

# The Importance of Spatial Concepts in the Geosciences

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After writing an article for last year's student-centered issue of *The Professional Geologist*, I felt compelled to follow up with a second contribution concerning the pathway geosciences is likely headed. Coming from the perspective of a classically-trained, field geologist, I have to swallow my pride as I realize it is becoming painfully more evident that the knowledge of spatial concepts and remote sensing is becoming ever more important in the geoscience curriculum. The age of geographic information systems (GIS) is here and it will not be fading away anytime soon like some passing pet rock fad. In fact, the use of spatial concepts across the higher education curriculum is spreading like a mid-summer wildfire in Yellowstone. Do not get me wrong – we should not throw away our geology hammers just yet... we may need them to use on our computer monitors.

While recently attending the annual Geological Society of America (GSA) Meeting in Salt Lake City, UT, I observed that even the AIPG exhibits booth was flanked by aerial photos in adjacent exhibits. Aerial photography and satellite imagery were everywhere in Salt Lake City; a sign that spatial awareness is crucial in the world of geology. Some of the largest (and most expensive) exhibits were devoted to spatial issues. Even the GSA booth gave away free satellite imagery posters. I probably should have expected this with the advent of Google Earth in 2005, but I had not fully realized how mainstream spatial concepts had become.

My point is this – whether going into the environmental industry, petroleum industry or any other field of endeavor, any geosciences student who wants to compete in the job market must have knowledge of GIS and spatial analysis. Indeed, more and more geosciences curricula are including GIS as a formal graduation requirement. Progress marches on and the future graduate better realize what potential employers are seeking.

As a geologist housed in a department of geography and environmental planning, I know about flexibility, but I also have some experience with technology and the tools of the trade. Elmhurst College is a progressive enough institution to want to prepare our students for gainful employment. We made the decision, after a one year feasibility study, to modify our curriculum to include the

important spatially-oriented coursework which our future graduates will need, instituting a minor in GIS, and delving into the world of the GIS Certificate Program.

A few years ago, a GIS Certificate Program would not have been a profitable venture, nor would it have been popular with geoscience students. It would have been reserved for those working professionals who were specialists in urban planning, demographics, or governmental concerns, and rightly so. However, today, not only does the GIS Certificate Program make sense, it is becoming more and more popular with current students of diverse areas of concentration, wishing to supplement their degree with some abilities in spatial awareness. Even K-12 teachers and community college instructors are incorporating spatial concepts into their curriculum and need training on using GIS techniques.

The Elmhurst College GIS Certificate Program caters to the working professional who does not desire to venture into a full-fledged degree program, but wants the convenience of a curriculum geared towards the lifelong learner. There are numerous well established post-baccalaureate programs that exist, including state-of-the-art and enormously successful Penn State Online Graduate Program. However, these types of programs require an undergraduate degree, thus excluding some of the potential interested parties. The Elmhurst College GIS Certificate Program, while not a degree program, assumes no undergraduate degree and requires only a high school diploma while being flexible enough to include working professionals and traditional college students. The five course program, consisting of three GIS courses and two Information Systems courses, can be completed in less than one calendar year and is presented in a "hybrid" format. Students receive innovative lecture material, readings, case studies, and exercises via an online course management system and meet face-to-face in a computer lab on the campus every other week during the evening hours for practical hands-on work. Armed with student trial version of the ESRI software and ESRI certified instructors at their beckon call, this format truly promotes a collaborative learning experience as students work collectively to learn the technology within a cohort model. In addition to the non-traditional student, the Program

accommodates traditional students wishing to supplement their degree with a GIS Certificate. The coursework is offered as a "for credit" option and used by traditional students as elective coursework. Non-traditional students may also apply the courses towards a future degree again as electives. Employers routinely reimburse for tuition under this program format and learners of all types thrive while realizing the diverse applications of GIS.

A new aspect to the Elmhurst College GIS Certificate Program will be the creation of two tracks: an entirely online Professional Track, designed for current GIS analysts and other spatial modelers, who have been working with GIS and wish to attain formal GISP certification (offered by the GIS Certification Institute (GISCI)), but currently lack the educational requirements for the certification; and the Educational Track, presented in hybrid format (meeting on alternate Wednesday evenings) and designed for K-12 educators wishing to learn more about incorporating spatial concepts into their curriculum. The Education Track is also appropriate for current students, since coursework may be applied towards college credit (as electives), who wish to supplement their existing major field of study with a GIS Certificate. The entirely online Professional Track will explore such topics as using Model Builder, constructing geodatabases, and facilitating the use of Python Programming, while being taught by certified ESRI Professional Instructors. It is designed to be a collaborative learning experience and brings together GIS workers from various locations to share skills and ideas.

For further information on either of these Program Tracks, please contact Dr. Rich Schultz, GIS Program Coordinator, at (630) 617-3128 or richs@elmhurst.edu or visit the Program website: <http://www.elmhurst.edu/~geo/GISCertProgram.html> for further details. The new format is expected to begin in 2006.

It may seem peculiar that a conventional field geologist is singing the praises of a virtual, and often remote, technology. Alas, with a lump in my throat, I declare that progress and technological advancements will ultimately win over ritual and classical geology... all for the good of the students and future geologists.