Where is my little penguin?

A letter from Aleah:

We stopped somewhere in Amers Amherst and took my dog Sadie for walk through the forest to the shore of this beautiful wetland. That's where I think my sister Myah dropped her toy penguin. I have one just like it except mine is a mermaid and I would never lose it like she did. Anyway can you help us?
Oh yeah. My mom says to tell you we never crossed any water or roads on our walk. Also my dad says that we actually passed four pretty large wetlands (all bigger than an acre) but this was the largest of those four. Thank you.

Aleah - age 5 (almost)

I am HERE!

Land Cover

- Penguin (red)
- 0 Open
- 1 Field
- 2 Forest
- 3 Gravel
- 4 Water
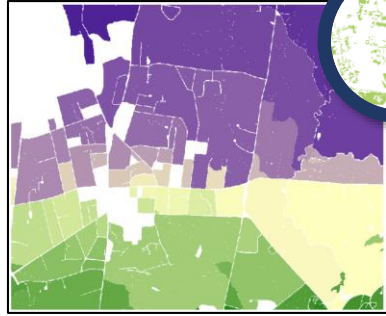- 5 Wetland
- 6 Road
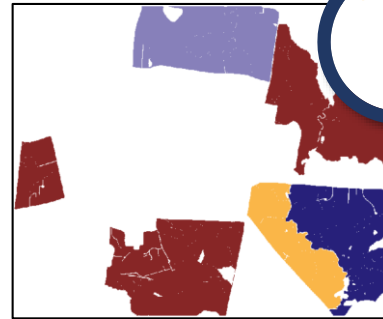- 7 Building

0   0.25   0.5   0.75   1   Miles

N

We make a Plan First

Get rid of roads and waters!

Find blocks that have forests!

Find the blocks with forests that contains large wetlands!

Let's go and find the penguin for Myah!

To find where the penguin is, we need to focus on the area that fulfill the following *4* criteria:

1. The area should not be divided by roads or water inside.
2. The area should contain both forests and wetlands.
3. The area should contain at least 4 wetlands which are larger than an acre.
4. The penguin was left on the largest wetland in that area.
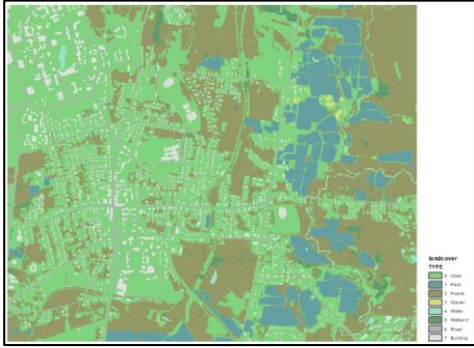

target block!

?MAX!

Find the largest wetland!

I'm here! lol

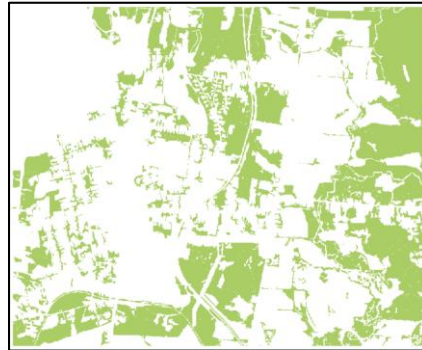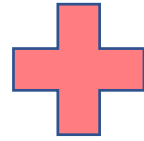# Step 1: Find blocks that not crosses by road and water, but contain forests!
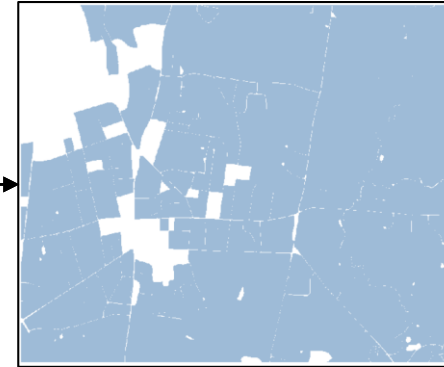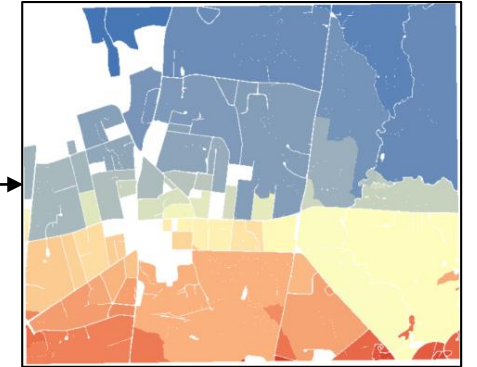
Land cover map

reclassify →
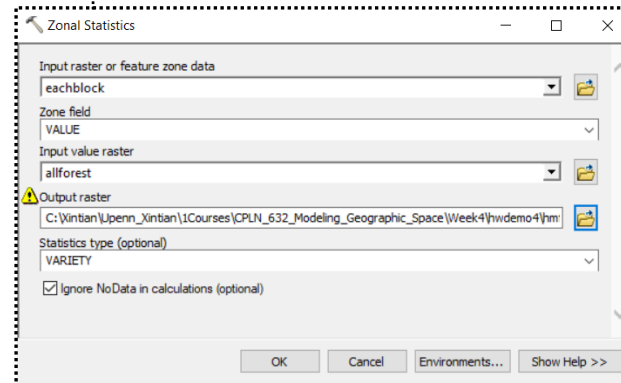
Blocks without water & roads

➕
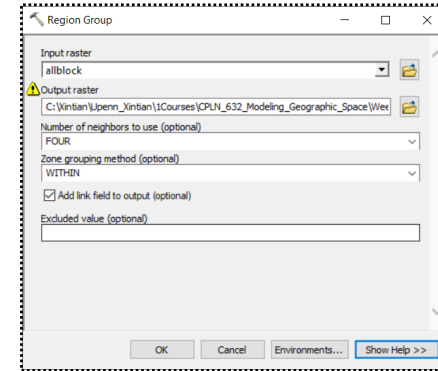

Zonal Statistics →

All blocks without water and roads, but have forests

Region Group →

Each block without water & roads, but have forests
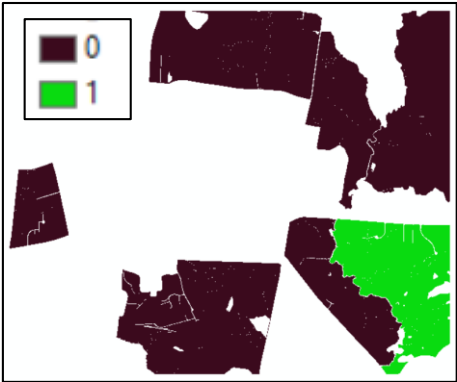

Region Group

Input raster
allblock

Output raster
C:\Xintian\Upenn_Xintian\1Courses\CPLN_632_Modeling_Geographic_Space\Wee

Number of neighbors to use (optional)
FOUR

Zone grouping method (optional)
WITHIN

☑ Add link field to output (optional)

Excluded value (optional)

OK   Cancel   Environments...   Show Help >>

Zonal Statistics

Input raster or feature zone data
eachblock

Zone field
VALUE

Input value raster
allforest

⚠ Output raster
C:\Xintian\Upenn_Xintian\1Courses\CPLN_632_Modeling_Geographic_Space\Week4\hwdemo4\hm

Statistics type (optional)
VARIETY

☑ Ignore NoData in calculations (optional)

OK   Cancel   Environments...   Show Help >>

Step 2: Find wetlands larger than 1 acre!

Land cover map

Each wetland

Reclassify & Region Group

Zonal Geometry

Zonal Geometry

Click error and warning icons for more information

Input raster or feature zone data
eachwetland

Zone field
VALUE

Output raster
C:\Xintian\Upenn_Xintian\1Courses\CPLN_632_Modeling_Geographic_Sp

Geometry type (optional)
AREA

Output cell size (optional)
2

Value
High : 256256

Low : 360   Area of the wetlands

Raster Calculator

Raster Calculator

Click error and warning icons for more information

Map Algebra expression

Conditional
Con
Pick
SetNull

Math
Abs
Exp

"areaofwet" >= 43560

Output raster
c:\Xintian\upenn_xintian\1Courses\cpln_632_modeling_geographic_spac

OK   Cancel   Environments...   << Hide Help

Wetlands larger than 1 acre

☐ 0
☐ 1

Region Group

Each wetland larger than 1 acre

Zonal Geometry

Value
High : 256256

Area of Each wetland
Low : 44924   larger than 1 acre

Step 3: Find the block that contains more than 4 large wetlands!

Each block without forests

Each wetland larger than 1 acre

Zonal Statistics

Raster Calculator

1 larger than 1 acre wetland
2 larger than 1 acre wetlands
3 larger than 1 acre wetlands
4 larger than 1 acre wetlands

Number of large wetlands
in each block

Block with more than 4 large
wetlands-selected area

Step 4: Find the wetland!

The selected block

➕

Value
High : 256256

Low : 44924
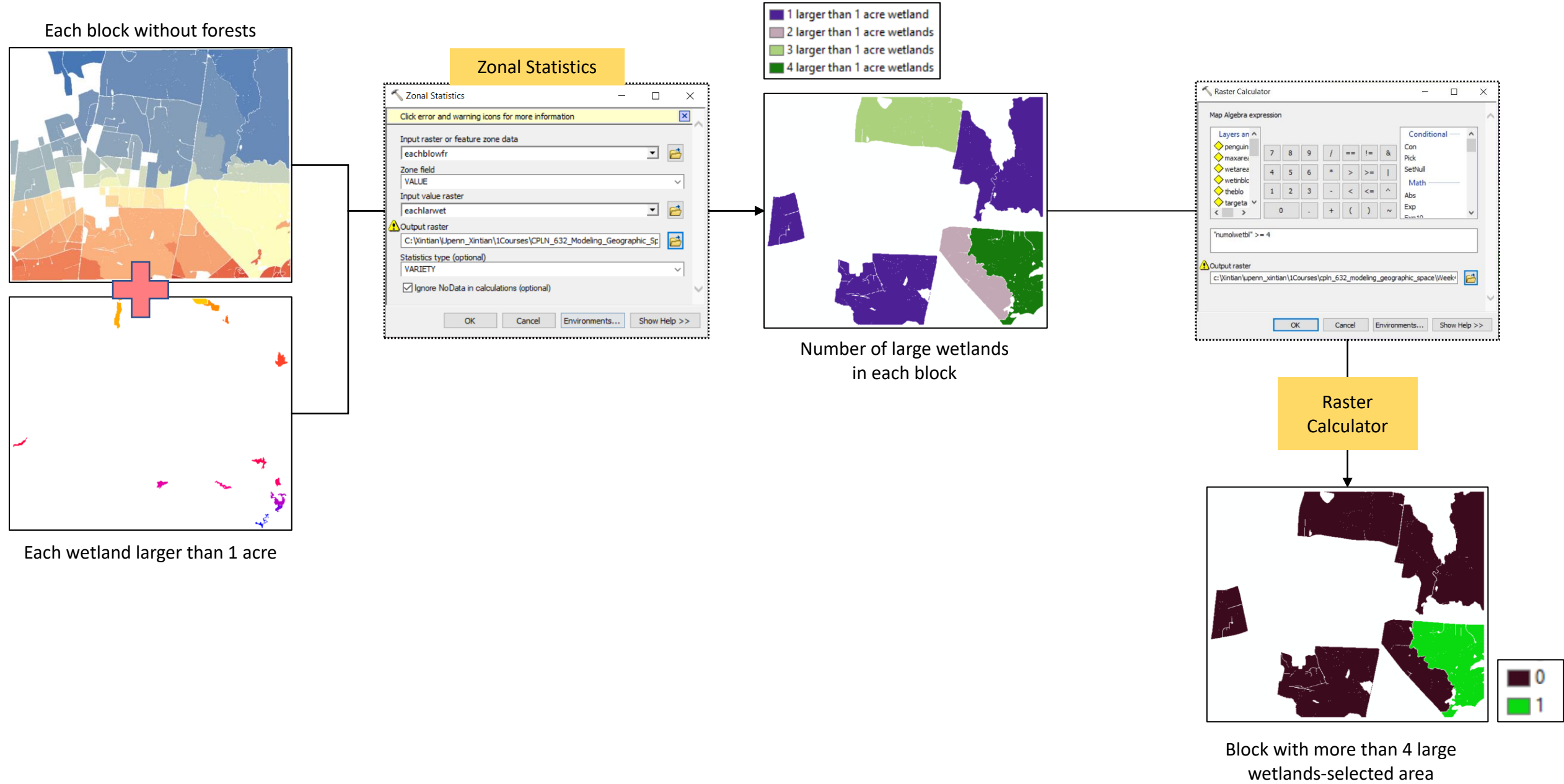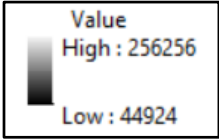
Area of Each Wetland
larger than 1 acre

Raster Calculator

⬛	0
🟩	175,436

🟦	0
⬛	56,812
🟪	64,664
🟥	114,956
🟨	175,436

Area of each large wetland
inside selected block

➕

⬛	0
🟩	1
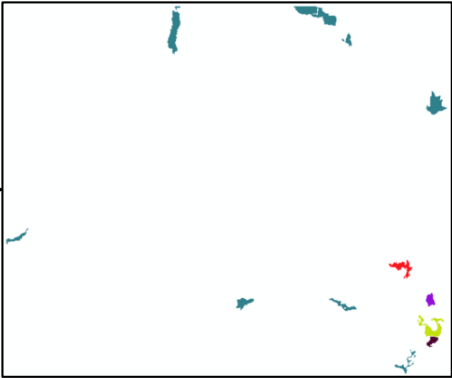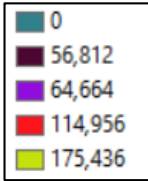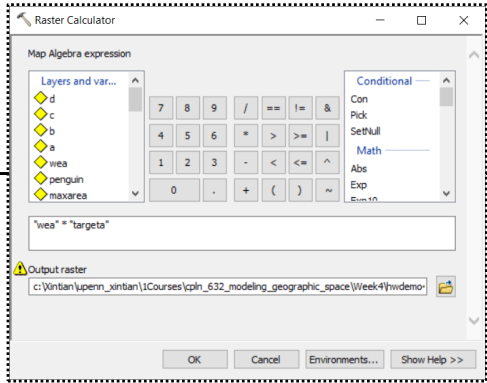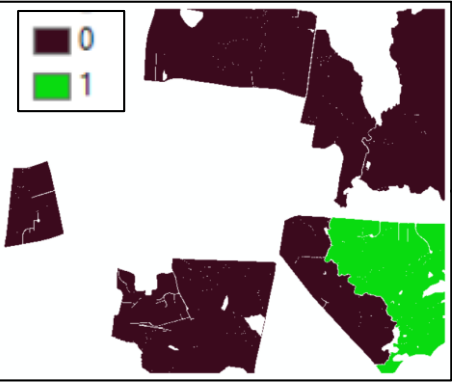
The selected block

Zonal Statistics
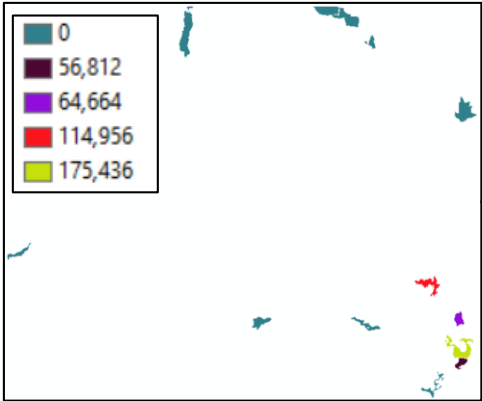
🟩	0
🟪	175,436
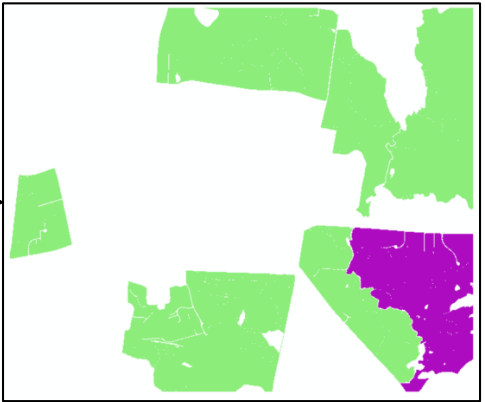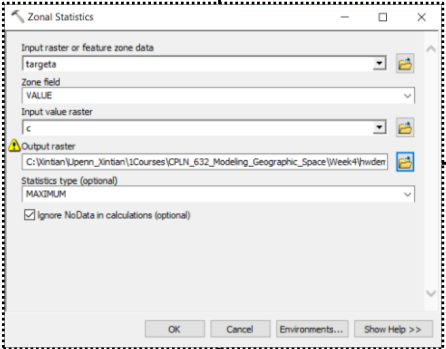
Set each pixel in the selected
block to the maximum **area** value
found to occur in any wetland
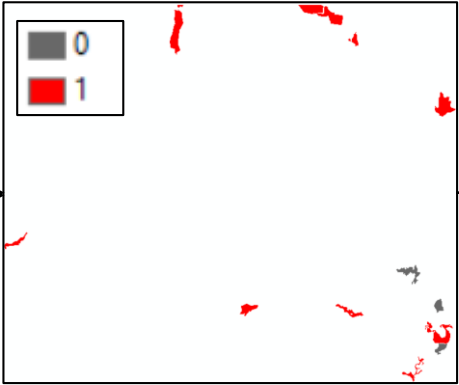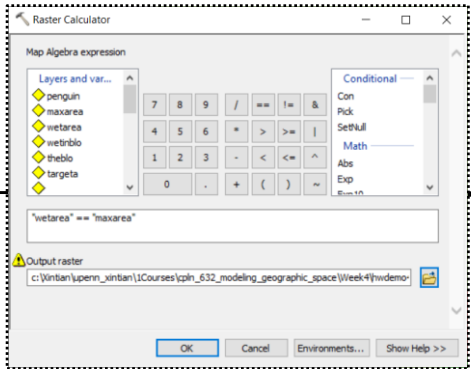within that block.

Step 4: Find the wetland!
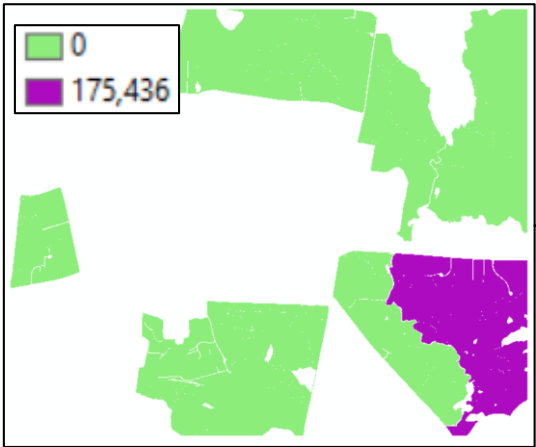
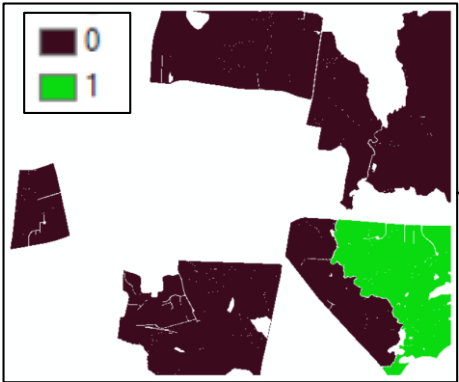The selected block with the area value of the largest wetland in it

Area of each large wetland inside selected block

Legend values:
- 0
- 56,812
- 64,664
- 114,956
- 175,436

Legend values (top left map):
- 0
- 175,436

Raster Calculator

"wetarea" == "maxarea"

Output raster: c:\Xintian\upenn_xintian\1Courses\cpln_632_modeling_geographic_space\Week4\hwdemo-
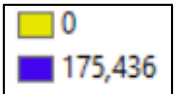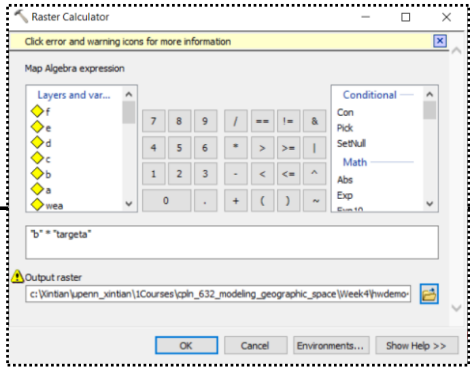
Wetlands that areas are equal to the assigned values of the blocks which it fall into

Legend:
- 0
- 1

Block with more than 4 large wetlands-selected area

Legend:
- 0
- 1

Raster Calculator

"b" * "targeta"

Output raster: c:\Xintian\upenn_xintian\1Courses\cpln_632_modeling_geographic_space\Week4\hwdemo-

The largest wetland(selected)

Legend:
- 0
- 175,436

Little Penguin is here!

Hi, Aleah and Myah. Please be friends with me.