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Geospatial analysis needed for Mitigation app #80

Open **erfangoharian** opened this issue on Jul 27, 2020 · 8 comments

Assignees

Projects Coding Plan

erfangoharian commented on Jul 27, 2020 • edited by Ahad-Hasan-Tanim10

UPDATING 10 YR PROJECT SHAPEFILE

Step 1: In this step update the '10 year project' shapefile by adding new project shapefile. Add the shapefile of new projects (shp2) with existing shapefile (shp1) of '10 year projects ' using the 'Merge tool'. Join the field, 'con_year1' of both shapefiles (shp2 + shp1) and get an updated shapefiles of '10 year project'. Three fields need to be updated 1) ProjectID, 2)ProjectName and 3) Con_Year.

Make sure the field names of shp1 and shp2 are identical. If the fieldnames are not consistent revise the 'shp2'
Check the default parameters of the model.
Create a gdb for internal file processing

Step 2: Check if there is null value in Con_year1. If there are any rows of Con_Year, remain as '0' or 'null' replace it with 'TBD'. Replace null with "TBD". https://support.esri.com/en/technical-article/000016100. This is the new '10 year project shapefile'.

```
def update(val):
if val == 0:
return 'TBD'
elif val < 2022:
return '2022'
elif val >= 2022:
return str(val)
```

Function name: update(!CON_Year!)

FINDING THE IMPACTED STREAM AND WETLANDS

Step 3: Import the rest services (watersheds, wetlands and stream layers) in ArcGIS-Desktop.

Step 4: Create 17.5 feet (Updated) buffer around the SCDOT '10 year project' shapefile using Buffer tool in ArcGIS. Check for any skipping feature because of 'NULL' or 'EMPTY' geometry.

Step 5: Check the coordinate systems of each shapefile in the Source of layer properties. If the '10 year project' coordinate system differs from layer to be extracted then you will need to use the project (Data management) tool. Otherwise, keep the layers as it is.

Step 6: Extract the input rest services that overlay with '10 year project' shapefile using the *clip (Analysis) tool* of ArcGIS.
Here input feature is the rest services and clip feature is the '10 year project' shapefile. After running the tool the portion of shapefile overlap with the '10 year project' shapefile will be extracted. Rename the output feature as 'impact_wtlnd' or 'impact_str'.

Step 7: Use spatial Join tool (Join type= 'within') to import the attribute of Watersheds shapefile to All programming project.

Step 8: Use spatial Join tool (Join type = 'intersect') again to import the attribute of All programming project shapefile into the 1) stream, 2) wetlands shapefiles. Check the name field. Is there any duplicate field present in the stream.

Step 9 (new) Remove the stream/wetlands that contain projectid = Null. These are streams/wetlands which are not truly clipped.

Step 10 (new) There could have some wetlands which may overlap each other. Run the Dissolve tool considering the projectid, projectnam, and projecttyp as field names. The tool combines all overlapped polygons to a single polygon. To identify the impacted stream dissolve tool is unnecessary.

CREATE ATTRIBUTES OF IMPACTED STREAM AND WATERSHEDS BASED ON PROJECT TYPES

Step 11: In this step, the geometry (length, area) will be calculated. The output feature in step 4 have a new length and area which we have to be updated. In order to determine the length of stream layers, a blank field is required to be added in attribute table. Make sure to choose the output features in step 5. Click add field option in the attribute table of the feature and choose appropriate name of the column with data type double/float. Then select the new field of at the tribute table. The geometry can be calculated right-clicking the new field by choosing Get the geometry option. There are options to choose the unit to calculate the length and area.

Step 12: Export the shapefile by right-clicking on the new feature and choose the option Data> Export data. Save this feature in a new directory try and rename to reuse.

Step 13: create new columns for each project type once in "Cut stream" and once for "Cut_area" and put the length or area of each clipped segment in that specific column. This step need to perform using the 'arcpy' command.

Step 14: Finally, the 1) watershed and impacted streams, and 2) watershed and impacted wetlands should be spatially joined again, to have 8-digit HUC watershed attributes.

Step 15 Three shapefiles have to be exported 1) 10 year project (updated one), 2) Impacted wetlands, 3) Impacted streams

Find the banks which are within the service areas

Step 16 Run the join features tool. Join the banks with ribits service area. Target layer = Ribits, Join Layer = Tertiary banks, Join operation = one to many; Spatial relationship = 'Within'

erfangoharian commented on Sep 15, 2020 • edited by Ahad-Hasan-Tanim10 **Author**

An additional step, we need to create new columns for each project type once in "Cut stream layer" and once for "Cut wetland layer" and put the length/area of each project in that specific column using this code:

```
Dim density
If [projecttyp] = "Preservation" Then
density = [cut_acres]

else
density = 0
end if

Field name(density)
```

josemvidal added this to **To do** in **Coding Plan** on Oct 23, 2020

erfangoharian commented on Jun 22, 2021 — Author

@Ahad-Hasan-Tanim10 Can you do the same thing you used to do, with this new project shapefile.
All_prog.zip

erfangoharian assigned **Ahad-Hasan-Tanim10** on Jun 22, 2021

erfangoharian commented on Jun 22, 2021 • edited — Author

Streams:
https://services.arcgis.com/P3ePLMYs2RVChkJx/ArcGIS/rest/services/USA_Detailed_Streams/FeatureServer/0
SC Wetlands: https://smpesri.scdot.org/arcgis/rest/services/Hosted/SC_shapefile_wetlands/FeatureServer/2?token=Gs4toTtykrl81Py5pCIyMXi733ee0xRFmSW4CmtR2I27Z4-gOEEDV3PEKptWEfLHdk3Xdm2UuNbGP6yUov9JcpU6rIRqTIulHDgkpYZKH5rcfcWWkBot78fH8VxRjApFZj7juoEacXsgTcyQl_UAnZCMA_plsL3iME2IlGWEuX3dTlgojcbK2DbYnA1IRPtefa5ce-r96J9_jpztKDsKnQjGMmU9vghsp-lafoxveik.
or SC Wetlands shapefile in: https://smpesri.scdot.org/portal/home/item.html?id=edca754505b64796a696afc34c6775ef
watersheds: https://smpesri.scdot.org/portal/home/item.html?id=d543fbdf99004c9fa02c89de9feb6eeb

Ahad-Hasan-Tanim10 (Ahad Hasan Tanim) commented on Jun 23, 2021 • edited

Adding multiple number of fields in attribute tables:

use arcpy to run the code

```
import arcpy
from functools import partial
arcpy.env.workspace = "C:/Users/ATANIM/Documents/SCDOT project/Allprogrammed prj/--"
shapefile = "clipped_wetlands_prj.shp"
fields = ["BR","Widening",.... .., .... ]
```

addfield = partial(
arcpy.AddField_management,
shapefile,
field_type="DOUBLE",
field_precision=0,
field_scale=0)

for field in fields:
addfield(field)

Code to calculate project wise length/area

inTable = shapefile
fieldName = "Adm"
expression = "func(!ProjectTyp!,!Cut_area!)"

codeblock = """
def func(ProjectTyp,Cut_area):
if ProjectTyp == "Administration":
return Cut_area
else:
return 0"""

Execute AddField

arcpy.AddField_management(inTable, fieldName, "DOUBLE")

Execute CalculateField

arcpy.CalculateField_management(inTable, fieldName, expression, "PYTHON3",
codeblock)

Ahad-Hasan-Tanim10 (Ahad Hasan Tanim) commented on Oct 5, 2021

SQL code to select feature based on attributes:

"ProjectTyp" IN ('Bridge Jacking', 'Bridge Maintenance', 'Bridge Replacement', 'Corridor Improvement', 'Emergency Repair/Replacement', 'Enhancement' , 'Feasibility Study', 'Interchange Improvement', 'Intersection Improvement' ,'New Location', 'Reconstruction', 'Rehabilitation', 'Safety Improvement', 'Shoulder Improvement', 'statewide bridges', 'Widening')

Ahad-Hasan-Tanim10 (Ahad Hasan Tanim) commented on Oct 28, 2021 • edited

Project abbreviations:

Safety Improvement SAI
Reconstruction REC
Rehabilitation REH
Bridge Replacement BRR
Pavement Markings PAM
Preservation PRN
Widening WID
Bridge Maintenance BRM
Signal Signal
Planning & Research PLR
Intersection Improvement ICI
Interchange Improvement ISI
Emergency Repair/Replacement ERR
Resurfacing RES
Corridor Improvement COI
Signing SGNG
Enhancement ENH
Feasibility Study FES
Administration ADM
Shoulder Improvement SHI
Bridge Jacking BRJ
New Location NEL
'Statewide Bridges' STB

Ahad-Hasan-Tanim10 (Ahad Hasan Tanim) commented on Dec 13, 2021

Create random numbers in attribute table

```
import numpy

def getrdv():
return numpy.random.randint(100,1000)
```

Ahad-Hasan-Tanim10 (Ahad Hasan Tanim) commented on Sep 15, 2023 • edited

code to classify different wetland classes

def describe_wetland(column1, column2, column3):
null_count = 0

```
if column1 is None:
    null_count += 1
if column2 is None:
    null_count += 1
if column3 is None:
    null_count += 1

if null_count == 2:
    return "Low Wetland"
elif null_count == 1:
    return "Medium Wetland"
else:
    return "High Wetland"
```

Assignees

Ahad-Hasan-Tanim10

Labels

None yet

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To do

Milestone

No milestone

Development

Create a branch for this issue or link a pull request.

2 participants

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