TeachGIS White Paper Number 2:
How to Talk to University Administrators about GIS

By Diana Sinton, Jon Caris, Niem Huynh, Meg Stewart

On most campuses of higher education, there are relatively few people who know about their institution's use of geographic information systems (GIS). Perhaps few would consider this as surprising, as GIS usually *first* falls into the educational domain of classrooms. Maybe GIS is the subject of stand-alone classes, as an application area of geography, the geosciences, planning, environmental studies, natural resources management, landscape architecture, computer science, etc. "Ancillary" and opportunistic use of GIS is increasingly common in other disciplines as well, including social sciences, humanities, public health, and professional schools. Thus, academic administrators are most likely to be aware of the ways in which GIS is part of an institution's educational mission.

At the same time, usage and deployment are expanding into areas where a range of other administrators reign: information technology, planning, facilities, basic and applied research, alumni relations, fundraising and development, institutional research, admissions, and athletics, among others. A 2011 survey of UCGIS institutions found that:

> The challenges are many, but one of the key points that respondents made repeatedly was the need to engage university administrators about the value of GIS. Many respondents felt that while faculty appreciation of GIS was stable or growing, administrators still saw GIS either as an income generator (fee for service operations) or as something that was a resource-hungry endeavor. Many of our respondents stated that they had more engagement with the outside community than within the university itself. Some respondents pointed out that the rise and fall of GIS depended heavily on the attitudes and experiences of administrators such as deans, provosts and chief information officers.

There is no single "right" way to manage, or teach about, or teach with, or talk about, or support GIS on campus. Every institution has its own approaches, strategies, culture, and desired outcomes in these regards. You may be the only person on your campus who even knows what GIS stands for, or at least it might feel that way, and you are responsible for every detail of its instruction, management, and support. Or, your institution could have multiple instances and versions of GIS being taught at any given time, and you may be part of a whole Center for GIS. Or, you might even aspire to a vision of "Enterprise" Campus GIS, like the University of Wyoming or Virginia Tech.

Whatever the size and scope of GIS is on your particular campus, being able to share ideas, concerns, and opportunities with your campus administrators can help address problems, avoid conflicts, and expand understanding.

First, Help Others Understand GIS

Undoubtedly one of the persistent issues about GIS is the fact that most people don't know what it is. Though this perception may never have been quantified (who has time to validate the obvious?), there is overwhelming anecdotal evidence for this as a valid starting point. So what are some ways that you can share information about GIS in a manner that will not overwhelm or further obfuscate? Sometimes a seemingly easy answer ("It's like Google Earth", etc.,) is a short-term solution but only serves to create more questions down the line ("That's fun, but why is it part of my budget and how is it supporting research and why would that be part of our general education program?").

A few suggestions are listed below, *in no particular order*. Most of us draw selectively from sources like these since aligning explanations with an audience's prior knowledge and interests is important. And even experts do not yet have one single best answer to this question.

Videos

1. The Geospatial Revolution Video Collection, produced by Penn State Public Broadcasting, is a great place to start, especially for people curious about 21st century technologies.
2. If you find that simple animations are helpful at explaining complex topics, you might like this What is GIS video, produced by Esri Ireland. Computerized accents always make things sound more authoritative too, especially when this one lilts between British, Irish, and Australian?
3. Another What Is GIS video, this time without the cartoons or the accent. Esri produced, and basic but effective.
4. An extra brief What Is GIS video, with clear articulation of words and a K-12 educator flavor.
5. From a FOSS4G Conference, a presentation on Defining a GIS (23 minutes), based on crowdsourcing definitions, via GIS functions, from a range of users and professionals. *Not* the *only* video to share with an administrator, but good food for thought can be found here.
6. Esri's Joseph Kerski, a member of their Education Team, has produced hundreds of GIS and geography videos available under his geographyuberalles name. This Discovering the World Through GIS is a general overview of geospatial-question-asking.

Writings

7. The *What is GIS?* article by Caitlin Dempsey at GIS Lounge manages to be both simple and comprehensive.

8. *What is GIS, a very brief description for the newly curious* (pdf), comes from the introduction to Understanding Place: GIS & Mapping across the Curriculum, edited/written by Diana Sinton and Jenni Lund (Esri Press, 2007).
9. Esri has been publishing its short essays on assorted GIS and geography topics as an ongoing series. The content within and across volumes varies greatly, but there is something interesting in each of these. Essays on Geography and GIS, Volume 1 , Volume 2, Volume 3, Volume 4, and Volume 5 (all pdfs).
10. This GIS Overview may be Esri's most succinct and non-jargon filled description.

You will quickly find, if you don't already live this every day, that it is not just GIS with which people are unfamiliar. It's geography as a whole. It pays to keep track of geography articles written for general audiences, like these from the Los Angeles Times, the Wall Street Journal, Science Careers Magazine, and the Guardian (by Michael Palin, no less!). The Association of American Geographers (AAG) also maintains information on What Geographers Do and Career Profiles. Their Spotlight on Geographers includes the types of stories that engage administrative audiences, like understanding how geography and other GIS-savvy students can become involved with new, lucrative fields such as business geography or precision wine-making, and become the New Geographers making a difference in the world.

Build Bridges & Connections

Given the nature of the technology, it is very likely that GIS may have a connection with, and be relevant for, a large and diverse set of people at your institution. Establishing and maintaining connections across campus may enable synergistic outcomes such as the sharing of software licensing fees, creating internships or work-study positions for students, and developing project ideas for classes. Somewhere, somehow, GIS is being used in virtually every office on a campus of higher education, *virtually* too as the internet and the "cloud" become more integrated into GIS workflows. Talking with administrators from these offices may work more smoothly if you first identify the areas where the GIS needs and opportunities overlap, and when you can provide examples and models of how their counterpart offices at other institutions are involved with GIS.

Often, managing GIS software and related data involves the offices of information technology services, academic computing, and/or perhaps the library. When deploying Esri software, your information technology office may appreciate knowing about system design issues and strategies (pdf), though such specifics do evolve rapidly. You can reach out to interested librarians on your campus to share stories from institutions where the libraries play a key GIS role, such as Stanford, UC San Diego, and Texas A&M. Maybe they will find inspiration and ideas within the American Library Association's Map and Geospatial Information Roundtable (MAGIRT). (For more on these particular types of connections, watch for TeachGIS.org's forthcoming White Paper on *Campus Models for GIS Support*.)

Offices of Service Learning and Civic Engagement are another campus connection for GIS. At places including DePaul University, the University of Memphis, Lesley University (Flash file), and Macalester College, GIS usage is integrated systematically into classroom experiences coordinated with service learning exchanges.

Facilities Management is an increasingly common place to find GIS activity on a campus. The University of Rochester and the University of Calgary are two schools using 3-d imagery for their campus planning efforts. Harvard, Vanderbilt, UNC Chapel Hill, the University of Georgia, the University of Massachusetts, and Western Kentucky University are just a few of the hundreds of campuses now utilizing GIS for campus management.

Are your alumni engaged and important? Spread the knowledge and keep them informed by leveraging the alumni magazine to feature a GIS story, as Binghamton University recently did. Washington College has a very active GIS program and highlights alumni success stories on their blog.

Find Common Ground

Sharing specific stories and ideas with individuals via their own familiar venues, platforms, and channels of communication is another effective means of communication.

Does your favorite administrator read *The Chronicle* regularly? Point them to GIS-related articles that they might have overlooked, like this one on WorldMap, or this one on Crisis Mapping, or this article on a GIS component to the problem-solving, interdisciplinary field of convergence science (subscription access required).

Is science research very important at your school? Suggest a GIS-related topic for a Sigma Xi lecture, such as this one on urban sprawl at Smith College, or feature GIS at a Sigma Xi student poster session, as Bucknell University recently did. Find stories from the GIS and Science blog that will be of particular interest and relevance to administrators on your campus. Is undergraduate research an important agenda item? A few years ago, the Council on Undergraduate Research dedicated one of their Quarterly publications to GIS across the curriculum (Table of Contents).

Maybe you have a provost who is particularly keen on the digital humanities? The *New York Times* has featured several articles on emerging mapping-related humanities' projects and historians delving into GIS. There is an on-going Spatial Humanities project at the University of Virginia, and scholars have published a Spatial Humanities book, one of several that exist. Send your provost a copy.

Or maybe the Dean is a computer scientist and very supportive of open source application development? Let them know about the emerging front of open source GIS tools, about how QuantumGIS and GRASS are more popular, user-friendly, and robust than ever before, and how developers are finding community on the GIS Stack Exchange. If you'd asked earlier, they may even have sent you to this year's FOSS4G Conference in Buenos Aires.

The professional organizations to which administrators belong have their own conferences and publications that provide chances to encounter GIS. Hearing from peers can be powerful, so don't overlook articles on GIS capacity building written by the National Association of College & University Business Officers (NACUBO). For your CIO and other technology-oriented administrators, you will find stories from EDUCAUSE, and even the American Association of Colleges & Universities (AAC&U) has a few items worth reviewing (from a search on GIS).

What You Might Want Them to Know

So, let's say you manage to get your favorite administrator to know a bit more about GIS, perhaps through some bridges you've built and common ground you've found. Now what? You have a few moments of his or her undivided attention. What do you want them to remember about the conversation?

GIS is not a passing fad. The use of this technology across society and the world becomes more entrenched, and necessary, with every passing year. Geospatial Technology is considered a "High Growth Industry" by the US Department of Labor, yet "the public is not aware of the necessary skill sets and competencies needed to prepare for the diverse career opportunities available within the geospatial technology industry." Federal, state, and local governments are the largest users of GIS software in the world, with active use in nearly every sector. Across the world, at least 10,000 higher education institutions have some sort of Esri license, and over 2,000 have education site licenses. Of the world's top 400 universities (as ranked by the Times of London), 95% have some sort of Esri license while about 85% have site licenses (D. DiBiase, personal communication). Currently, only 15 of the United States *do not* have, or are not currently seeking, statewide Esri licenses for free access of software to all of their K-12 public schools. Search for "GIS" together with one of its qualifiers (analyst, technician, manager, specialist, etc.) in job search engines and the results reflect the breadth of work types, skill sets, organizations, locations, and opportunities that GIS can enable. Plus, we recently made the top 100 list of CNN's Best Jobs in America, earning an "A" ranking for "growth" and "flexibility," though understandably a lower grade for "stress." Share that with your Career Services Office, and let them know they can also track the salaries of Professional, Scientific, and Technical Services Occupations that a geography major or GIS-competent person might pursue.

GIS is a must-have in some academic disciplines. It was once considered a competitive advantage, a strategic choice, or a marketing differentiator, but by now there are several disciplines in which basic GIS familiarity is essentially a given expectation for its graduates. These include environmental science, geography, geosciences, planning, landscape architecture, and natural resources management, among others. One site with career information about environmental science is explicit: "A knowledge of the Geographic Information System (GIS) and Global Positioning System (GPS)—a locator system that uses satellites—is vital." Is it realistic to expect mandatory coursework in every instance of the above mentioned curricula? Of course

not, but clever, job- and graduate-school seeking students are savvy when they know the demand and expectations exist.

Graduates are doing very cool and interesting things with GIS and related geospatial technologies. *Every* institution desires to have a ready set of success stories to share with their Board of Trustees, their website editors, their Admissions Office, their local Chambers of Commerce and newspapers, and their alumni donor pool. Calvin College, Miami University, Eastern Kentucky University, and Illinois State University all know this. Write up a few profiles of your own and you will undoubtedly find a receptive audience with your local administrators.

GIS supports teaching, learning, and spatial thinking. The notion that embedding GIS into learning experiences leads directly to improved learning outcomes will always be a challenge to prove, if for no other reasons than singling out GIS as the only independent variable is unrealistic, and deciding how to measure "learning" is equally problematic. High school seniors who take an in-depth, semester-long GIS course automatically used more spatial terminology to describe inherently spatial processes (when compared to non-GIS students); and middle school students who spent a year learning GIS had higher standardized test scores in reading than their peers, especially when they are English Language Learner (ELL) students; and GIS use among college students improved their performance on a Spatial Thinking Abilities Test (STAT), compared to those who have not studied GIS. Other measured outcomes include enhanced student attitudes and engagement with the content they are studying, which we expect to lead to deeper learning.

In spite of these findings, it is silly to consider GIS as a quick fix capable of solving student learning challenges in a classroom. But, when a tool fails to help its users reach a solution, or provide greater insights, or advance understanding, it is unlikely to stand the test of time. And so far, GIS is passing this test. This you can let your administrators know.

GIS usually has initial and ongoing maintenance costs. If your campus already uses or is planning to use Esri software, make sure that someone is knowledgeable about the licensing options available, and the benefits provided by some packages (pdf). For many schools, cooperative agreements among statewide systems and consortia dramatically lower costs. In any case, in this day and age, do not let the cost of software and hardware be considered your limiting factors. Numerous alternative software packages exist, and dedicated GIS computer labs are not a necessity. Instead, keep in mind that *maintenance* and *costs* also refer to the ongoing professional development for instructors, the time to solicit and supervise worthwhile internship opportunities, ongoing attention to excellent and effective GIS instructional practices, curricular revisions and possible alignments with professional standards, etc. It takes significant commitment and dedication for GIS to play any substantial role across an institution's teaching, research, and administrative profiles.

Being able to communicate effectively and creatively about GIS with your campus administrators (and colleagues, family, friends, and neighbors) may help create opportunities, reduce ignorance, and engender good will. That we know for sure.

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