ES492/592 GIS Applications in Earth Sciences
End-of-Workshop Project DUE: with final lab portfolio, Wed. March 22, 2006

Your job is to compile a complete set of GIS vector map themes, digital elevation models, digital orthophotoquads, and DRG's for a select watershed in western Oregon. In addition you will calculate some basic watershed parameters from your GIS compilation.

Student	**Assigned Coast Range Watersheds**
Cody Hoehna	1. Gales Creek Watershed (Tualatin Basin, Washington County)
Shelby Collins	2. Elk River Watershed (Sixes River Basin, Curry County)
Mike Walberg	3. Calapooya Creek Watershed (Umpqua Basin, Douglas County)
Caleb Downing	4. Schooner Creek-Drift Creek Watershed (Siletz-Yaquina Basins, Lincoln County)
Andrew Akerson	5. Beaver Creek-Waldport and Big Creek (Alsea basin, Lincoln County)
Jamie Fisher	6. Big Elk Creek (Siletz-Yaquina Basins, Lincoln County)
Sally Kirkpatrick	7. Clatskanie River (Lower Columbia basin, Columbia County)
Blake Barr	8. Cook Creek / Lower Nehalem (Nehalem basin, Tillamook County)
Joel Plahn	9. Deadwood Creek (Siuslaw basin, Lane County)
Dane Wagner	10. Kilchis River (Wilson-Trask-Nestucca basins) Tillamook County)
Dan Zinn	11. Youngs River (Lower Columbia basin, Clatsop County)

Instructions: All final project materials will be included at the end of your portfolio binders. Make sure you organize your final projects by Task No., and clearly label the sections in order of appearance below.

Task 1. Using the Coast Range Watersheds theme from the class website (under the final project section), find all of the subbasins that are contained within your assigned watershed.

Task 2. Identify the County(ies) in which your watershed (and related subbasins) is (are) contained.

Task 3. Identify all of the USGS 7.5-minute quadrangles that contain portions of your watershed.

Task 4. Using ArcView, select your watershed sub-basins from the Coast Range Watershed theme and convert them to a new, stand-alone shape file.

Task 4A. Create a map layout, with name, title, scale, north arrow, legend, etc. Print your new watershed subbasin theme map.

Task 5. Using ArcView, dissolve your sub-basin polygons into one large watershed polygon outline for your study site.

Task 5A. Create a map layout, with name, title, scale, north arrow, legend, etc. Print your new consolidated watershed boundary theme map.

Task 6. Using ArcView and the 1:24000 State Quadrangle polygon theme from the class web site (under the final project section), select all of the quads that contain your watershed footprint. Convert the selected quadrangles to a new, stand-alone shape file that can be used as an overlay on your watershed footprint.

Task 6A. Create a map layout, with name, title, scale, north arrow, legend, etc. Print your new quadrangle map with watershed footprint overlay.

Task 7. Using ArcView and the "Coast Range Streams" theme from the class web site (under the final project section), clip the stream coverage so that it forms an overlay within your watershed footprint.

Task 7A. Create a map layout, with name, title, scale, north arrow, legend, etc. Print your new watershed footprint theme map with stream pattern overlay.

Task 8. Use the ArcView table manager and your newly created watershed themes to determine the following watershed parameters:

Total Drainage Area (sq. meters) _____

Total Drainage Area (sq. km) _____

Total Length of Watershed (sq. km) _____

Total Width of Watershed (sq. km) _____

Watershed Length/Width Ratio _____

Total No. of Subbasins in Watershed _____

Average Area of Subbasins in Watershed _____

Total No. of Stream Segments or Tributaries in Watershed _____

Total No. of First Order Stream Segments _____
(note: on the streams layer, the "order" field on the database
Represents the stream order or relative scale of stream,
1 = smallest size, 2,3,4…n = largest size)

Total No. of Second Order Stream Segments _____

First Order Stream Frequency (Total No. / Drainage Area) _____

Task 9. For your selected watershed, use the GIS web links on the class web site (plus any others that you may find) to download and assemble the following GIS themes:

USGS DRG (raster)	Soils (vector)	Census tracks (vector)
USGS DEM (raster)	Vegetation (vector)	
Bedrock Geology (vector)	Roads (vector)	
City Boundaries (vector)	Streams (vector)	

Parameters:

9-1. convert all map themes to UTM meters, Zone 10 North (NAD_1927)

9-2. Clip each vector file so that each theme perfectly overlays the watershed boundary footprint.

9-3. Using layout with student names, quadrangle name, map theme title, scale, north arrow, legend, print the following and assemble in a neat looking package to include in each of your portfolios:

Printout for each watershed

A.	Quad DRG's	D. Soils on DEM	G. Cities on DRG
B.	Quad DEM's	E. Bedrock on DRG's	H. Streams on vegetation
C	Vegetation with polygons labeled	F. Roads on bedrock	I. Census tracks on DRG

J. Labelled watershed subbasins on DRG

Task 10. Using the class web site resources and download links, find and assemble all of the Digital Orthophoto Quads for your watershed (Mr. Sid files are the most compact and easiest to use). Using layout with student names, quadrangle name, map theme title, scale, north arrow, legend, print the DOQ's to include in each of your portfolios. You do not have to reproject the DOQ's that you download, leave them in their native projection format.

Task 11. save and assemble all of your data and project files on a CD to submit with each of your portfolios, respectively. Organize your folders and subfolders according to projection type, as discussed in class.

Task 12. Using ArcView Spatial Analyst, your assembled DEM's, and watershed themes, calculate the following watershed parameters:

Minimum Watershed Elevation (feet) _____

Maximum Watershed Elevation (feet) _____

Minimum Slope (decimal degrees) _____

Maximum Slope (decimal degrees) _____

Task 13. Copy/Save/Compile all of your GIS themes, shapefiles, grids, and raster graphics onto a CD. Organize your data folders according to projection and theme topic. Include an MS-word document that provides a list of the GIS files you have compiled, a brief explanation of what the files are comprised of, and a list of projections. Include the URL web link of the site that you used as a datasource for each map theme. This word document will serve as your metadata.