

**Software Tools for Environmental Field Study (STEFS)
1.992 Special Studies in Civil and Environmental Engineering
Fall 2001 Term**

STEFS Project Summary

Professional practice requires that earth scientists and environmental engineers have a strong background in environmental field work. This practice, however, is still by large dependent on the pencil and paper field book. Current advances in mobile computing and the proliferation of hand-held devices have spurred the potential for developing software tools to assist environmental engineers in improving the collection of data in the field. Such advances will increase the efficiency of costly field work and lead to improvements in sampling and data accuracy. Surprisingly enough, software applications custom-tailored for environmental scientists are not currently available. This project proposes to develop environmental software applications for hand-held, portable computers to be used directly for gathering, storing and manipulating environmental and geospatial data. Through the development of an electronic journal, field personnel will be able to record environmental and geolocal data automatically. It is envisioned that an application for hydrology and water quality sampling, as well as field mapping and positioning, will be developed. Current advances in mobile computing, such as GPS and GIS, will be also incorporated into the electronic field notebook. The final objective of the project is to develop a prototype system and test it in relation to a scientific field campaign. Software improvements based on the feedback from the field test are also an anticipated activity.

STEFS WorkingGroup Projects

The goal of each WorkingGroup project is to deliver a portion of the STEFS prototype. The seminar class will be divided into teams of 2-3 people for working on a specific portion of the prototype. The following are suggested ideas to be pursued within the WorkingGroup along with advise from an assigned team advisor:

1. Development of the GUI and computations for stream flow manual measurements.
2. Development of the GUI and computations for chemical parameter manual measurements.
3. Development of GIS scripts for enhanced visualization of GPS geospatial data.
4. Development of active control and query system for automated water quality probe measurements.
5. Development of database components for the electronic journal including syncing with field labtop.
6. Development of hardware for field deployment including casing, external battery pack, cabling.