

Geographic Information Systems in Geology @ the University of Northern Iowa



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INTRODUCTION

The Iowa Geoscience Education Information Network (IGEIN), the University of Northern Iowa, the University of Iowa (Dr. John Dunkhase), the Iowa Geological and Water Survey (IGWS), the Iowa Limestone Producers Association (ILPA), and the Iowa Math and Science Education Partnership (IMSEP) seeks to engage Iowa's teachers and students in outdoor learning experiences through the use of traditional field experiences and geospatial technologies. Iowa has a great need for well-educated/employable geoscience teachers. There is also an increasing need for public awareness in Iowa regarding: global climate change, environmental sustainability, natural resource management, energy production/conservation, environmental national security, and the important role geoscientists play in addressing these issues. This project assists Iowa's teachers and students in constructing local landscape (geologic) experiences and integrating these traditional field experiences with hand held computing technology. All project components follow Iowa's newly mandated Iowa Core Curriculum and specifically address learning through inquiry and 21st skills.

The Iowa Geoscience Education Information Network (IGEIN)

An interactive website (www.exploreiowageology.org) has been constructed to facilitate data (geologic and geospatial) access for all learners to existing sources including the Iowa DNR GIS Database, Iowa DNR GEOSAM, USGS, the Corps of Engineers, and many more. Iowa specific geosciences curriculum and inquiry activities are available. K-12 (teacher and student) projects and landscape experiences are also being posted as they are developed. These products serve as staging points for Iowa's teachers to construct comparative investigations using data from across the state. The site also contains many interactive components including downloadable podcasts (audio & video) detailing the geology of Iowa. These virtual field trips are led by the Geological Society of Iowa (GSI), the Iowa Geological and Water Survey, and many other geoscience professionals from around the state. Iowa's teachers and students are using these podcasts to support their own scientific explorations. IGEIN@uni.edu

Digital learning – Hand held computing – Outdoors!

Geospatial technologies combine basic data entry (e.g. spreadsheets), GPS coordinates, and their related attributes to fully characterize the relationships between the natural world and the activities of our daily lives. This technology is becoming widely used in agriculture, military applications, city/state maintenance, education, and recreation. Geospatial kits (Trimble Juno SBs) are accessible through a check-out system to any Iowa (k-16) program. These kits are also accompanied by detailed instructions, suggested projects, and curriculum ideas.

Participant data are downloaded to an IGEIN server and made available as shapefiles (.shp) and Google Earth (.kml) layers. The goal is to initiate longitudinal investigations and sharing of local (campus, city park, state park) data between Iowa's k-12 schools.

In-Service and Pre-Service Teacher Development and Activities

The basic idea behind the IGEIN is to create a sustainable community of users that facilitates a cohesive link within geoscience education in Iowa and to encourage the development of place-based geology activities that promote scientific inquiry and the development of 21st century skills. Teacher development and support are an important feature that prepares teachers to use geospatial technologies effectively.

Pre-service and Geology Majors

Introduction to Geology – Earth Science teachers, majors, and non-majors

Vs

Inquiry into Earth Science – Elementary education majors

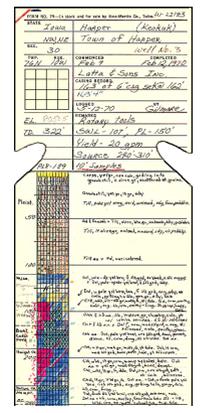


The IGWS & Geosam

This library represents an irreplaceable resource for the citizens of Iowa!

The total replacement value of the drill samples in the IGS Rock Library is over \$111.3 million.

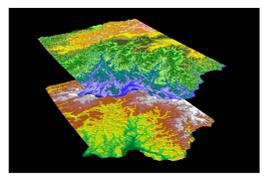
<http://gsbdata.igsb.uiowa.edu/geosam/>



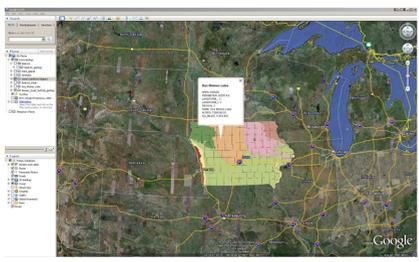
GEO-networking



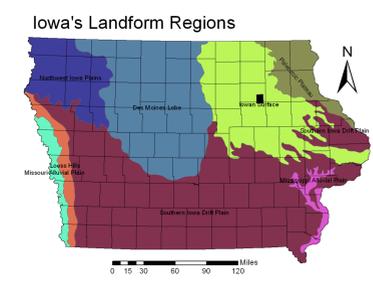
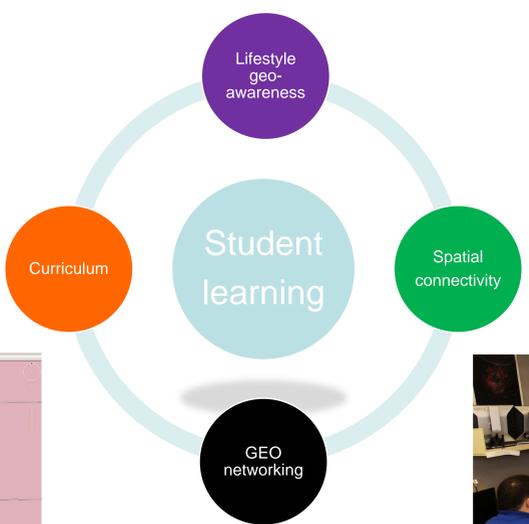
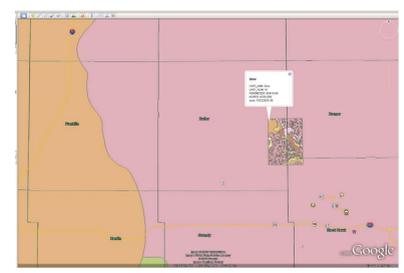
Geographic Information Systems



Podcasting (audio & video)



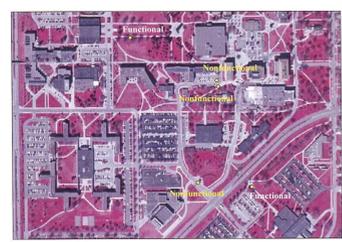
Google Earth



In-service

- K-12 teacher workshops have focused on –
- A) Hardware training (Juno SB)
- B) Software training (ArcGIS and ArcPad)
- C) Project development and geospatial applications

Functioning/Nonfunctioning Emergency Phones on the UNI Campus



Light Coverage of Sidewalks on the UNI Campus: Classroom vs. Dormitories

