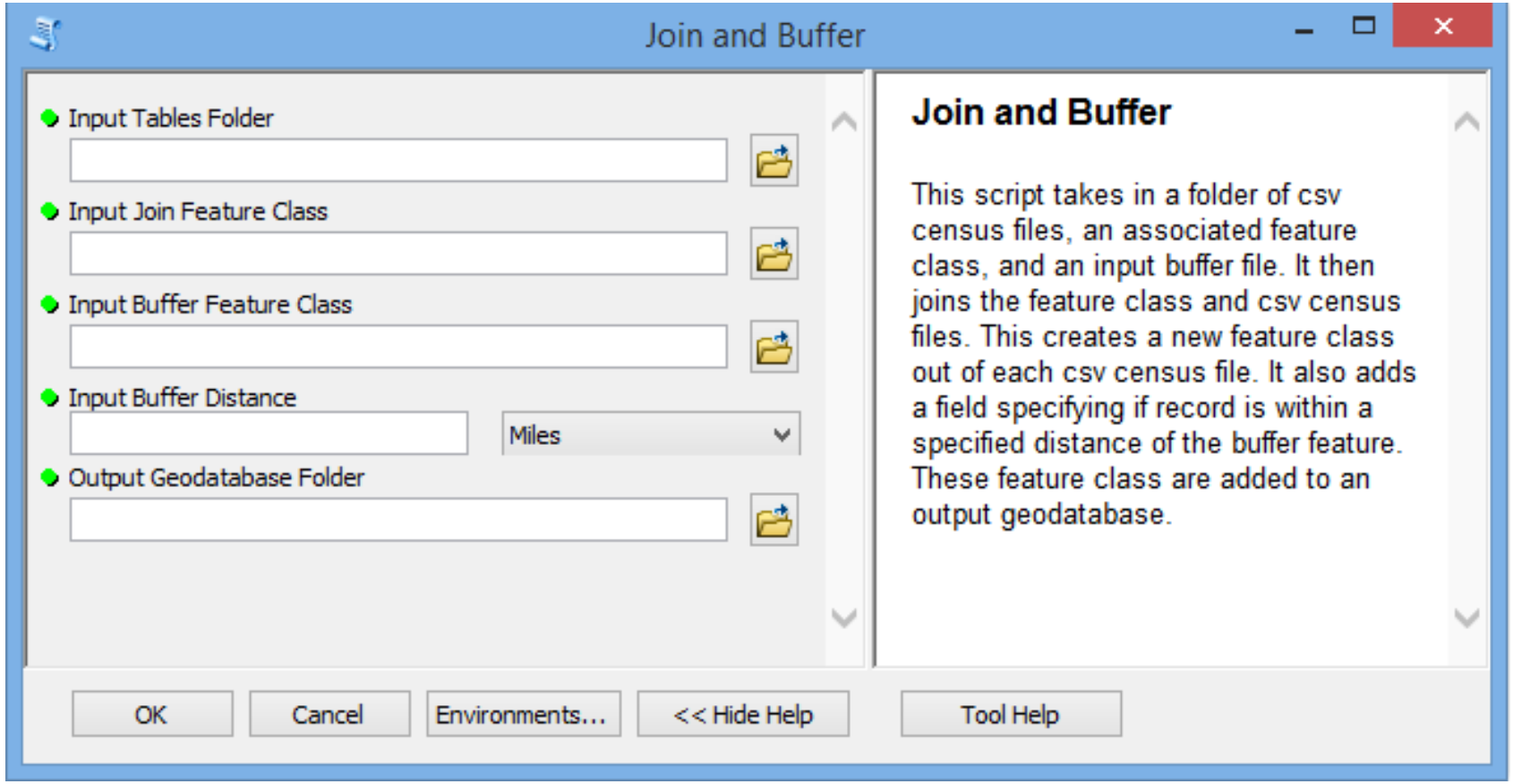
Create feature class

Error Handling

ArcPy

Python Script Tool

- Use script in other projects
- Rework process
- Change input files
- Change buffer distance



Thank You

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