

**Proposal: An affordable approach to supporting GIS**  
**Submitted to the NITLE Western Regional Advisory Council**  
**Instructional Innovation Fund Program**

**Abstract: The challenge and the approach**

GIS support has been a thorny problem for small schools: a few have made heavy investments in GIS, while others have made virtually none. The central question is whether or not to hire full-time GIS staff; as a result, there is almost no middle ground between an expensive program and no program at all. In a recent collection of articles on GIS at small institutions ([http://nitle.org/index.php/nitle/transformations/2006\\_5\\_1](http://nitle.org/index.php/nitle/transformations/2006_5_1)) there is a consistent theme: sustainable, effective GIS support is expensive. The sole article describing a program without a large budget ([http://nitle.org/index.php/nitle/transformations/2006\\_5\\_1\\_ross](http://nitle.org/index.php/nitle/transformations/2006_5_1_ross)) reports modest success but worries that the approach “may not even be sustainable”.

We believe that a sustainable middle path is possible, offering the benefits of GIS support and training on a small scale while avoiding the cost and risk of hiring full time staff. We propose what is in principle a simple and common step: outsourcing.

While outsourcing of technological services is hardly new, it is quite rare for schools to outsource support of technologically sophisticated academic undertakings. Our innovation is to develop a close partnership with a vendor specializing in GIS services, enabling an institutional commitment to supporting this highly demanding technical need at very modest cost. We believe that using this model we can have a substantial impact on the usability of GIS by faculty and students at liberal arts colleges. We have the support of faculty and administration to implement this model at Reed College. This proposal seeks funds to extend the model to partner schools to prove that the model is scalable, and to document and share the model so that it can be replicated elsewhere.

**Pedagogical objectives**

This program is designed to help small schools without formal GIS programs offer GIS services to their community at modest cost. The objective is not directly pedagogical but designed to improve capacity for pedagogy. The need for GIS as part of liberal arts pedagogy is well described in this excerpt from *Transformations*, May 1 2006:

“...computer-based mapping technology is no longer restricted to the domain of the natural sciences. Historians, economists, anthropologists, sociologists, political scientists, and even psychologists have discovered that...visualizing spatial patterns promotes and encourages inquiry-based learning by providing access to the data *behind* the pictures. GIS mapping supports the process of critical thinking.... GIS can be used to develop both community and global awareness, helping our students become engaged citizens.”

**Success factors**

Essential resources for a GIS initiative are hardware, software, training, support, and data. This proposal addresses these factors with an emphasis on a new approach to providing the resources most difficult and expensive to supply at small colleges: training and support. We describe a sustainable GIS program that is feasible at very modest cost. We seek funding to operate the program for the first year.

Hardware and software no longer present the major expenses they once did. Most modern workstations will run the industry standard ESRI ArcGIS package adequately for normal tasks. ArcGIS is already available at virtually every NITLE institution; ESRI makes licenses very affordable for educational institutions. As part of this proposal Reed will acquire such a site license and will make ArcGIS widely available, providing access both within our central computing lab and at various departmental computing centers. Schools with Windows-equipped computer labs can generally deploy the software with modest effort. Reed uses mostly Macintosh computers, and we have successfully prototyped the technology to make our Intel Mac computers into a highly functional, reliable dual-boot GIS stations.

Access to data need not be limiting. An ever-increasing number of data collections are available for free (though support may be needed to locate data, assess its quality and appropriateness for particular purposes, and prepare it for use). In addition, schools can often find large amounts of data at reasonable cost. For example, much regional data is available to local (Portland) scholars through the inexpensive RLIS Lite (<http://www.metro-region.org/index.cfm/go/by.web/id/593>). Membership of the Inter-University Consortium for Political and Social Research provides access to a huge amount of data at a cost of just \$2,000 per year; many NITLE schools are members.

The remaining factors, training and support, are where the gap lies. In schools with successful programs these elements are usually provided in-house by a staff GIS specialist, running a dedicated lab and offering consulting, training, support, and assistance with projects: an expensive proposition. Among those schools that have invested heavily is Vassar College; their program is described at [http://nitle.org/index.php/nitle/transformations/2006\\_5\\_1\\_cunningham\\_stewart](http://nitle.org/index.php/nitle/transformations/2006_5_1_cunningham_stewart)

Reed College exemplifies small colleges that have attempted to support GIS technology with minimal investment. We provide some software and hardware but, to date, each student desiring to integrate GIS analysis into their work has faced the burden of having to gather and evaluate resources for themselves, with no direct institutional support or expert guidance in sourcing data, developing analytical methodologies, or verifying results and conclusions. While some students have become highly proficient in GIS techniques and have completed valuable research projects, they have done so only with great effort and persistence—usually while leaning heavily on the volunteer efforts of a few alumni and friends with GIS expertise. This is neither a scalable nor a sustainable approach.

Each of these programs has had some successes; Vassar's approach is broad and scalable but expensive, while Reed's is virtually free yet produces a few success stories. Historically there has been virtually no middle ground between the two.

Is there a way to provide sustainable support that doesn't cost a mint? The need is real; in a well-attended recent meeting with Reed faculty and staff, there was broad agreement that, with better GIS support and training, both faculty and students would be much more able to capitalize on GIS technologies and to confidently integrate geospatial analysis into their research. But with only volunteer effort there is no good way to get there.

**A new approach**

There are many GIS consulting groups across the country that perform complete services, as well as training and support, for government and industry. We have developed a relationship with a local vendor, The Gartrell Group (<http://gartrellgroup.com/>), who provide GIS support services on retainer. They currently provide similar services to regional governments who need occasional access to GIS expertise exceeding what they have in-house. We have arranged for the Gartrell Group to participate in a structured approach to collaborate with Reed faculty, staff, and those alumni and friends who are already supporting GIS here to provide a suite of services; this proposal seeks to extend the same support to partner schools in order to demonstrate the program more widely and learn how to apply it in more environments. The program is made up of the following services:

*Getting Started Sessions*

We plan regular, widely advertised, drop-in introductory sessions. Here we will present a short overview of GIS – how it works, examples of how it has been applied in a variety of fields and disciplines, and how it might be used in research projects undertaken by students and faculty. We will encourage discussion and will provide a basic explanation of how to approach projects involving GIS. We will also assist in clarifying research questions and will direct participants in options and resources for obtaining further assistance. Funding from this proposal will pay for travel so that participants from partner schools can attend these sessions.

*Exploratory Meetings*

At these individually-scheduled private meetings we will focus on a single question and help the researcher formulate a feasible plan for integrating GIS analysis into their work. We will require a short application before these meetings. Applicants will need to clearly state what they want to gain from the consultation before the time will be allocated. Funding from this proposal will provide both travel funds and consulting time to extend this service to participants from partner schools.

At Reed, a small steering group of faculty and staff, with advice from a GIS expert, will assess (and assist with) proposals. As part of their involvement, we will require partner schools to create their own internal review mechanism to serve this role. Participants will be asked to rank their requests, and to meet periodic deadlines that will be published in advance so that requests can be considered in rounds.

*Project Planning*

Once a project has passed the exploratory state and is determined (through the review process local to each school) to be feasible, time will be allotted for planning and help desk services. Project planning sessions will provide intense focus on a single project to help the researcher identify specific resources and GIS techniques they will need to tackle their project, and to give the researcher enough direction and advice to collect necessary data, master necessary techniques, and start the project. Funding from this proposal will provide both travel funds and consulting time to extend this service to participants from partner schools.

### *Help Desk Services*

In addition to planning, approved projects will be given access to Help Desk services provided by the Gartrell Group so that they can quickly get support when they encounter technical difficulties. Funding from this proposal will pay for the consulting time to extend this service to participants from partner schools.

### *Unpaid residencies*

This is the only part of the proposed program that will be offered only to our partner institutions. We will award a small number of \$500 stipends to help defray costs for out-of-town participants to spend time in Portland while working intensively on GIS projects that will require consulting services. By alleviating concerns of distance, the residency program will help to model the environment that we expect schools will eventually be able to build for themselves.

### **How grant decisions will be made**

Once requests have passed institutional review, grants will be provided on a first-come, first-served basis as projects go through the system outlined above. As necessary we may apply the following limitations:

1. Based on demand, some funding may be reserved for rounds of awards that fall later in the year.
2. Effort will be made to use each school's internal ranking in order to avoid severe imbalance between participant schools.

### **Assessment**

We plan to track the success of the program carefully, measuring both the number of attendees and (through surveys) the impact on their understanding of GIS and their research projects. At the end of the first year we will survey more broadly (including all those who expressed interest in the program, whether or not they attended) in order to solicit feedback and to learn about barriers that may have prevented involvement or successful use of GIS resources.

### **Why has this never been done before?**

To the best of our knowledge, no model like this has been used for GIS support in higher education. (It has been used successfully by small local governments.) In fact, there are very few examples of outsourcing highly technical academic support functions. Small colleges in particular are somewhat notorious for “not invented here” syndrome. By demonstrating a successful partnership that outsources a complex, highly technical academic support function, we believe we can help pave the way for future opportunities not only in GIS but in other areas.

While existing relationships helped open the path for conversations (the principal, Bryce Gartrell, is a Reed alumnus) we do not believe that this is an essential aspect of the model; on the contrary, we wish to demonstrate that it can be successful—and enormously efficient—using any interested and qualified GIS consultant and paying market rates for services.

**Sustainability and dissemination**

This proposal focuses on affordability and cost-effectiveness. Because the objective of this work is to create an affordable model for GIS support, we expect that Reed and other NITLE schools will find internal funds to adopt or continue the program. This small-scale approach may be sufficient to entirely meet long term demand at some institutions; for others it may provide a cost-effective, low-risk entry path to building a GIS program which over time might grow to justify a program that includes full-time staff.

There is already an active GIS community within NITLE and we have no desire to reinvent that. But we do anticipate an active interest group of schools who embrace this model, and we expect to have ongoing community activities that we nurture using existing NITLE connections and resources such as MIV and Moodle.

We will share the results of this work broadly. First, we will document our experience with the model, including success factors and challenges, and publish this in venues where it will be available to institutions that might benefit from it. Possible venues for submission include NITLE events and media, EDUCAUSE regional and national conferences, the Consortium of Liberal Arts Colleges annual conference, and NWACC meetings or workshops. Second, we hope to continue to invite regional colleges to join into our program directly, rather than having to create a separate program on their own.

**Calendar**

*Summer 08:* purchase software, sign contract with vendor, prepare labs, plan and advertise Getting Started sessions, set up dates for rounds of grant applications, prepare assessment instruments and project application form.

*Fall 08:* Schedule at least four drop-in "Getting Started" sessions and advertise widely. Collaborate with faculty to offer introductory sessions tailored to specific disciplines and delivered during ordinary or specially scheduled class time. Solicit applications for further consulting and begin providing it.

*December 08:* Mid-project assessment. Survey participants and make necessary changes.

*Spring 09:* Continue with projects started in Fall and (budget permitting) continue to offer Getting Started classes and to solicit and serve new applications.

*May/June 09:* End of project assessment and final report.

**Participating Institutions & Participants**

**Lead institution**

Reed College: Ethan Benatan

**Partner institutions**

George Fox University: Greg Smith

University of Puget Sound: Alyce DeMarais

Lewis and Clark University: Dan Terrio

Willamette University: John Balling

**Other institutions that have expressed interest**

Pacific Lutheran University (not yet a NITLE member)