GIS Projects for 1.963

Fall 20004

Objective:

To expand and apply your knowledge of GIS on a hands on project. The parameters are broad, which gives you the latitude to organize a project that you are interested in and will add to your GIS experience.

Three options are available:

1) Default project – use HEC-RAS tools and Arcview 3.3 to determine flood plains. HEC-RAS is the Hydrologic Engineering Center's River Analysis System. This software interfaces with Arcview 3.3, the predecessor to ArcGIS 8.X family of software. You will need to download the HEC-RAS software and install it and obtain the Arcview 3.3 CDs and install the software, including the Spatial Analyst extension. You will obtain Digital Elevation Models, convert these to Triangulated Irregular Networks (TIN), a different data format useful for elevation data, and use this in Arcview and HEC-RAS to locate flood plain boundaries.

2) A project associated with your MEng project. This has to be GIS focused and strongly related to your MEng project. The faculty advisor of the MEng project must approve of this project. Unlike the other options, if you are the only member of a MEng project team in this class, you may do this project alone.

3) You can develop a GIS project based on your own ideas and interests. Your project must include data collection and processing that demonstrates your group's understanding of GIS.

All project proposals must by email by 5th October. Project proposals should include the goal of the project, the data that you intend to collect, and the processing that you think you will need.

The scope of this project is limited because of the time frame and you current knowledge of GIS and its applications.

Team size:

A person may opt to work individually, if the work is associated with their MEng project, as mentioned above. Teams of 3-5 students are allowed.

Recent projects:

Finding potential locations for cell phone towers – students used GIS to locate locations for new cell towers to fill in gaps between existing cell towers. Students found locations and heights of existing cell towers, used industry standard equations for strength propagation to determine where current cell coverage exists. They used the locations of roads to determine where travelers would benefit from new cell coverage and used census data to determine where the most people would benefit as well.

Using handheld GPS and GIS to determine the temperature and oxygen structure of a lake – students borrowed boats and instruments to collect the temperature and oxygen data on a nearby lake at several depths. The students used hand held GPS and GIS to locate where they sampled and record this information. The students then used a 3D viewer (ArcScene) to visualize the data. Students made maps to show the distribution of temperatures and 3D maps and cross sections to show temperature inversions and at various parts of the lake.

What you need to produce:

Project teams will be given space on the network to store their data, both what you create and what you may download, and any derivative data from processing. The project shall be followed by a project report which details methods, concepts, and software, as well as the usefulness of the project.

Schedule:

Date	Event
October 5	Project proposals due by email
October 6	Approval of proposals; Reviewed and modified proposals returned
October 7	Project Work starts
October 24	Project reports due by email
October 25	Project presentations

Things to think about

Groups that are thinking about collecting international data as part of their project should be aware of that it is often difficult to obtain and time consuming if it is even possible.

Given the short time available, you should investigate the availability of data before you submit the project proposal.

The overall time frame of the class and the project is short. As you consider what you want to explore, keep in mind the time frame that you have to work with.