Collaboratory for GIS and Mediterranean Archaeology (CGMA) Project Report
July 2004 – June 2005
DePauw University
Drs. Pedar W. Foss and Rebecca K. Schindler, co-PIs

DePauw University received the Mellon Foundation grant for the CGMA (Collaboratory for GIS and Mediterranean Archaeology) Project at the end of March 2002. In the first two full years of the grant, we developed MAGIS (Mediterranean Archaeology GIS), the CGMA database and the web delivery system; and we developed and taught the CGMA undergraduate seminar. In AY 2004-2005, we continued to refine the structure of the database and the web delivery system, we conducted the seminar for the second time, we held our third board meeting, and we had several students collecting data on survey projects. Drs. Foss and Schindler contributed a book chapter on CGMA to a forthcoming ESRI publication[1], presented the CGMA project at an international conference on Roman Archaeology in Birmingham, England, and will be presenting a paper on CGMA at the 3rd International Conference on Ancient History in Shanghai, China.

The Undergraduate Seminar, Fall 2004

Dr. Kenny Morrell, Rhodes College, taught the second iteration of CGMA undergraduate seminar in fall 2004. This year eleven students enrolled in the course, three from DePauw University, and four each from Millsaps College and Rhodes College.[2] The class met twice a week for two hours and was taught using the Course Delivery System (CDS) developed by the ACS (Associated Colleges of the South) Technology Center. Dr. Morrell's syllabus followed the outline established by Dr. Foss in 2003, although he incorporated some more recent publications on archaeological survey and GIS. We originally designed the course with three components: introductory lectures on survey archaeology and GIS, a practicum carried out at each institution, and individual research on survey projects in the Mediterranean. Based on our experience in 2003 and feedback from the students and faculty, we decided that the individual research project was not an effective use of class time, so we dropped that component of the course in 2004. It was clear that through work-study and the summer research internships, there was ample opportunity to research survey projects for inclusion in MAGIS. At the middle of the semester we held the CGMA Board Meeting at Rhodes College.

Student feedback on the course remains positive.[3] Students particularly commented on the collaborative nature of the course. They enjoyed interacting with students and faculty from other schools; they found it refreshing to 'get outside of DePauw' and to encounter professors with different teaching styles. Students also appreciated the 'hands-on' nature of the course – they

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[1] Schindler, R., and P. Foss, "The collaboratory for GIS and Mediterranean archaeology (CGMA)," in Diana Stuart Sinton and Jenni Lund (eds), *Teaching & Learning with GIS in the Liberal Arts*, ESRI Press, Redlands, CA, forthcoming 2005.

[2] The College of Wooster did not participate in the seminar this year because Dr. Nick Kardulias was on sabbatical and was not able to supervise the students at Wooster.

[3] Since the course was not taught through DePauw this year, we did not have formal evaluations for the course. The comments here are based on interviews with the students. Next year we plan to develop an independent evaluation form that all CGMA students will complete.

were expected not only to participate actively in discussion, but also to work together to solve problems posed by the professor, and to design and implement their own survey project (the practicum). In 2003, Dr. Foss initiated the CGMA Cup competition, in which the professor posed questions and the students at each school worked together to earn points towards the 'Cup'. This friendly competition encouraged all students to engage with the course material and to work together as colleagues. Rhodes College has won the Cup both years, so the pressure is on the other schools for next fall.

Again this year a central component of the course was the practicum. Students on each campus worked together to design a survey project on their campus or in their town. They had to develop a database, collect GPS (Global Positioning Systems) data and other data from the field, and enter their data into a GIS (using ArcGIS software from ESRI). This year all the student groups chose to go off-campus for their projects. Millsaps studied one of the oldest cemeteries in Jackson, Mississippi. The Rhodes students, being in Memphis, Tennessee, chose to record Elvis locations around town. At DePauw, the students have begun building a historical GIS of the religious landscape of Greencastle, Indiana.

An added requirement for the course this year was a two-part take-home final exam. Dr. Morrell included this assignment in order to evaluate individual student accomplishment in the course. The first part of the assignment was a reflective essay on the practicum. For the second part of the assignment Dr. Morrell asked students to apply their knowledge of survey method and theory to one of two problem scenarios (see appendix 1). The students commented that this was a particularly useful assignment because it asked them to work on a potentially real-life problem.

Dr. Morrell has provided reflections on his experience with the CGMA course for inclusion with this report (see appendix 2).

Third Board Meeting, Fall 2004

This year we held our Board Meeting at Rhodes College in Memphis, TN. Participants in the fall meeting included four of the five CGMA faculty members (P. Foss, R. Schindler, M. Galaty, and K. Morrell), the students enrolled in the course, and board member H. Haskell from Southwestern University. This meeting provided us with the opportunity to reflect on and make improvements to the undergraduate course, to identify the most important goals for the CGMA databases and MAGIS, and to run a tutorial on ArcGIS for the students.

At the fall 2003 meeting, the students and faculty devoted their energies to determining the metadata fields necessary for MAGIS to be a useful research tool. Since then we had built a prototype of the database and had entered approximately 100 projects. Our concerns now became making the system accessible to various types of users, including the students and faculty involved with building CGMA, those who have conducted survey projects and want to enter data into the system, and those who use the database for research. Since the students had gained experience extracting metadata from survey reports and in entering the data into the prototype system, their feedback has been very valuable in modifying the database, revising the web-based entry pages, and developing help files for each part of the system. Survey projects employ a wide range of methodologies, and survey reports use different terminology for the same processes.

Our challenge is to account for those differences in our database structure and search options in the most comprehensive but efficient way. At the board meeting we discussed CGMA's potential value as a way of identifying methodological problems in survey archaeology as well as the regional gaps were survey research may be lacking.

In the afternoon, Dr. Foss led the students through a tutorial on ArcGIS, so that they would have enough background to use the software for their practicum projects. Dr. Schindler met with the other members of the board. Much of that discussion focused on the undergraduate seminar and the student involvement with the CGMA project. All faculty members expressed an interest in providing on-going archaeological experience for the students, as well as getting the students from the various schools together more than once a semester. Ideas raised included developing a joint project on an archaeological site, getting CGMA students involved with ongoing or new survey projects, sending a team of students with a faculty member to collect survey information available only from local resources (such as the regional *soprintendenza* offices in Italy). We also discussed the ways we might improve the technical aspects of the course, particularly the communication between campuses. Students and faculty alike are pleased with the CDS; barring unforeseen problems, they like the streaming lectures and the chat feature for communicating with each other and with the professor. In 2004, because there were only three campuses involved, it was not difficult for Prof. Morrell to set up a conference call between the campuses and put everyone on speaker phone (although he did not do this all the time). While video conferencing seems a logical next step, we are not sure that the benefits would warrant the expense and the technical issues. Prof. Morrell, however, suggested the possibility of using audio technology similar to that used for radio call-in shows during which multiple lines can be fed into one broadcast. This is something to look into for the future.

Finally, we began to discuss our long-term goals for CGMA and the undergraduate seminar after our current grant runs out. We all agree that the CGMA seminar has been a valuable addition to our curricula in Classical Studies, Anthropolgy/Archaeology, Geosciences, and Computer Science and we would therefore like to ensure that we continue to offer the course beyond the four years of the original grant. We also are considering the possibility of opening up the course to other institutions (although we would have to proceed carefully with this).

The Meta-database and Programming

We are continuing to run the CGMA system on an Apple Xserve (named Hecataeus). Beth Wilkerson continues to serve as the CGMA programmer; she was assisted again in AY 2004-2005 by a student intern, Alex Iliev.[4] Prior to June 2004, our programming efforts focused on the development of the database. While we continue to refine and test the database structure, energies have shifted to the development of the data search pages and to building MapServer on a Macintosh platform so that we can develop our spatial search page.

Having essentially completed the meta-database at the end of AY 2003-2004, our summer interns in 2004 entered data for over 100 projects (primarily in northern Europe, Italy, and

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[4] Alex was hired through ITAP (the Instructional Technology Associates Program) at DePauw University.

Greece). We now have information for 149 projects as this summer's research interns begin their work. The students also helped us test both the data entry page (reserved for CGMA staff to enter data directly into the database), and the data submission page, which allows outside researchers to enter data about their own projects. Data entered through the data submission page is saved on the server but we have the opportunity to check it before it is uploaded to the primary database. Both entry options ask users to sign on so that we have a record of who entered the data.

In AY 2004-2005, our student intern, Alex Iliev, worked primarily on developing the search pages for CGMA. We are very pleased with the interface that he and Beth Wilkerson created. It functions elegantly; the search options are flexible yet the design makes the page easy to use. (see appendix 3). We are still testing the search pages, but plan to make them available by early fall 2005.

Our second major goal this past year was to implement the GIS aspect of the CGMA project, i.e., our spatial search functionality. In order to do this, Ms. Wilkerson had to figure out how to get MapServer, the open source cartographic application we are using, to talk to MAGIS, our database. This took some time because, although MapServer works on a Macintosh Platform, Ms. Wilkerson could find no examples of it being used on an Apple Server and then served over the web. Yet now, at the end of AY 2004-2005, she has successfully made MapServer and the spatial search pages work on our development machine. In summer 2005, she plans to upload the code to our server and to start testing the spatial search functions (see appendix 4) on that machine.

The major programming for MAGIS is almost complete. In AY 2005-2006 we need to fine-tune and clean up the code and test the databases and the search pages. We have already had inquiry from John Peterson, a professor in the School of Computing Sciences at the University of East Anglia in the U.K., who saw the CGMA paper at the Birmingham conference; he has asked about using MAGIS code for a European Union GIS project on cultural parks (see appendix 5). This indicates that other scholars see our structure and approach, not just our content, as having significant value. As we indicated in our initial grant, and following Mellon guidelines, we do plan to release our development code to the scholarly community when it is clean and ready.

In fall 2005, we will have a new student through DePauw University's ITAP program, whose primarily responsibility in the fall will be to test all aspects of MAGIS. In order to properly test the system, we will need to have enough spatial data entered. This is one aspect of data collection that has proved difficult, as many survey publications do not include specific coordinates, or they include maps with no geo-referencing. Getting coordinates for the projects already entered is one task on which our summer interns will focus in 2005 (see below).

Student Work

We originally established three ways in which undergraduate students could contribute to building CGMA: research projects as part of the CGMA seminar, work-study positions in the spring semester, and internships during the summer. In AY 2003-2004, students took advantage of all three opportunities. This past year, however, we decided to drop the individual research projects from the CGMA seminar (see above). In the spring semester 2005, we had two students

from DePauw University work on the project; no students from the other schools were able to do it. For summer 2005 we have also hired two interns from DePauw University and none from the other schools.[5] We are considering why it has been difficult to recruit students from the other schools to work on the project and how we might handle this better in the future. In part, it is a matter of supervision; we would prefer that all summer interns come to DePauw to work together on the project, so that supervision and integration of student work functions smoothly, but not all students from other schools are able to make that commitment.

Student work in the spring and early summer 2005 has focused on filling out the meta-data for projects already entered into the database (in particular we have focused on Greece, for which we had a very complete list of projects but many of the entries lacked specific data). For each survey project, students begin by checking the internet for a project website – this often provides much of the data we need, as well as further bibliography. As a next round of searching the students check the electronic databases available through our libraries, this includes WorldCat (for books), JSTOR, and DYABOLA (the on-line subscription database of the Deutsche Archaeologische Institut in Rome). Articles and books that are not available locally or full-text on-line are obtained through Interlibrary Loan. As mentioned above, a particular challenge has been determining the geographical coordinates of the survey projects. Few publications include this data outright, and although many include maps depicting the survey boundaries, many of those plans lack coordinates. The students can, however, scan the maps, scale them and overlay them on a base map in ArcGIS to determine the approximate longitude and latitude. For surveys for which boundary data is entirely lacking, we will at least determine a point within the survey area to use as a geographic anchor for MAGIS.

Our goal for the student work this summer is to have the records for Greece, Italy, and Northern Europe as complete as possible. If they should finish with that, we will move on to North Africa.

Conference Presentations and Publications

In March 2004 we presented CGMA at the American Association of Geographers conference in a session on 'Teaching GIS in the Liberal Arts' organized by Diana Sinton of NITLE. This resulted in a book chapter, "The collaboartory for GIS and Mediterranean archaeology (CGMA)," in Diana Stuart Sinton and Jenni Lund (eds), *Teaching & Learning with GIS in the Liberal Arts*, ESRI Press, Redlands, CA, forthcoming 2005. On 1 April 2005, we also presented a paper on CGMA at TRAC – Theoretical Roman Archaeology Conference, in Birmingham, England. The paper was well received; we made many connections with archaeologists doing survey in England and in Eastern European countries such as Romania, where much work is being done, but results are not yet widely disseminated.
In August 2005 we will present a paper at the 3rd International Conference on Ancient History in Shanghai, China. This will present an opportunity to discuss CGMA's potential with historians.

Budget

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[5] One student from Millsaps and one from Wooster expressed initial interest, but those positions did not work out. No one from Rhodes was able to take the position.

In the past year our primary expenses have been the salary for Ms. Wilkerson, the student internships in the summer of 2004, the salary for Dr. Morrell to teach the CGMA seminar, and the board meeting in fall 2004. When necessary, we upgraded some of our system software; we purchased no major equipment in AY 2004-2005.

Valerie needs to fill in the rest. Graph below is from last year, please update.

Collaboratory for GIS in Mediterranean Archaeology
Award Amount: $197,000

Category	Total Budget	2nd Year Expenses	Total Expenses	Matching	Balance
Faculty Members, Student and Personnel Support	$150,000.00	$39,886.07	$66,223.09	$2,665.32	$86,442.23
Workshops and Travel	$38,000.00	$2,040.18	$4,300.01		$33,699.99
Equipment and Space	$9,000.00	$2,196.26	$27,342.43		-$18,342.43
Totals	**$197,000.00**	**$44,122.51**	**$97,865.53**		**$101,799.79**
Interest Earned Through May 31, 2004		$1,658.98	$3,865.84		$3,865.84
Total Remaining					$105,665.63

List of Appendices

1. Take-home final exam from the CGMA seminar, fall 2004.
2. Letter from Dr. Kenny Morrell of Rhodes College, professor in charge of the CGMA course for the fall 2004.
3. The MAGIS search page.
4. The MAGIS spatial search page.
5. E-mail from John Peterson expressing interest in the CGMA code.

Appendix 5. E-mail from Prof. John Peterson in the School of Computing Sciences at the University of East Anglia, U.K.

From: jwmp@cmp.uea.ac.uk
Subject: MAGIS website
Date: 12 May 2005 09:17:21 EST
To: pfoss@depauw.edu

Pedar,

It was great to see you at Birmingham.

As I may already have said, I am involved with a European collaboration (COST A27) that wants, among other activities, to set up a database, linked to a GIS, holding information about cultural parks in Europe.

I was very interested in your presentation, and particularly in the possibility of using some of the software that you have been using, basing the COST A27 database on a structure similar to the one that you are developing, and using some of your code, which you suggested you could ultimately make available.

It would also be helpful to know what timescale you have in mind for implementation and when designs and code might be available to others.

best wishes

John