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This summer, the **GeoTREE Center** at the University of Northern Iowa (UNI) offered a series of geospatial technology workshops to the federal, state, local, and tribal agencies (FSLT) located in Iowa. Topics included basic to advanced geospatial technology concepts and provided a forum to discuss geospatial technology-related questions. All workshops were held in the GIS Lab of the Geography Department at UNI's newly renovated Innovative Teaching and Technology Center (ITTC).



GPS participants use hands-on training on the UNI campus

Following is a summary of the five summer training sessions. As all workshops were hands-on, participants had the opportunity to use GIS software and data related to each workshop topic. Workshops filled quickly to capacity, with waiting lists for each program.

- 1. Geodatabase for local and state governments** was held on July 19th. This workshop taught participants to discover the capabilities of the geodatabase and how to migrate existing GIS data to building a geodatabase for ArcGIS 9, focusing on FSLT agency applications. This program also focused on the strengths and limitations of migrating to the Geodatabase model.
- 2. July 26th, Remote Sensing data into GIS** explored how to view, analyze, and integrate raster data, particularly air-borne and satellite remote sensing data into GIS. Dr. Fred Fryman, UNI Associate Professor, gave a presentation on Aerial Photo/Image Interpretation.
- 3. GPS Data into GIS** provided participants with a complete overview of the GPS to GIS cycle, from data collec-

tion to incorporating GIS. Participants learned how to complete a mapping project from start to finish, and also learned the basics of GPS, along with how to collect and process data hands-on using Trimble GeoXT GPS equipment. This August 2nd workshop allowed participants to participate both in the classroom, and a field exercise. Administrators including new UNI President Benjamin Allen, Provost James Lubker, Dean Julia Wallace, and new Department of Geography Head Patrick Pease visited during this session.

4. Python Scripting for GIS Experts taught participants about the Python scripting language and how it can be used to access the geoprocessing functionality in ArcGIS 9. Initially participants began by understanding the Python scripting syntax, progressed to writing scripts for geoprocessing operations, and finished by incorporating Python scripts as tools in ArcToolbox.

5. LiDAR Workshop GeoTREE sponsored this May 31st workshop which was organized by DNR. The program began with a quick review of 'what LiDAR is', followed by accessing real data from around the state using ArcMAP. Data from the Des Moines LiDAR project and the UNI campus map were also viewed.

Plans are in motion to schedule similar programming during the summer of 2007. These will be announced at a later date both in this publication as well as on our web site:

www.geotree.uni.edu



President Allen addresses GPS workshop participants

Current Research Activities

A. West Nile Virus Habitat Analysis

Research within GeoTREE has continued in the public health area focusing on ecological study of mosquito populations and the dynamics of West Nile Virus (WNV). Graduate student Scott Larson is leading a 4-month field study which collects mosquitoes at 12 sites within Black Hawk County. Collected mosquitoes are counted and identified to species level. This data will be used to try to understand the local spatial and temporal patterns of different mosquito species and how this could possibly affect WNV transmission. In addition to the field study, previous mosquito population data (2003) is being analyzed in relation to a suite of spatial data on environmental and social conditions. Initial spatial analysis is helping to distinguish the important environmental conditions that potentially control mosquito abundances. Soil drainage conditions and land cover are being shown as important parameters as seen below. In addition to the local study, state-wide analysis is focusing on WNV incidence in relation to spatial data including remote sensing derived data such as Normalized Difference Vegetation Index (NDVI). Four years of WNV incidence data has been compiled as well as six years of NDVI data for Iowa (see below) and is presently being analyzed. John DeGroot will be presenting initial results of this research at two conferences in October. The first is the EcoHealth conference in Madison, Wisconsin which will focus on public health issues in relation to their ecological relationships. The second conference is the ESRI Health GIS conference in Denver, Colorado.

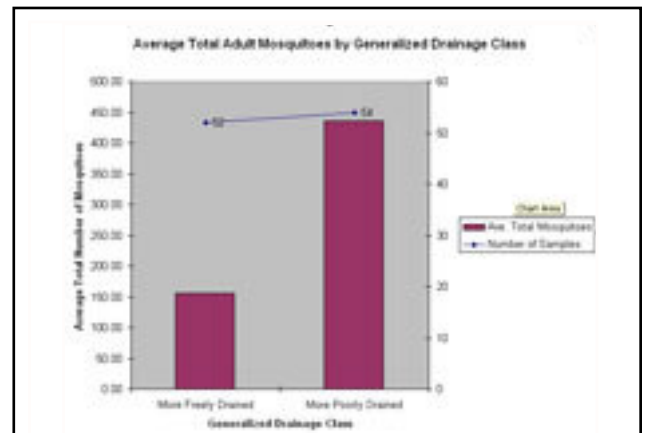
B. Water Quality Monitoring Project

Work continues involving the monitoring of the water quality of Clear Lake using hyperspectral satellite remote sensing. To date, 3 satellite images of the lake have been collected parallel to collection of 50 water samples. There are 2 additional collections scheduled for Clear Lake through the end of October. Upon completion of data collection, statistical analysis on the data will begin. Water quality estimation algorithms will be developed that will estimate a variety of water quality characteristics for the entire lake. The results of this study will be presented to the Iowa Department of Natural Resources as an alternative method for monitoring the water quality of Iowa lakes.

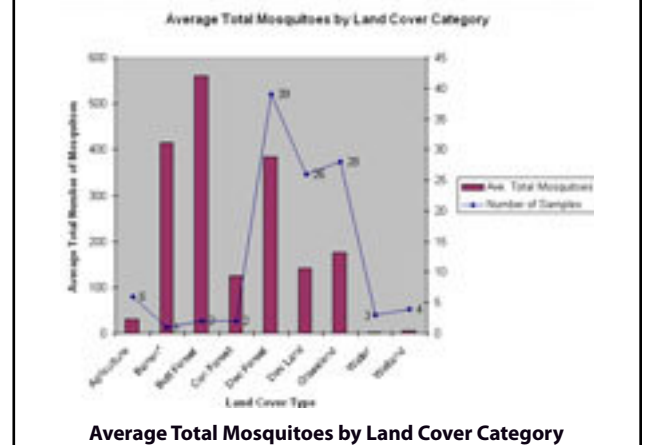
C. Watershed Management Priority Index (WMPI)

A web-based Watershed Forest Management Information System is under development with a goal to protect water resources through land conservation, restoration, storm water management, stream crossing evaluation, and control on forest harvest.

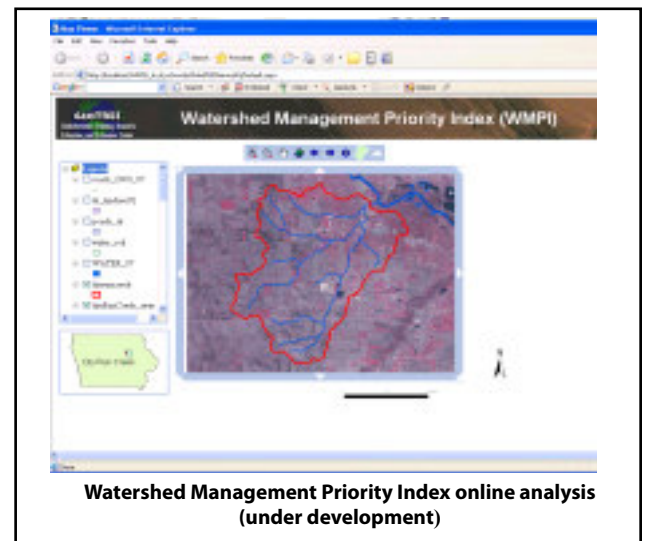
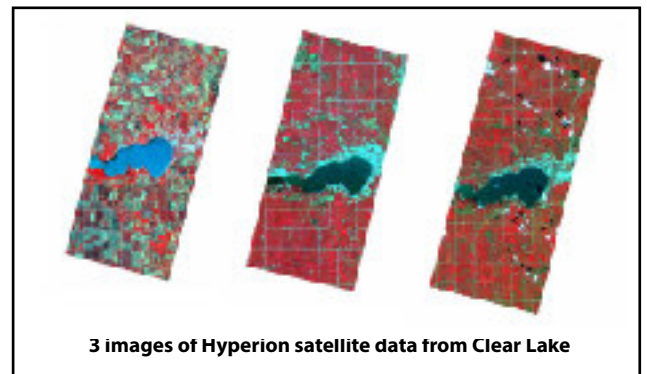
As the analysis process needs special GIS knowledge, GIS software's high cost, and the necessity to involve public in watershed management, an online version of WFMIS is planned by GeoTREE staff to facilitate the use of WFMIS and help people manage their watershed. At the first stage, because Iowa's land cover is mainly agriculture land, only WMPI will be developed (see image at the right) and the Dry Run creek watershed will be the test area.



Average Total Adult Mosquitoes by Generalized Draining Class



Average Total Mosquitoes by Land Cover Category



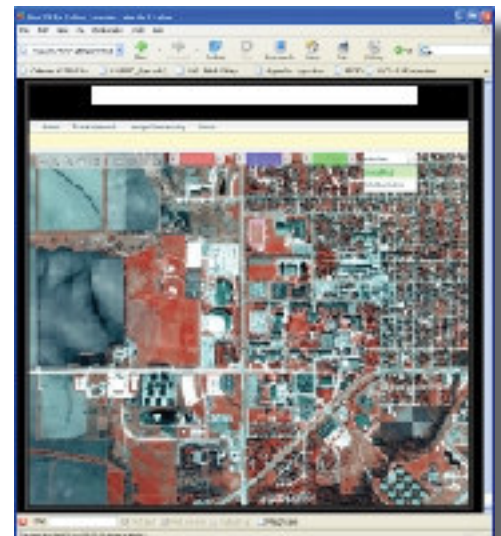
Current Education and Outreach Activities

Marc Peterson attended the **IEEE International Geoscience and Remote Sensing Symposium (IGARSS)** in Denver, July 31st through August 4th. Marc presented a poster of preliminary agricultural modeling research results. The aim of this research is to develop a near-real-time crop yield prediction system for Iowa based on historical yield data, Normalized Difference Vegetation Index (NDVI) measurements from MODIS satellite data, and important environmental variables such as rainfall, surface temperature, and soil characteristics. Starting next year, the Web-based system will allow users to compare current conditions with historical trends in order to provide an ongoing estimate of crop yield potential throughout the growing season.

Nick Phillips continues his work on the web-based Remote Sensing course, and has created several updates. These modules remain under development and will soon be available at: <www.geotree.uni.edu>.



A **UNI Campus Map** was created as an interactive online map that allows you to scroll to various areas of the campus, zoom in and out, and get detailed information on residential buildings, educational buildings, and parking lots. The new map also allows users to search for locations by building name and parking lots. It also has routing applications. To find out more, visit <http://itt240-02.geog.uni.edu/CampusMap.Default.aspx>. This web site was created and is maintained by the GeoTREE Center.



New GeoTREE Staff Members

Emily Boyd • Emily is a transfer student from Iowa Central Community College originally from Jewell, Iowa. She is an undergraduate student currently majoring in Graphic Communications, and is assisting with website designs along with the creation of graphics and logos for the GeoTREE Center. She will also assist in other web-related activities.

Jessie Puls • Jessie is a Computer Science graduate student. She will be working on the emergency response system utilizing GIS tools and work with routing information that will assist emergency responders with several options. Jessie is currently designing and developing a stand-alone software using Map-object and Java programming.

Justin Thomas • Justin is an undergraduate student from the Department of Geography. He is working on water quality monitoring using satellite data (Hyperion) for Clear Lake in Iowa. He is working closely with Nathan Green to develop a prediction model for water quality analysis.

Redesigned Web Site

GeoTREE's web site has been redesigned to accommodate easier navigation through the site. Check us out at:
<<http://www.geotree.uni.edu>>.



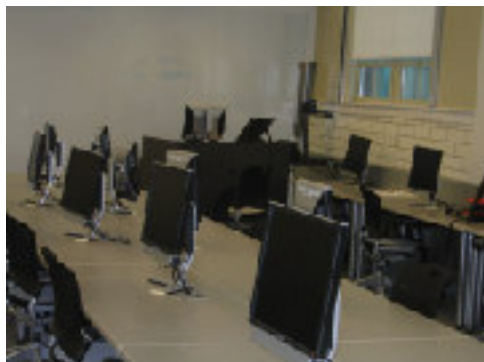
Upcoming Events

GeoTREE Staff	Event/Date(s)	Location
Presentation: J. DeGroot R. Sugumaran	EcoHealth ONE Conference October 7-10, 2006	Madison, WI
Presentation: J. DeGroot	ESRI Public Health Conference October 23-26, 2006	Denver, CO
R. Sugumaran	NRCS - Expert System & GIS for Conservation Planning - October 24, 2006	Dubuque, IA
R. Sugumaran	Environmental Health Mtg.-Environ. Habitat Analysis - October 25, 2006	Marshalltown, IA



The Department of Geography at UNI offers various educational opportunities including GIS Certificate, GIS science emphasis major at undergraduate level and MA in Geography. For further information regarding the Department of Geography, please contact Dr. Patrick Pease at: Patrick.Pease@uni.edu or by phone at 319/273-2772, or go to: <<http://www.uni.edu/geography>>

GeoInformatics Lab: A teaching lab with 25 brand new computers available for students and other faculty members at UNI. These computers are loaded with GIS software, (ESRI suite, IDRISI, AutoCAD, etc.), Remote Sensing (ERDAS Imagine, eCognition, Sub-pixel classifier, ENVI, etc.), GPS (Trimble Pathfinder office, AscPad, etc.). Please call to visit with us, or stop by to see our new facilities.



GeoTREE Center is housed in the newly remodeled Innovative Teaching & Technology Center (ITTC) on the UNI campus. Our Center includes over 1,000 square feet. The lab has "state-of-the-art" technologies that include 15 Dell staff computers with the latest multi-media, and two servers with gigabyte Ethernet connection.

- A 42" plotter has been added to the Center.
- Several GeoXT units are also available for use.