Egeo350 ▯ **Lab-7** ▯ **20** pts

1. Using the web, newspapers or other media sources, locate a *current* example of GIS being used for *spatial* ***analysis*** (something *other* than simple cartography). Write a short paragraph summarizing *how* the GIS was being used (what was being ***analyzed***, what ***question(s)*** were asked/answered). Note that while almost any map you see in the news was likely generated by a GIS-like program, we are looking for a specific use of a GIS for more than just the creation of a map… i.e., geoprocessing or spatial analysis. Be sure to include a citation as to where you got your information and the date (2 pts).

Various examples exist, a few examples:

- Analyzing crime patterns
- Predicting (or assessing) Hurricane paths (and potential damage)
- Wind energy location potentials
- Bird Flu
- Real estate patterns

2-4. Using the Virtual Campus as well as the Text and/or the help sections from ArcGIS/ArcToolbox as references, describe ***IN YOUR OWN WORDS*** the similarities ***and*** the differences between *Clip* and *Erase*, between *Clip* and *Intersect* and between *Intersect* and *Union*. (6 pts):

2. Clip & Erase: A *Clip* is a 'cookie-cutter' type of operation, where the 'clip' polygon layer is used to cut out the features of another (the 'clipped') layer. Only features of the clipped layer that fall inside of the clip layer will be in the output layer. An *Erase* again uses an overlay polygon layer, but unlike the *Clip*, with an *Erase* any feature that falls within the Erase layer is removed, leaving only those features that fall outside of the Erase polygon layer. In both cases, the geometry and attributes of the output layer are derived directly from the main input layer (the clipped or erased layer) with only the spatial extent being derived from the clip or erase layer.

3. Clip & Intersect: With an *Intersect*, two layers are combined with the output being only those features that are in both layers (sort of like a double *Clip*). Unlike a *Clip*, however, with an *Intersect*, the geometry of the two layers is also combined, creating new features that have attributes of both of the input layers.

4. Intersect & Union: *Intersect* and *Union* both combine the geometry and attributes of two input layers. With an *Intersect*, the output layer is clipped to those features which are common to both of the input layers (just where they intersect). With a *Union*, all the features from both input layers is included, combining them where they intersect while still preserving the features where they do not.

(5-10): Start a new .mxd and add the following data (all *Feature Classes*) from the following geodatabases:

- From *your* **Fire.mdb** (in your **Model/FireAssessment** folder, from *Exercise 1 of the Virtual Campus Module 7)*
  - Creeks
  - Roads
  - Lakes
  - Trails
- From *your* **lab-7.mdb** (**lab-7_data** folder, from **J:/saldata/egeo350/data/**):
  - Nests

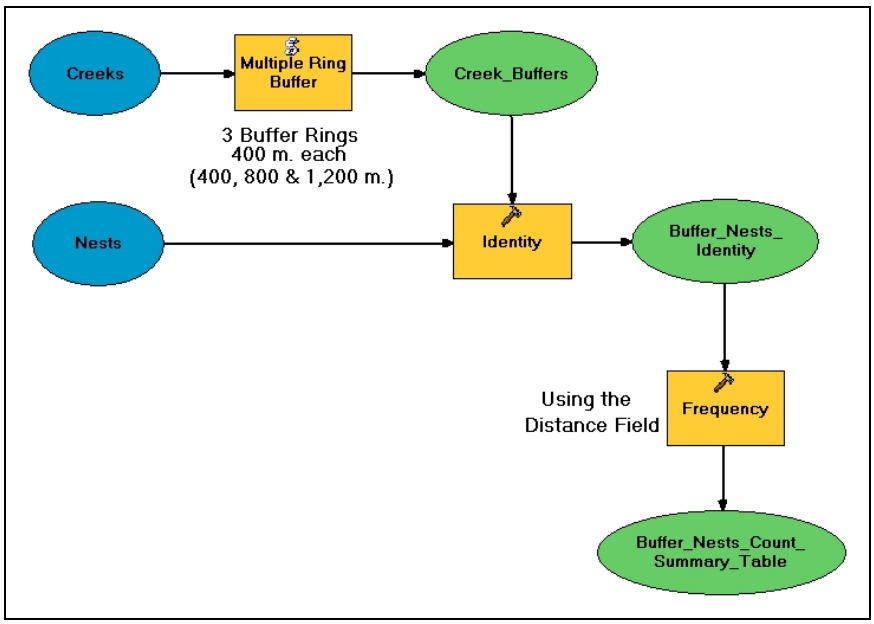
The **Nests** feature class includes locations of Bird Nests in the area. Since it was created, two new nests have been identified, and one needs to be removed. Start editing your **Nests** feature class and add two new nests:

1. A the confluence of *Austin* Creek and *South* Creek (*Type* = Crow)
2. At the furthermost Eastern point of the Lake (right on the shore of the most Eastern edge) (*Type* = Eagle)

There also seems to be an erroneous *Penguin* **Nest** included in the database. Identify this Penguin **Nest** and delete it. Save your edits.

Using your *edited* **Nest** data along with the data from the **Fire.mdb** follow the process steps as detailed in the Data Flow Diagram below. For your *Buffer*, set your *Units* to **meters**. Make sure your buffer output is *dissolved (Dissolve Option* = **ALL**). Leave the *Optional* fields in the *Identity* tool dialog box blank.

Note that you *could* perform this using the **ModelBuilder**. If you wish to try it (for practice), go thru the process manually first, then attempt it with the **ModelBuilder**… If you do use the **ModelBuilder**, use the *Frequency* Tool for the Summarize process (again using the *Distance* Field).



(5-8): Having completed the steps of the DFD above, refer to your output *Summary Table* to determine how many **Nests** are:

5. Within 400 m. of a Creek (1 pt) ? 1

6. Between 400 & 800 m. of a Creek (1 pt) ? 10

7. Between 800 & 1,200 m. of a Creek (1 pt) ? 6

8. Further than 1,200 m. of a Creek (1 pt) ? 6

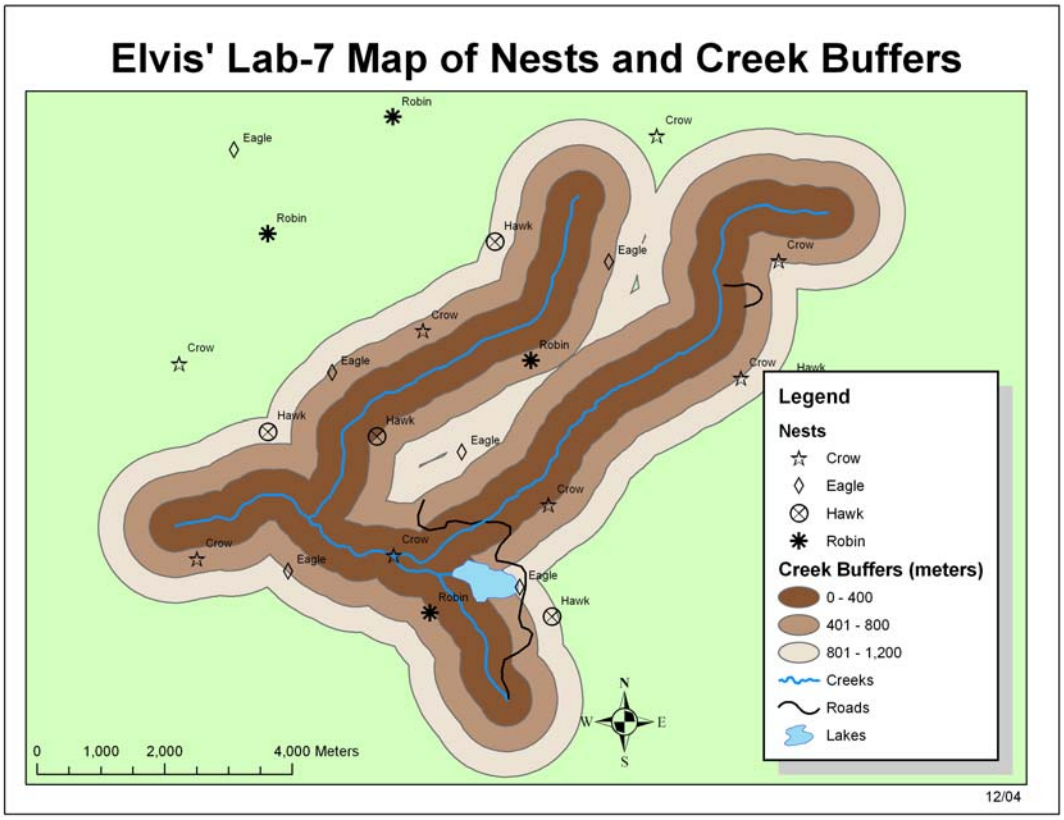
9. Print a copy of your **Buffer_Nest_Count_Table** (the *Summary Table* following the *Identity* process above). Oddly enough, there is not a way to simply print a table from ArcMap. To do this (2 pts):

1. *Open* your *Summary Table*
2. From the *Options* menu, choose *Add Table to Layout*
   (this should add a copy of the table to the map layout and switch ArcMap to *Layout View*)
3. Temporarily turn off (make not visible) all of your features
   (uncheck each layer in the *Table of Contents* so only the table is shown on your map layout)
4. Add your name (as a text element on the layout) (add the *Drawing* toolbar if need be to use the *New Text* tool)
5. From the *File* menu choose *Print*

Staple print out to this lab (along with the map print-out below).

OBJECTID*	distance	Count_distance
1	0	6
2	400	1
3	800	10
4	1200	6

10. If not in *Layout View*, switch to *Layout* View. Remove the *Summary Table* from your layout (or make it smaller so it fits into the layout with the rest of the map data). Turn on the relevant layers again to create a map of your work. Make sure that your **Creeks**, **Creek_Buffers**, **Lakes**, **Roads** and **Nests** *are all visible*. Symbolize them appropriately (so we can see all of the features in BW). Zoom in/out as need be to show the entire area within the 1,200 m. buffer of the **Creeks**. Legend, labels, scale bar, etc are all OPTIONAL. Make srue your name is on the map. Print your map (BW is fine) to hand in (2 pts).



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(11-12) A “mean center” is the average (mean) location of a group of features. For a series of points, such as the **Nests**, the process is to determine a mean center is to simply average the X-coordinates and then average the Y-coordinates and then create a new feature using these X-Y coordinate averages. In **ArcToolbox**, use the *Mean Center* tool (located in the *Spatial Statistics Tools / Measuring Geographic Distributions* toolbox) to create a new *Feature Class* of the mean center for the **Nests** (leave the *Optional* fields in the *Mean Center* dialog box blank). Make sure you are using your *edited* version of the **Nests** (with the two new nests and without the Penguin nest). Save your new *Feature Class* in your **Lab-7.mdb** geodatabase with an appropriate name.

11. Compare the location of the mean center of the **Nests** layer (a point, representing the spatial average of all **Nests**) with your **Creek_Buffers** layer. Is the **Nests** mean center (choose one) (2 pts):

Within 400 m. of a Creek
Between 400 & 800 m. of a Creek
Between 800 & 1,200 m. of a Creek
Further than 1,200 m. of a Creek
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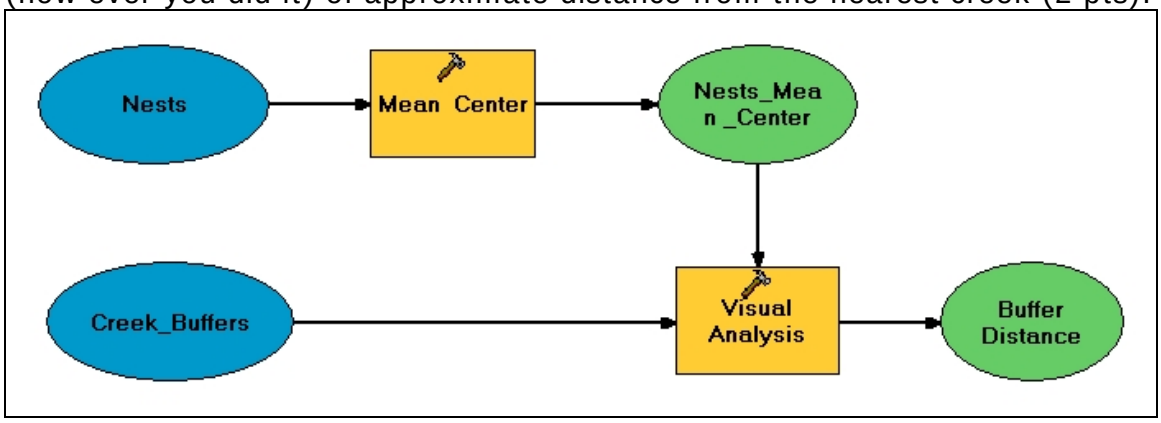
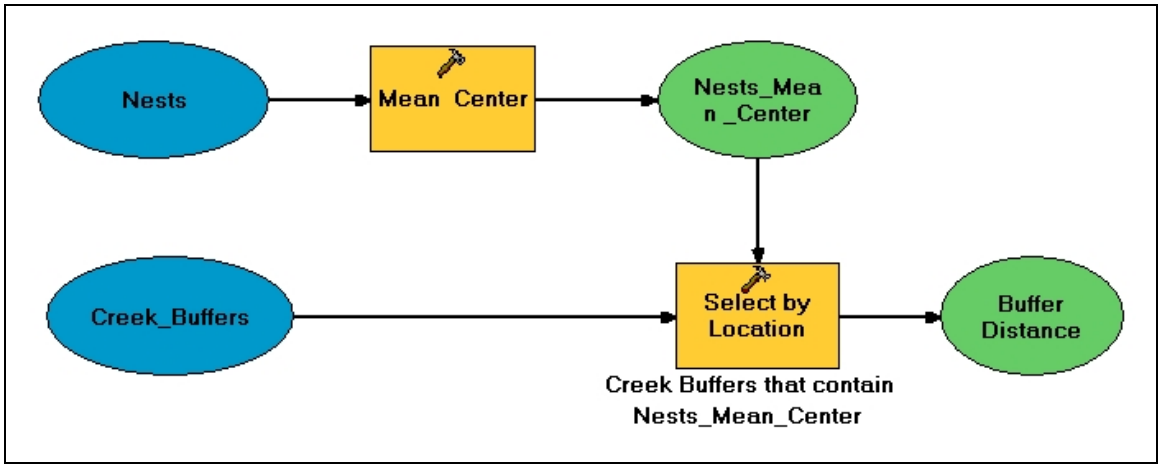
12. Draw a DFD for the steps you used to answer the above question, including the creation of your mean center feature and the determination (how ever you did it) of approximate distance from the nearest creek (2 pts).





NOTE: you could also use *Identity*