This lab will focus on spatial analysis in ArcGIS 8. It includes selecting by location, spatial joins, buffering, intersecting, unioning, and projections…it’s a long one.

In-class portion:

A. Copy the lab05 folder from T:\geog419\ to V:\geog419\yourlastname\  
B. We will be completing ESRI exercises 10, 11, 12 & 13.  
C. Whenever the book refers to the default path (C:\GTKArcGIS), substitute the correct location. For example, in step 5A.10, save the map file to V:\geog419\yourlastname\Chapter05\MyData. Follow this convention throughout the book.

Supplemental Portion:

D. Create a new map named yourlastname5.mxd in the V:\geog419\yourlastname\ab05 directory  
E. Let’s try to find a place to put a kayak company specialized in nature tours. Our criteria will be: must be more than 2 miles away from any town or city, must not be on a main road (US or state highway), must (of course) have a road intersect a river, must have the most forest cover possible within the intersection.

Be sure to place all of the files you create in V:\geog419\yourlastname\lab05

Here’s how I think the steps should go:

1. Merge the municipality boundaries  
   u:\mdpropview\some2003\overlays\smgr_pfa\somemuni.shp  
   u:\mdpropview\wico2002\overlays\smgr_pfa\wicomuni.shp  
   u:\mdpropview\worc2003\overlays\smgr_pfa\worcmuni.shp  
   Create: les_munis.shp

2. Buffer les_munis by 2 miles  
   Create: munibuff.shp

3. Dissolve the county boundaries of the study area  
   u:\geog\dmv\regcntys
   Copy regcntys to v:\geog419\yourlastname\lab05
   Calculate REGCNYTS-ID to 1
   Dissolve on REGCNYTS-ID
   Create: lesarea.shp

4. Erase the muni buffer from areas boundary  
   Union, then reselect the correct polygons
Create: areabufunion.shp, lesisolated.shp

5. Reselect river arcs that intersect lesarea
   u:\hydro\dmv\arc100k_sp83m
   Select ENTITY_LABEL = 0500412 first, then reselect intersection
   Create: riverarcs.shp

6. Buffer the river arcs by 500 feet
   Create: riverarcbuff.shp

7. Reselect river polys
   u:\hydro\dmv\poly100k_sp83m
   Select ENTITY_LABEL = 0500116 or 0500412
   Create: riverpolys.shp

8. Clip riverpolys with lesisolated
   Create: rivpolyclip.shp

9. Buffer the clipped river polys by 500 feet
   Create: riverpolybuff.shp

10. Union riverarcbuff and riverpolybuff
    Create: riversbuffunion.shp

11. Dissolve riverbuff
    Calc ID = 1
    Dissolve on ID
    Create: riverbuff.shp

12. Clip riverbuff with lesisolated
    Create: rivbuffclip.shp

13. Select those roads that are US highways and State highways
    u:\trans\md\madrds.shp
    Create: bigrds.shp

14. Select all of the roads in that are not within 100 feet of the selected major roads
    u:\trans\dmv\lesroads_2002
    Select within a distance of, then switch the selection
    Create: smallroads.shp

15. Select all of the roads that intersect rivbuffclip
    Create: smallroadint.shp

16. Buffer the smallroadint by 500 feet
    Create: roadsbuff.shp

17. Intersect rdbuffclip and rivbuffclip
    Create: riv_rd_int.shp
18. Create a unique identifier for each intersection polygon
   In riv_rd_int.shp, calculate ID = FID

19. Select the forest cover in each county
   u:\landuse\Somerset\somer
   u:\landuse\Wicomico\wicomi
   u:\landuse\Worcester\worcest
   LUCODE = 41, 42, or 43
   Create: somer_forest.shp, wico_forest.shp, & worc_forest.shp

20. Merge the three county forest coverages into one
    Create: les_forest.shp

21. Union riv_rd_int.shp and les_forest.shp
    Create: for_riv_rd_uni.shp

22. Reselect all union polygons that were within riv_rd_int.shp and were forest
    Reselect ID <> 0 and LUCODE <> 0
    Create: key_forest.shp

23. Update the Area of the polygons and calculate the area in acres
    a. Open the attribute table of key_forest.shp
    b. Select Options ➔ Add field…
    c. Name the field calcarea, type double, precision 15, scale 4
    d. Right-click the calcarea column heading; select Calculate Values
    e. Check Advanced
    f. Type the following VBA statement into the first text box
       
       Dim dblArea as double
       Dim pArea as IArea
       Set pArea = [shape]
       dblArea = pArea.area
       
       g. Type dblArea into the second text box
    h. Click OK
    i. Select Options ➔ Add field…
    j. Name the field acres, type float, precision 10, scale 3
    k. Right-click the acres column heading; select Calculate Values
    l. Type calcarea / 4046.85642

   Now you have the area of the polygons in acres

24. Summarize total acres by ID
    Create: totalacres.dbf

25. Sort summary table by Sum_Acres to find three largest areas.

D. Make maps of the top three sites with context information and labels (taken from atlases, local knowledge, etc). Name them: yourlastname1, 2, & 3.mxd