# Final Report of the

# Geospatial Technology Task Force

A Report To:

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Science, Technology, Engineering, Mathematics, Health, and Human Services
James Madison University

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**Introduction**

In 2006, a National Research Council committee was charged with determining how Geographic Information Systems (GIS) might be incorporated into existing standards-based instruction across K-12 curricula and how age-appropriate GIS curricula might be developed. Ultimately, the committee reported that these questions could not be answered before addressing the educational role of spatial thinking itself. The committee therefore set about learning "Why do we *need* to support spatial thinking across the … curriculum? Why should we invest in better GIS or any other support tools?" (p. 230, "Learning to think spatially" http://books.nap.edu/openbook.php?record_id=11019&page=230).

The NRC committee concluded that spatial thinking is fundamentally important, at the same time that it is "not just undersupported, but underappreciated, undervalued, and therefore underinstructed" (p. 230). The committee also concluded "Spatial thinking is not an add-on to an already crowded school curriculum but a missing link across the curriculum" (p. 232). The NRC committee's first recommendation was "Through the support of federal funding agencies..., there should be a systematic research program into the nature, characteristics, and operations of spatial thinking" (p. 232).

The NRC committee reached this conclusion, in part, after describing research that documents how few Americans (6-21%) are capable of correctly installing a car safety seat. They noted, in part, "The problem is not simply one of comprehension as a function of word complexity, sentence length, and therefore, verbal literacy. Comprehension is a function of another form of literacy, one that is equally essential but largely overlooked. Spatial literacy lies at the heart of spatial thinking" (p. 50). They go on to observe "Spatial thinking is so deeply embedded in the activities of daily life and thought that it is difficult to disentangle and appreciate its role. We may not even realize its role, but it is fundamental to many taken-for-granted activities, underpinning their successful performance and sometimes accounting for their spectacular failure" (p. 50).

In February of this year, Dr. Jerry Benson charged a task force to survey JMU's current capabilities in using GIS in teaching and scholarship and to make recommendations that would lead to strengthening our capabilities in offering courses and other learning opportunities that use GIS as a tool (Appendix A), as well as building scholarly opportunities. While the primary focus was to be on STEM-related programs, the information gathering and analysis have included the entire campus when possible. The initial title of the task force related to

geographic information systems (GIS), but we have used the phrase geospatial technology (GT) to capture the broader nature of how the technology has evolved.

The geospatial technology task force (GTTF) developed an online survey (Appendix B) that was broadcast via email to the JMU Faculty and Administrators email distribution list. Analysis of the survey results revealed that there were two groups of respondents: 1) existing users of the technology, and 2) people who were interested in using the technology. The GTTF attempted to contact all of the existing users of the technology via email, phone and in person in order to solicit additional information based on questions we had developed (Appendix C). After discussing these responses, we developed a different set of questions and attempted to contact all of the people who had been identified as being interested in using GT in the future (Appendix D).

The report presents an overview of the survey responses, summarizing our findings on teaching, research, and infrastructure (training, support, access to technology and data). The recommendations include a suggested sequencing of future activities, as well as specific tactical (short-term) and strategic (long-term) recommendations.

**Survey Results**

*Demographics*

A survey of JMU faculty regarding their current use and future interest in use of GT was conducted using Qualtrics. Participation was voluntary and most likely from those interested in or educated about GT.

Of the 61 survey respondents, 34 currently use GT in at least one of the areas: teaching, scholarship, other. An additional 18 respondents do not currently use GT but are interested in their use in at least one of the three areas. These 52 respondents are summarized in Tables 1, 2 and 3. The nine respondents in Table 1 that selected “other” for current use reported: real estate research, camps, graduate student use, personal (two respondents), outreach, APRS, professional development, and parent relations website. The three respondents in Table 1 that selected “other” for future interest reported: outreach/public information, Alternative Break program, special collections houses oral history collections from a geographic area that would be helpful and interesting to map interactively.

The majority of respondents are in the College of Arts & Letters (CAL), College of Integrated Science & Technology (CISAT), and the College of Science & Mathematics (CSM). All units other than the School of Engineering (SoE) are represented in the initial survey results.

TABLE 1: Respondents could select multiple categories among teaching, scholarship and other

| Current Use or Future Interest | Response |
|---|---|
| Teaching | 23 |
| Scholarship | 20 |
| Other | 9 |
| I do not currently use geospatial technology but am interested in future use in: | |
| Teaching | 16 |
| Scholarship | 6 |
| Other | 3 |

TABLE 2: College or School affiliation of respondent.

| College or School | Response | % |
|---|---|---|
| College of Arts and Letters | 15 | 25% |
| College of Business | 2 | 3% |
| College of Education | 4 | 6% |
| College of Integrated Science and Technology | 22 | 36% |
| College of Science and Mathematics | 14 | 23% |
| College of Visual and Performing Arts | 2 | 3% |
| Graduate School | 1 | 2% |
| School of Engineering | 0 | 0% |
| A.P. Faculty | 1 | 2% |
| Total | 61 | 100% |

TABLE 3: Rank of the respondent.

| Rank | Response | % |
|---|---|---|
| Assistant Professor | 15 | 25% |
| Associate Professor | 12 | 20% |
| Full Professor | 19 | 31% |
| Instructor | 7 | 11% |
| Lecturer | 2 | 3% |
| Adjunct or Affiliate | 5 | 8.5% |
| A.P. Faculty | 1 | 1.5% |
| Total | 61 | 100% |

All further analysis uses the 52 respondents who reported current use or interest in future use. Detailed survey responses for these respondents are included in Appendix B.

Teaching and scholarship are the primary current use areas; teaching is the primary future interest area (Table 4). The majority of faculty who currently use these technologies are in

CISAT, CSM and CAL although CoB, CVPA and A.P. faculty are also represented. The majority of faculty who do not currently use these technologies but are interested in future use are in CISAT, CSM and CAL although three faculty in CoE are interested in using GT in teaching. Descriptions of the "other" categories are in the first paragraph of this section.

The number of years respondents have worked at JMU are summarized in Table 5.

TABLE 4: Summary of affiliation, rank and future or current use areas for respondents.

| | | Current Use | | | Future Interest | | |
|---|---|---|---|---|---|---|---|
| | | Teaching | Scholarship | Other | Teaching | Scholarship | Other |
| College or School | College of Arts & Letters | 5 | 3 | 1 | 4 | 3 | 1 |
| | College of Business | | | 2 | | | |
| | College of Education | | | | 3 | | |
| | College of Integrated Science & Tech. | 10 | 10 | 3 | 4 | 1 | 1 |
| | College of Science & Mathematics | 8 | 7 | 1 | 5 | 2 | 1 |
| | College of Visual & Performing Arts | | | 1 | | | |
| | Graduate School | | | | | | |
| | School of Engineering | | | | | | |
| | A.P. Faculty | | | 1 | | | |
| | **Total** | **23** | **20** | **9** | **16** | **6** | **3** |
| Rank | Assistant Professor | 9 | 9 | 2 | 2 | 1 | 1 |
| | Associate Professor | 3 | 3 | 1 | 5 | 3 | |
| | Full Professor | 6 | 5 | 3 | 5 | 2 | 1 |
| | Instructor | 3 | 2 | 1 | 4 | | |
| | Lecturer | | 1 | | | | |
| | Adjunct or | 2 | | 1 | | | 1 |

| | Current Use | | | Future Interest | | |
|---|---|---|---|---|---|---|
| | Teaching | Scholarship | Other | Teaching | Scholarship | Other |
| **Affiliate** | | | | | | |
| **A.P.** | | | 1 | | | |
| **Total** | **23** | **20** | **9** | **16** | **6** | **3** |

TABLE 5: Number of years worked at JMU by respondents

| Number Years at JMU | Frequency |
|---|---|
| 0-4 | 11 |
| 5-9 | 14 |
| 10-14 | 11 |
| 15-19* | 8 |
| 20-24 | 4 |
| 25-29 | 2 |
| 30-34 | 1 |
| 35-39 | 1 |

* includes one response of 17+

Follow-up interviews were conducted with a subset of the 50 named respondents who currently use or have interest in future use of GT as well as a subset of individuals suggested by the survey respondents as being interested in GT in some area. All survey results that follow refer to the results of the follow-up interviews rather than the initial survey.

*Teaching*

Faculty from multiple colleges are teaching the use of GT and teaching with GT to cover concepts and theories of their discipline. Twenty-eight faculty (CISAT 15, CSM 12, CAL 1) indicated they are using GT in their courses. At least 12 courses emphasize the tool as the focus of the course; however, this is difficult to pin point especially with higher level courses that appear to be a combination of teaching the tool and teaching with the tool. The audience for GT courses is primarily majors within each discipline, with the exception of GenEd courses and some of the IdLS courses. Of the 28 faculty that currently teach with GT, 17 want to upgrade the GT content of their courses, either by increasing GT coverage, or including collaboration with other GT faculty. The types of uses varied from strictly visualization, to queries, and complex spatial analyses. Virtually all of the courses identified through the discussions have been undergraduate courses, though there have been informal discussions between various faculty on campus about graduate level courses and programs.

*Research and Other Uses*

Existing and identified possible research and other uses cover a broad spectrum ranging from discipline specific research, to outreach and publicity, to emergency management. Details are captured in the survey results (Appendix B).

*Infrastructure*

The survey and follow-up discussions identified several areas where the existing infrastructure that facilitates and supports the use and teaching of GT could be enhanced to increase the use of GT. These include new and ongoing training opportunities, better technical support, better awareness of and access to existing technology, expansion of available technology, and opportunities for faculty to network with each other.

JMU currently participates with other state universities in the yearly acquisition of university-wide site licenses from Environmental Systems Research Institute (ESRI), the producer of the most widely used geographic information systems (GIS) software. The license covers a suite of desktop and server applications and allows for academic and administrative uses on university as well as faculty and student owned computers (with certain restrictions). While the license applies to the whole university, the cost has been handled by CISAT, and the limited support has come from one person in CISAT Lab Operations, Chris Rothgeb, who has additional responsibilities. Chris and Dr. Helmut Kraenzle are authorized to contact ESRI for technical support. Chris also maintains a website (http://esrilm.cisat.jmu.edu) that provides instructions and access to the ESRI software, but the site may not be known outside of CISAT since several people indicated in our survey and follow-up discussions that they did not know what software was available to them. The primary desktop software from ESRI, ArcGIS, is currently installed on over 200 computers across campus according to CISAT Lab Operations, which maintains the installation media and license managers for the software.. . The software may also be installed in other department-specific labs. GS faculty have previously had discussions with East Campus Library staff to see about installing the software in the library, but while the library staff is very interested in doing so, they did not feel it was appropriate to offer software that they could not provide any technical support. Options for technical support such as standard hours staffed by student interns were discussed, but nothing has been put into place.

Google Earth is a free geobrowser that allows for the visualization of georeferenced data on top of an image of the Earth. The software is installed in all labs, classrooms, and lecture halls maintained by TSEC, in HHS 0101 and 02010, as well as in Memorial Hall 3245. The software may also be installed in other department-specific labs. Other specialized geospatial technology software (e.g. GPS related, satellite image processing) are installed in HHS 0101 and 0201, and similar packages may be installed in other specialized labs around campus.

A need was also identified for better awareness of existing data on and off campus, as well as methods for faculty and students to share their data. The themes of data used at JMU are very diverse and include human and physical characteristics. The spatial scale and geographic extent of ongoing projects range from very local scales, including portions of the Shenandoah Valley, to global scales.

**Geospatial Technology "Lessons learned" at Other Institutions**

The committee contacted a number of individuals at institutions with well-regarded GIScience programs. These included

- David DiBiase, the faculty coordinator of the Penn State Department of Geography's GIS post baccalaureate certificate and master's degree programs and
- Sean Bennett, the Director of Undergraduate Studies and a member of the Department of Geography at SUNY Buffalo.

These individuals were asked, "If you had to build your geospatial program all over again, what might you do differently?"

Penn State's DiBiase noted that it is extremely difficult to incorporate GT across a curriculum, although he thought JMU's reputation for undergraduate curricular innovation would be an important institutional strength upon which any GT initiative should capitalize. He pointed to the University of Redlands Learning Spatially program as a great example of the cross-disciplinary use of GT. At the same time, DiBiase noted it is difficult to build a successful certificate/post baccalaureate program; the University of Redlands also has a highly regarded post-baccalaureate program. In fact, Penn State's GIS certificate program has recently been recognized by the Sloan Consortium as the 2009 Most Outstanding Online Teaching and Learning Program. Because either avenue represents a considerable challenge, DiBiase thought it might be especially challenging for JMU to attempt to do both simultaneously. DiBiase commented that either way an institution proceeds, however, will benefit from the upcoming release by the US Department of Labor's Employment and Training Administration of a final Geospatial Technology Competency Model (GTCM; http://www.workforce3one.org/view/5001001347919999153/info), which will identify core competencies that every worker in GT industries—including our own JMU undergraduates—will need to know or be able to do. Finally, DiBiase has done research on formal and informal quality assurance mechanisms specific to Geographic Information Systems (GISs) and GI Science (GISci) educational programs, which might provide some important quality benchmarks as GT use expands at JMU.

Sean Bennett at SUNY Buffalo commented that GT bridge both the social and physical sides of geographic thinking, providing a common denominator, and therefore a potential means for broad incorporation across curricula. GT can link C.P. Snow's "two cultures"—the sciences and the humanities—and could therefore become a common language that might catalyze lasting solutions to the world's problems. Bennett noted that a fundamental challenge to broader acceptance and use of GT at his institution, despite its cross disciplinary potential, is the absence of a 100-level course to serve as a gateway to the technology. His department is currently working on this gap in the curriculum. If he were to do it all over again, he would introduce GT much earlier and across a broader range of courses, even if it were only one extra credit project at a time.

At the University of Virginia, where there is no geography program, geospatial technology is used in a variety of academic programs across campus (e.g. environmental science, planning, and history). A major resource for facilitating the use of GT, at least in research, is the Scholar's Lab (http://www2.lib.virginia.edu/scholarslab/), which is housed in the library. The lab has 2 GIS specialists in addition to web developers and programmers. The lab also has graduate student consultants who assist patrons, and a graduate student fellowship program where graduate students from different programs across campus are hosted by the lab to work on projects in the digital humanities.

**Recommendations**

Our recommendations fall into two categories: tactical (short-term) and strategic (long-term). We also feel that the sequence of activities is important so that a broad network of people are included as activities go forward, so that support keeps up with the expected growing demand, and so that best practices can be established and disseminated to maximize the use of GT in teaching and scholarship at JMU.

*Tactical*

T1. While strategic in nature, one of the first things that should be done is the establishment and dissemination of standards and best practices for developing, documenting and sharing geospatial projects, data and derivative products. The Geospatial Technology Competency Model (GTCM) provides an important starting point for GT "best practices."
T2. Promote general awareness of GT and its current uses on campus and in the region.

a. Use the Fall 2010 Visiting Scholar's lecture by Dr. Michael Goodchild, known as the "father of Geographic Information Science," to promote awareness of technology and its uses around campus.
b. Systematically disseminate information about existing and planned availability of software and online training available to campus; however, ensure that the existing CISAT Lab Operations staff are able to handle potential increase in demand for ESRI software.
c. Have a GT Summit for on-campus users to meet, discuss their work, explore opportunities to collaborate and build the momentum to address the strategic issues below. While a number of GT users are aware of some of what's going on, we discovered in developing this report that no one had the complete picture.
d. Create a website or database of expertise/interests that faculty could use to find potential collaborators. This could be part of a larger spatial@JMU website that becomes the central portal to find out about access to software, related courses and programs, etc., or a public or secure web site with volunteered information about faculty interests and expertise.

T3. Work with CIT and CFI to develop additional faculty/staff training and development opportunities in the use of the GT software. The GoogleEarth Sandboxes are a good start, but much of the available GT software requires more structured training (a number of our task force members and other JMU faculty could provide this training). A regular request from faculty using (and those that would like to use) GT was for more in-depth training.
    a. Consider establishing a fellows program where JMU faculty could be given course release time (one to three courses/academic year) to reside part-time at the CIT or CFI to offer one-on-one consultations with interested faculty.

T4. Consider funding GT software centrally and increasing the range of software and also access sites on campus. Our surveys show that these software packages are used across colleges, and extensively in both the College of Science and Math (Geology and Environmental Science and Biology) and the College of Integrated Science and Technology (ISAT, including Geographic Science). To date, ISAT/GS has borne the budgetary brunt of providing the software.

T5. Develop additional technical support resources to support GT use on campus. At present, we have a single staff member with some expertise in this area (and additional duties aside from supporting GT use). Additional technical support will help minimize faculty/student frustration when software issues arise. It will also allow prompt response to installation/upgrade requests. Technical support is needed in the areas of

applying the technology as well as setting up and customizing the software on the desktop and on servers.

T6. Develop and support a GT data warehouse/server to give faculty/staff/students a repository for local data they produce and an easy way to share data produced or acquired for use in classes, student projects and research. Many individuals across campus use a variety of data sets, but most of it is locally held and not accessible to others. The GS program in ISAT has requested a 10TB disk array from next year's ETF that could provide an initial storage space for this effort. More capable servers to host the disk array may be needed to serve the entire campus.

T7. Invite speakers from campuses with strong cross-curricular GT efforts, such as University of Redlands, to come to JMU and share their experiences and consult with us on how we might enhance this capability on campus.

T8. Consider developing a Spatial Advisory Board to assist JMU with future efforts. Existing JMU contacts/alumni could be used to create the initial advisory board:
    a. Sam Nixon (Bachelor of Business Administration, 1980) CIO for Virginia, sits on Virginia Geographic Information Network Advisory Board (VGIN) with task force member James Wilson (state university representative).
    b. Stephen Lowe (Bachelor of Political Science),Geospatial Information Officer, US Department of Agriculture
    c. Kevin T. Gallagher (B.S. Management Information Systems), Associate Director for Geospatial Information and Chief Information Officer, U.S. Geological Survey

T9. Consider funding membership in the University Consortium for Geographic Information Science (UCGIS, http://www.ucgis.org/) to broaden awareness of JMU at the national level and to provide JMU faculty and students an opportunity to network with major players in the GT domain. The UCGIS has contacted task force member James Wilson to encourage JMU to consider applying for membership. Dues for the first year are $4,000 and subsequent annual dues are $2,000.

*Strategic*

S1. Form a task force to explore how GT could be infused across the curriculum, especially in General Education. This task force feels that GT is a key component of contemporary analysis in many disciplines and that our students must exit JMU and enter the workplace with more than a passing (or no) acquaintance with the affordances of these technologies.

S2. Consider adding a spatial thinking learning objective to General Education. This learning objective could be met in a variety of different ways, but having a specific objective will catalyze thought and action.

S3. Form a task force to build on existing interest and efforts to explore how GT could be infused across some of the graduate curriculum and possibly develop a graduate certificate or a full graduate level program.
S4. Any effort to more broadly infuse GT is going to require considerable faculty development and curricular resources. Many of those resources could be developed and packaged for use on-line, offering us an opportunity to thoughtfully explore how to build this capacity for JMU students, faculty and staff.
S5. Create and support a Center for GT on campus. This center would provide an opportunity for faculty and staff with teaching and research interests in GT to share those interests, identify collaborators and pursue funding and projects (we feel that the external funding climate in this area is very strong). This Center will also provide opportunities for students to develop valuable experience in working with faculty on projects and it will be a "one stop" shop on campus for anyone seeking GT-related advice. The Center could also have a supply of specialized equipment (e.g. GPS units) for use by faculty and students across campus.
S6. Consider promoting Shenandoah Valley as a showcase regional "hot spot" where science, policy & education are all coming together through and for the use of GT to address regional issues. Could involve universities, K-12, local – federal government, local citizens, and businesses.

**Conclusion**

The use of GT across campus is diverse and growing. Continued and expanded use will likely occur with no additional centralized effort, but building synergies between efforts and assisting faculty in appropriate and non-duplicative efforts would be bolstered by some type of university-wide coordination.

**Appendix A: Invitation and Charge from Dr. Jerry Benson to task force members**

The use of GIS has become ubiquitous and it is being introduced and used across many academic programs here at JMU. As the result of discussions with the involved deans and selected academic unit heads in the Science, Technology, Engineering and Mathematics (STEM) area, we felt it would be worthwhile to empanel a task force charged with inventorying and analyzing the use of and instruction of GIS in selected academic programs toward the end of making recommendations that would strengthen our coverage and use of this technology. I would invite you to serve on this task force.

**Charge:** Make recommendations that would lead to strengthening our offerings and capabilities in offering courses and other learning opportunities that use GIS as a tool.

- The task force will inventory and analyze the coverage/use of GIS within current academic programs/courses and faculty/student research toward the end of making recommendations that would strengthen our offerings and capabilities. For example, are there instructional opportunities whereby faculty expertise could be shared, the learning experience might be enhanced by having students from various academic programs in the same class, efficiencies could be gained, or new offerings and learning experiences may better address our learning goals?
- How might we use the opportunities created by strengthening our offerings and capabilities regarding GIS as a means to make connections and initiate discussions that would lead to enhanced collaboration.
- Are there specific technology recommendations in terms of hardware, software and training?
- While the primary focus of the task force will be within the STEM area and the composition of the task reflects STEM programs, the task force may have recommendations that involve other fields/programs given the wide use of GIS.

## Appendix B: Survey Responses

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 1 | Tracey Kite | A.P. | | 3 | Parent Relations Web site | | |
| 2 | Becky Holmes | CAL | Adj/Aff | 17+ | camps | | Used science on a sphere as an activity for a music camp. |
| 3 | Carrington Petras | CAL | Adj/Aff | 8 | T | | Google Earth is good for orienting geography-challenged students - in virtually any subject. I have used it to help make students aware of places and the relationships of different places in discussions of politics and wars in the ancient world. |
| 4 | Nicholas Swartz | CAL | Asst | 1.5 | T/S | | |
| 5 | Dr. Nikitah Imani | CAL | Assoc | 14 | T/S | | I teach the basic course in Spatial analysis for the sociology department and supervise various student projects that are derivatives from that. I also use GIS in research on the human environment and environmental science. |
| 6 | Julie Solometo | CAL | Asst | 7 | T/S | | I am an archaeologist and use GIS and GPS to locate and manage inventories of archaeological sites. It can also be used to look at the spatial relationships among sites and at the relationship of site location to environmental features, such as arable land. I have used GIS to predict site locations, aiding in survey for new sites. / I teach a course (ANTH 410) called Spatial Analysis for Anthropologists, which teaches students to ask and answer spatial problems using ESRI's ArcGIS. The course includes some archaeological applications, but also includes exercises that fall under the categories of cultural anthropology, sociology, and political science. / GIS is increasingly in demand among archaeologists (as well as in other disciplines), so I think this is an important skill to teach to |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| | | | | | | | our undergraduates. |
| 7 | Allegra Coe | CAL | Adj/Aff | 3 | Teaching | | I might consider using geospatial technology in my GWRTC or Lit courses, if the material would call for it. |
| 8 | Jo Anne Brewster | CISAT | Full | 18 | one of my grad students is using it in his practicum experience | | One of my grad students is doing a practicum for a local police department, specifically to help them to develop a program for using this technology in tracking crime activity. I have not used the technology myself, but would like to understand it better so that I might be able to assist the police department after the student graduates (time permitting, of course). |
| 9 | Jeffrey Tang | CISAT | Asst | 4.5 | personal | | I am interested exploring such technologies for my work in promoting renewable energy and energy efficiency, though other members of our team may pursue this part of our efforts. |
| 10 | George Baker | CISAT | Assoc | 10 | S | | I use geospatial technology to map the geographic coverage of nuclear weapon effects |
| 11 | Arch Harris | CISAT | Full | 25 | S | | I have created a database that overlays campsite data on digital or topo maps of Quetico provincial Park (Canada). |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 12 | Patricia Higgins, | CISAT | Lect. | 2.5 | S | | We are working on a project that will allow a map to display information about a country or region over time. |
| 13 | David Wenos | CISAT | Full | 20 | S | | Used GIS for mapping campus and developing DukeQuest with Mike Deaton |
| 14 | Cindy Klevickis | CISAT | Full | 16-20 | T | | My students are future elementary teachers. We do GeoCache activities as part of some of the IDLS classes. |
| 15 | Susan Conaty-Buck | CISAT | Instr. | 5 | T | | GIS to track health and illness |
| 16 | Carole Nash | CISAT | Instr. | 20 | T/S | | I have been using high accuracy GPS and GIS in archaeological and geographic field work since 1999 and taught GPS at JMU for five semesters. I have overseen four capstone projects (Geographic Science) focues on GPS. |
| 17 | Prof. David Bernstein | CISAT | Full | 10 | T/S | | I develop algorithms and data structures for use in geospatial software. |
| 18 | Maria Papadakis, | CISAT | Full | 16 | T/S | | Both my research and teaching uses GIS technology specifically, and I will also use google earth to help students visualize course topics, etc. |
| 19 | Amy Goodall | CISAT | Asst | 5 | T/S | | Used in Geography classes and in research projects abroad and locally. |
| 20 | Jack Gentile | CISAT | Full | 26 | T/S | | I'm a geographer. That's what we do. |
| 21 | Zachary Bortolot | CISAT | Asst | 3 | T/S/Outreach | | My research and teaching focus on geospatial technologies, particularly remote sensing. I am especially interested in environmental applications of high spatial and high spectral resolution remotely sensed data. I have also completed the paperwork to make ISAT part of the VirginiaView remote sensing research and outreach consortium. |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 22 | Wayne Teel | CISAT | Assoc | 10 | Teaching | | Currently I primarily use Google Earth in teaching geography classes, and occasionally have students using GPS in their research, though I am not particularly conversant in this myself. |
| 23 | William Tucker | CISAT | Full | 10 | Teaching | | I have an environment lab session that introduces students to use of GPS instruments and in a later session they use them to document georaphically the locations of their sampling sites. |
| 24 | David Fordham | CoB | Full | 18 | APRS | | I use the GPS in conjunction with the Automatic Position Reporting System to track mobile stations for public service events, emergency communications support, etc. and in conjunction with Jonathan Miles of CISAT have maintained an APRS digipeater on the wind energy tower. |
| 25 | Val Larsen | CoB | Assoc | 10 | personal | | I use gps for personal travel and aviation. While I don't use it in my teaching, it is relevant to my subject area as its use becomes more prevalent in business. |
| 26 | Anna Courtier | CSM | Asst | 2 | T/S | | Google Earth and Ground Penetrating Radar software |
| 27 | Heather Griscom | CSM | Asst | 4 | T/S | | I use it to spatially map the distribution of trees in my research. In my upper level forest ecology class, I use GIS to map out plot locations for group research projects. |
| 28 | Eric Pyle | CSM | Assoc | 5 | T/S | | Use Celestia for showing planetary geology, climate patterns, etc. |
| 29 | Christine May | CSM | Asst | 2 | T/S | | I currently use GIS and GPS data in research, and Google Earth in teaching. I am interested in having greater training opportunities (including short courses) for faculty and students (especially graduate students and undergraduate researchers) for use in geospatial tools. I am also interested in using LiDAR data for research. |
| 30 | Gabriel Niculescu | CSM | Asst | 6 | T/S | | |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 31 | Steve Whitmeyer | CSM | Asst | 5 | T/S | | I use ArcGIS and ArcPad in our summer Geology Field Course in Ireland (GEOL 399), and I use Google Earth modules in GEOL 110, GEOL 210 and GEOL 365. / / I have had 4 research students working on building interactive geologic maps and educational modules in ArcGIS and more recently in Google Earth. This work is ongoing and is funded by the NSF. |
| 32 | Cindy Kearns | CSM | Inst. | 20 | T/S/Professional devlopment | | teaching - in general education science classes & labs. Used to help students understand plate tectonics and landform development / / scholarship - used for field work and presentation of gps location data / / professional development - used for course work presentations and papers |
| 33 | Michael Renfroe | CSM | Full | 23 | Teaching | | I use this Google Earth in two courses to show students environmental features and countries of origin of agricultural products. |
| 34 | Jeff Showell | CVPA | Full | 6 | real estate research | | |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 35 | Tracy Harter | CAL | Asst | 4 | No current use | Special Collections houses oral history collections from a geographic area that would be helpful and interesting to map interactively | Special Collections in Carrier Library houses manuscript, print, and audio material that helps document the Central Shenandoah Valley. One oral history collection in particular, the Shenandoah National Park Oral History Collection, is currently being reformatted for digital access, potentially with transcripts also. It would be helpful for this collection, and potentially for other collections, to be more visually mapped and to help researchers make connections between content here and its physical provenance. For the SNP, it would be nice to map out the former homestead locations of these folks. There may be other uses for the technology also-- [i.e., a researcher asks: what materials do you have that help document the transportation industry [or business, or farming]? It would be interesting to document locations of, say, the Houck Tannery, Quick's Mill, Long's Store [3 locations in Rockingham county], the Henkel Press, etc. etc.] |
| 36 | Charles Blake | CAL | Full | 18 | No current use | T | In some instances, it would be useful re: helping students visualize the dynamics of urbanization, deforestation, and other topics. |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 37 | Scott Vollum | CAL | Asst | 5 | No current use | T/S | I have, for some time now, been very interested in incorporating GIS and mapping into my research. Specifically, the examination of social-structural factors in examining violence, crime and criminal justice constructs is of interest to me and I would love to be able to add a mapping/GIS technology to my repertoire in both analysis and presentation. Related to this, it would be great to be able to use mapping for visual presentation of some material to students when teaching (for example, I am currently teaching a class on the death penalty and we discuss the state and local variation of a variety of factors related to the administration and use of the death penalty--GIS/mapping would allow me to show these data in an interesting visual manner). |
| 38 | Kevin Borg | CAL | Assoc | 10 | No current use | T/S | I am interested in using GIS and/or Google Earth to store and diplay historical information (maps, images, social data) for Harrisonburg and to incorporate that information into my public history workshop course. |
| 39 | Gabrielle M Lanier | CAL | Assoc | 12 | No current use | T/S | My research has focused on historic buildings and landscapes, and I have done a lot of work with architectural and landscape resources and historic preservation. I would be very interested in learning more about potential applications. |
| 40 | Dusty Krikau | CISAT | Adj/Aff | 4 | No current use | Alternative Break Program | Currently use Google Maps to show where all of the Alternative Break Trips have been and will be going. Will potentially need to use it as students drive to destinations and become less and less adept at reading maps... |
| 41 | Joe Marchal | CISAT | Full | 15 | No current use | T | I would use examples of geospacial based collections, e.g. a spread sheet or dBase to illustrate various issues. |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| 42 | Emil Salib | CISAT | Full | 5 | No current use | T | Remote access and control of Geospatial sources |
| 43 | R. Ann Myers | CISAT | Full | 37 | No current use | T/S | locating pockets of specific human issue/health concerns may drive solutions |
| 44 | Pamela Hamilton | CoE | Instr. | 10 | No current use | T | |
| 45 | Melinda Burchard | CoE | Instr. | 6 | No current use | T | I saw another university present how they used Geo Caching activities to have small groups go out on campus and tag what they found that fit specific instructional components in sort of a scavenger hunt with two layers. The first step was the small groups finding the items, taking a photo and identifying the specific latitude and longitude. The second step was going out and finding the items tagged by another group. It reinforced the skill of geo caching plus doubled groups finding items that met the instructional components of the course. In their example, for Engineering, students were finding evidence of universal design in campus buildings. |
| 46 | Susan Barnes | CoE | Instr. | 8 | No current use | T | supporting primary grade students in constructing their own sense of space and to develop mapping skills |
| 47 | Mark Mattson | CSM | Asst | 11 | No current use | T | I'm interested in the concept of "Deep Time" in teaching and I thought evidence of continental drift would be a good way of |

| | Contact Info | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship) | Future Interest Area (T=Teaching, S=Scholarship) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|---|
| | | | | | | | conveying some of that. |
| 48 | Herb Slade | CSM | Instr. | 5 | No current use | T | I would like to investigate ways to use geospatial technology results to illustrate the use of relevant mathematics concepts I am teaching. I would also like to illustrate my physics courses with similar applications within the course subjects. |
| 49 | Jim Herrick | CSM | Assoc. | 12 | No current use | T/S | I find it interesting and potentially useful (plus I just dearly love maps of all kinds). I would be very interested in finding out how I might use such technology. Am particularly interested in shorter learning curve technologies. |
| 50 | Bill Ingham | CSM | Full | 34 | No current use | T/S/outreach/public information | After spending a few minutes one evening playing with Google Earth online, I have recently attended a presentation by Steve Whitmeyer and D. Lee Beard on an upcoming training opportunity through CIT. Just yesterday I submitted an application for that training. / / Specifically, I am interested in using Google Earth (and possibly other geospatial technologies) to add a visual dimension to teaching (whether formal and informal) of history (especially James Madison's life and times) and of the history of science. |
| 51 | | | | | No current use | T | I know next to nothing about it |
| 52 | | CISAT | Assoc | 15 | No current use | T | |

**Appendix C: Follow-up Questions for Geospatial Technology Users**

- What is your background with geospatial Technologies (GT)?
    - Which tools have you used?
    - How much experience?
    - How did you learn about GT?
        - Self-taught vs. Formal education
- Educational Use
    - Do you use GT for educational purposes? if yes, then...
        - In which courses do you use GT?
            - What is the primary topic of the course?
            - Who is the audience for the course?
                - Majors vs. non-majors
        - What is the purpose of including GT?
            - Teaching the tools
            - Teaching with the tools
        - Which tools?
        - How much do you &/or students use it?
        - Are there other courses (existing or new) where you would like to use the technology?
- Research
    - Do you use GT for research purposes? if yes, then...
        - What is the focus of your research where you use GT?
        - How do you use GT in your research?
        - Which tools?
- Data
    - What data are you using?
    - Who developed it?
    - What is its spatial scale? (local, regional, national, global)
    - What specific geographic areas are you examining
- Future
    - What's needed in order for you to continue using GT in your teaching or research?
    - What would enable you to do more?
- Can you identify other schools that might serve as a role model for the use of GT across the curriculum?
- Any other thoughts?

**Appendix D: Follow-up Questions for People Interested in Using Geospatial Technology**

- General Plans
    - How do you know about Geospatial Technologies (GIS, remote sensing, mapping)?
    - Do you anticipate your primary use of Geospatial Technologies to be in teaching or in research?
- Educational Use
    - Is there a specific course you are considering for Geospatial Technology use?
        - What is the topic of the course?
        - Who is the audience for the course?
        - What would be your goals in including Geospatial Technologies?
            - Teaching tool usage?
            - Teaching with Geospatial Technology tools?
- Research
    - Is there a specific research project you are considering where Geospatial Technology use would be beneficial?
        - What is the focus of your research?
        - How do you anticipate Geospatial Technology could help you reach the goals?
- Data
    - What is the spatial scale that you are interested in?
        - Local/regional/national/global
    - What data do you anticipate collecting or analyzing?
- Future
    - What assistance would you require to implement usage of Geospatial Technology in your teaching or research?

## Appendix E: Follow-Up Question Responses From Current Users

This information is divided into 5 Sections: Demographics, Background, Teaching, Research and Data, and Future

*Demographics*

| Name | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship, O=Other) | Future Interest Area (T=Teaching, S=Scholarship, O=Other) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|
| Benzing, Tom | CISAT | Prof | | S | T/S | |
| Bernstein, David | CISAT | Full | 10 | T/S | | I develop algorithms and data structures for use in geospatial software. |
| Bortolot, Zachary | CISAT | Asst | 3 | T/S/Outreach | | My research and teaching focus on geospatial technologies, particularly remote sensing. I am especially interested in environmental applications of high spatial and high spectral resolution remotely sensed data. I have also completed the paperwork to make ISAT part of the VirginiaView remote sensing research and outreach consortium. |
| Brewster, JoAnne | CISAT | | | | Research | |
| Conaty-Buck, Susan Beth | CISAT | Instr. | 5 | T | T | GIS to track health and illness |
| Deaton, Mike | CISAT | Professor | 16 | T/S | T/S | |
| Goodall, Amy | CISAT | Asst | 5 | T/S | T/S | Used in Geography classes and in research projects abroad and locally. |
| Higgins, Patricia | CISAT | Lect. | 2.5 | S | T/S | We are working on a project that will allow a map to display information about a country or region over time. |
| Klevickis, Cindy | CISAT | Full | 16-20 | T | | My students are future elementary teachers. We do GeoCache activities as part of some of the IDLS classes. |
| Kolvoord, Bob | CISAT | Professor | 15 | T/S/Outreach | T/S/Outreach | |

| Name | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship, O=Other) | Future Interest Area (T=Teaching, S=Scholarship, O=Other) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|
| Kraenzle, Helmut | CISAT | Professor | 14 | T/S | T/S | |
| Nash, Carole | CISAT | Instr. | 20 | T/S | | I have been using high accuracy GPS and GIS in archaeological and geographic field work since 1999 and taught GPS at JMU for five semesters. I have overseen four capstone projects (Geographic Science) focues on GPS. |
| Papadakis, Maria | CISAT | Full | 16 | T/S | | Both my research and teaching uses GIS technology specifically, and I will also use google earth to help students visualize course topics, etc. |
| Tucker, Gene | CISAT | Full | 10 | Teaching | | I have an environment lab session that introduces students to use of GPS instruments and in a later session they use them to document georaphically the locations of their sampling sites. |
| Wilson, James | CISAT | Asst | 22 | T/S | T/S/O | |
| Brent, Robert | CISAT | ASST | 1 | S | T/S | S |
| Luerssen, Remy M | CISAT | | 1 | O | O | |
| Tang, Jeff | CISAT | ASST | | T/S renewable energy | T/S | |
| Teel, Wayne | CISAT | ASSOC | 8 | T/S | T/S | |
| Krikau, Dusty | Community Service Learning | | | Alternative Break Program | | |
| Cocking, Dean | CSM | | | | | |

| Name | College | Rank | Years at JMU | Area of Current Use (T=Teaching, S=Scholarship, O=Other) | Future Interest Area (T=Teaching, S=Scholarship, O=Other) | Elaborate on Future Interest or Current Use |
|---|---|---|---|---|---|---|
| Courtier, Anna | CSM | Asst | 2 | T/S | | Google Earth and Ground Penetrating Radar software |
| Flint, Billy | CSM | | | | | |
| Gobetz, Katrina | CSM | | | | | |
| Griscom, Heather | CSM | Asst | 4 | T/S | | I use it to spatially map the distribution of trees in my research. In my upper level forest ecology class, I use GIS to map out plot locations for group research projects. |
| Hartshorn, Tony | CSM | Asst | 1 | T/S | T/S | |
| Hudy, Mark | CSM | | | | | |
| Kastendeik, Jon | CSM | | | | | |
| Kearns, Cindy | CSM | Inst. | 20 | T/S/ Professional devlopment | T/S | teaching - in general education science classes & labs. Used to help students understand plate tectonics and landform development / / scholarship - used for field work and presentation of gps location data / / professional development - used for course work presentations and papers |
| Leslie, Steve | CSM | Full | 4 | T/S | T/S | |
| Ludwig, Patrice | CSM | | | | | |
| Renfroe, Michael | CSM | Full | 23 | Teaching | | I use this Google Earth in two courses to show students environmental features and countries of origin of agricultural products. |
| Wiggins, Bruce | CSM | | | | | |
| Showell, Jeff | CVPA | Full | 6 | real estate research | | |

*Background*

| Name | College | What is your background with geospatial Technologies (GT)? | Which tools have you used? | How much experience? | How did you learn about GT? | Self-taught vs. Formal education |
|---|---|---|---|---|---|---|
| Benzing, Tom | CISAT | | | | Self taught | |
| Bernstein, David | CISAT | | Developed for ArcInfo, used TransCAD and MOSS | 20 years | | Undergrad Geography major but that predates most computer tools, Masters in Public Affairs and PhD in Urban Planning; self-taught with the tools |
| Bortolot, Zachary | CISAT | | ArcGIS, IDRISI, ERMapper, ERDAS Imagine, PCI, ENVI, Python | He took his first remote sensing class as an undergrad | Undergrad work in Geology and PhD in Forestry - used a number of these tools in his dissertation | |
| Brewster, JoAnne | CISAT | Current graduate students are using GIS | | | Through students | |
| Conaty-Buck, Susan Beth | CISAT | | None | None | She uses guest lecturers in her class, incl. Kolvoord | N/A |
| Deaton, Mike | CISAT | | ArcGIS primarily | 4 years | | self-taught |
| Goodall, Amy | CISAT | Graduate School. Post-doctoral Research | Arc Info, Arc GIS, Erdas | Dissertation, Post-Doc, other projects | Grad school | Formal |

| Name | College | What is your background with geospatial Technologies (GT)? | Which tools have you used? | How much experience? | How did you learn about GT? | Self-taught vs. Formal education |
|---|---|---|---|---|---|---|
| Higgins, Patricia | CISAT | | ArcGIS, Tableau | 3-4 yrs., but limited experience | A couple of short classes, but mostly self-taught | |
| Klevickis, Cindy | CISAT | | GoogleEarth and GPS units | Not much | | Self-taught - help from Remy Luerrsen |
| Kolvoord, Bob | CISAT | | ArcGIS, IDRISI, custom RS/image processing software,DNRGarmin,ArcGlobe, ArcScene | 22 years | PhD work used remote sensing/image processing | Combo formal/self-taught |
| Kraenzle, Helmut | CISAT | | All | 25 years of experience - telecomm industry and higher ed | Formal Education - Diplome in Geography and PhD in Natural Sciences | Formal education |
| Nash, Carole | CISAT | | Survey-grade GPS, ArcGIS | 11 years w/GPS and 5 years with ArcGIS | | ESRI online courses for GIS training; Training class with Trimble for GPS |
| Papadakis, Maria | CISAT | | ArcGIS | Last 4 years - limited experience | | Self-taught |
| Tucker, Gene | CISAT | | Surfer (Contour ploter), GPS units | 6-8 years | | Self-taught |
| Wilson, James | CISAT | | ArcGIS suite, ArcGIS Explorer, Google Earth, older technologies | 25 years | | both |

| Name | College | What is your background with geospatial Technologies (GT)? | Which tools have you used? | How much experience? | How did you learn about GT? | Self-taught vs. Formal education |
|---|---|---|---|---|---|---|
| Brent, Robert | CISAT | ArcGIS | 5 years | Agency posotion | | |
| Luerssen, Remy M | CISAT | ArcGIS, Google Earth | several years | | formal, grad school | |
| Tang, Jeff | CISAT | | | | | |
| Teel, Wayne | CISAT | Google Earth, GPS | | | Self taught | |
| Krikau, Dusty | CSL | | Google Earth | | | |
| Cocking, Dean | CSM | | ArcGIS, ArcExplorer, GPS, Google Earth | limited | | self-taught, sat in on GEOG 366 |
| Courtier, Anna | CSM | intro | GPR Slice, GPS, GE, GMT (seismology software) | 1 yr with GE, 5+ yrs with GMT | | self |
| Flint, Billy | CSM | | ArcGIS, GPS, Google Earth, National Geographic TOPO maps | limited | | self-taught, sat in on BIO 457 |
| Gobetz, Katrina | CSM | | ArcGIS, GPS, Google Earth | limited | | self-taught, plus on-the-job training |
| Griscom, Heather | CSM | | ArcGIS, GPS, Google Earth | limited | | self-taught |
| Hartshorn, Tony | CSM | limited | GPS, GE, ArcGIS | limited | | self |
| Hudy, Mark | CSM | | GIS, GPS | extensive | | self-taught |
| Kastendeik, Jon | CSM | | GPS | limited | | taught by mentor |
| Kearns, Cindy | CSM | intro/intermed | GE, GPS | 3 yrs, 10 yrs | | self |

| Name | College | What is your background with geospatial Technologies (GT)? | Which tools have you used? | How much experience? | How did you learn about GT? | Self-taught vs. Formal education |
|---|---|---|---|---|---|---|
| Leslie, Steve | CSM | some arcgis training, lot of work with hardcopy and digital maps (CAD), gps | arcgis, cad, gps, GE | minimal,proficientx2 | mainly self, sat in on GIS course as fac | |
| Ludwig, Patrice | CSM | | GPS, Google Earth | limited | | taught by mentor |
| Renfroe, Michael | CSM | | ArcGIS, GPS, Google Earth | limited | | self-taught |
| Wiggins, Bruce | CSM | | ArcGIS, GPS | moderate | | self-taught, sat in on GEOG 366, GEOG 466, and GEOG 385 |
| Showell, Jeff | CVPA | | ArcGIS, GPS, Google Earth | limited | | self-taught |

*Education*

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzing, Tom | CISAT | | | | | | | | | | |
| Bernstein, David | CISAT | Special topics classes - students develop GPS NAC structure; he also teaches spatial data structures in the data structures class | See above | CS majors | | | Development | | Non-commercial tools - typically developing new tools | | Interested in a class with CS and GEOG students exploring the underlying technologies |
| Bortolot, Zachary | CISAT | GEOG 216, GEOG 385, GEOG 485, GEOG 465, GEOG 210 | GEOG 216 - Remote Sensing and GPS, GEOG 385 (Remote Sending I), GEOG 485 (Image Processing), GEOG 465 (Forest Inventory); GEOG 210 (Physical Geography) | | Mostly GS majors in all these classes, even 216 which is 2/3's majors | | All classes but GEOG 465 and GEOG 210 | GEOG 465 and GEOG 210 | PCI Geomatic, ArcGIS, DNRGarmin | All semester | Not at present |
| Brewster, JoAnne | CISAT | | | | | | | | | | |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Conaty-Buck, Susan Beth | CISAT | NSG 460/HHS 460 - Healthcare Informatics | Survey of Healthcare Information technologies to support practioners and patients | Nursing and a variety of other HHS majors | | | | Exposing the students to the variety of tools in Healthcare informatics | GoogleEarth and GIS | One assignment | She is interested in epidemiology (for both grads and undergrads |
| Deaton, Mike | CISAT | GEOG 230 | Spatial thinking and analysis | | Mostly GS majors, a few ISAT and a few business majors | | Yes | Yes - class is evolving with new GS curriculum and he's anticipating doing more teaching with the tool | ArcGIS | Entire term | Spatial Epidemiology |
| Goodall, Amy | CISAT | Geog340, Geog470 | Biogeography | | Majors | | | Teaching with ArcGIS to study things liek range boundary changes | ArcGIS | 2-3 labs | Sure |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Higgins, Patricia | CISAT | Co-teaches IA-342 w/Kolvoord, but limited other teaching - she'd like to do more | Data Visualization | | IA majors | | | Teaching with the tool | ArcGIS and Tableau | Limited use | Intelligence Cycle |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Klevickis, Cindy | CISAT | GSCI 151 and GSCI 166 | Science Processes and the Environment | Future Elementary teachers | | | Giving students example activities they might use with their students | Using GPS as part of environmental and Project Globe activities | | Mostly one or two activities per class. In GSCI 161 the project is using statistics to count the number of trees in the arboretum. GPS is used to flag the sample sites. In GSCI 166, the students learn about Project Globe. They do a Google Earth activity to record sample site coordinates and comments. Remy has also done scavenger hunts with them. | |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kolvoord, Bob | CISAT | GEOG 161, ISAT 180, IA 341, ISAT 545, special topics classes, formerly taught GIS and the Environment | GEOG 161/ISAT 180 are the dual enrollment courses in the Geoapatial Semester - a joint program with high schools, IA 341 - Data visualization, ISAT 545 - Applications of GIS for Resource Management | | High school students in GEOG 161/ISAT 180, IA majors in IA 341, MSISAT students in ISAT 545, GIS and the Env. class had a mix of ISAT and GS students | | All classes, but this is not a priority in most classes | This is the primary activity - applicationsof GIS to support decision making | ArcGIS - full suite including extensions, DNR Garmin | Entire term for all classes but IA 341 - approx. half term for IA 341 | reinstate GIS and the Environment; Spatial Epidemiology/Health Care Apps of GIS |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kraenzle, Helmut | CISAT | GGeoG 200, GEOG 366, GEOG 466, GEOG 467 – JMU, he has also taught MSISAT courses - 580 and 680 and GIS couse in the Emirates when he taught abroad for a year | GenEd Geography (GGEOG 200), GIS (GEOG 366), Spatial Databases (GEOG 466), GIS Management (GEOG 467) | | Majors in all the courses, except GGEOG 200 | | All the courses except GGEOG 200 | GGEOG 200 | ArcGIS, Open Source apps, Bentley GOS, Intergraph GIS and Small World in GIS classes, GoogleEarth in GGEOG 200 | Virtually every day | Programming class using GIS; Developing and using Open Source GIS |
| Nash, Carole | CISAT | GEOG 245 (no longer offered); GEOG 315; GEOG 280 | GEOG 245 - GPS; GEOG 315 - Field Studies, GEOG 280 - Human Geography | GEOG 315 - GS majors, GEOG 280 - mix of majors | | | Field Studies class | Human Geography class | Survey-grade GPS and ArcGIS | GEOG 315 - 1.5 week module, GEOG 280 - 1 week | Would like to revise/update GEOG 245 class and include ArcGIS in GGEOG 200 |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Papadakis, Maria | CISAT | GGEOG 200 | Gen Ed Geography - she does two exercises - a GoogleEarth activity and a National Atlas activity | | Non-majors | | | Entirely | GoogleEarth and online GIS | 1.5 weeks to do each exercise, done outside of class - she arranges for some tech. help for students | Wants to incorporate GIS into GEOG 290 - Human/Environment Interaction and GEOG 320 - Human Dimensions of Global Change |
| Tucker, Gene | CISAT | ISAT 302, ISAT 320, ISAT 321 | Env. Science and Engineering topics - 302 is a lab class | | Mostly ISAT majors | | | Focused on this aspect | Surfer and GPS - data analysis is important, esp. spatial analyssi | 302 - 5 - 6 weeks, 320 - 2 weeks, 321 - 0-4 weeks, depending on the course prokect | Probably not at this point |
| Wilson, James | CISAT | Geog215, 365, 469, 468 | GIS & Cartography | majors, minors, others | mostly majors | | Yes | sometimes | ArcGIS, ArcGIS Server, ArcGIS Explorer, Google Earth | all term | |
| Brent, Robert | CISAT | | | | | | | | | | |
| Luerssen, Remy M | CISAT | | | | | | Yes - Globe | Yes, Wind Energy Outreach | 5 hours per month | | |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tang, Jeff | CISAT | | | | | | | | | | |
| Teel, Wayne | CISAT | GenEd Geograph, ISAT 480 (Malta) | | Non-majors in the gen-ed, ISAT in Malta | | Yes | | GPS | | Possibly | |
| Krikau, Dusty | CSL | | | | | Use for assisting students in understanding where they are going | | | | | |
| Cocking, Dean | CSM | BIO 456-Landscape Ecology; BIO 451-Ecological Systems; GSCI 104 | | | majors (except GSCI 104) | | to introduce students to GIS | | | | |
| Courtier, Anna | CSM | GEOL444 (field geophys), GSCI 104 (Geology of cinema) | physical geology | 1/2 geol students, 1/2 arch students for 444; none majors for GSCI 104 | mix | clarifying spatial patterns with tools | no | yes | all4 | 10% of 444; 15% of GSCI104 | like to use it more in geophysics |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Flint, Billy | CSM | | | | | | | | | | |
| Gobetz, Katrina | CSM | GEOL 110 | | | gen-ed | | teaching GIS and GPS | | | | maybe BIO 412 - Mammalogy and BIO?GEOL 350- Paleobiology |
| Griscom, Heather | CSM | BIO 402 | Forest Ecology | | majors | Very limited in Forest Ecology. For marking their inventory plots | | yes | | limited | no |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hartshorn, Tony | CSM | GGEOL102 ,GEOL340 | env science | nonmajors | | familiarization with tools, building numeracy (eg distances between UTM coordinates to get at tectonic plate movement rates, or ages of plates; I'd like to organize real-time data for team-based student exercises [USGS gages, georeferenced rock geochemistry via Va Div of Mines, VDEQ air quality, VDOT traffic, electricity+water usage via Dashboard, NRCS soil temperatures, Ameriflux carbon balances] in | a little | yes | GoogleMaps with add-ins that display coordinates | 1/10-1/5 of exercises | GSCI 104; GEOL410 |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | some kind of JMU clearinghouse) | | | | | |
| Hudy, Mark | CSM | | | | | | | | | | |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kastendeik, Jon | CSM | | | | | | | | | | |
| Kearns, Cindy | CSM | GEOL110, GEOL399 (VA field camp) | phys geol | mix | | how to use tools; landform id; tectonic plate movement | some | some | GE, GPS | <5% | |
| Leslie, Steve | CSM | GEOL398 (Bahamas), GEOL399 (fieldcamp), GEOL350 (paleo) | | mix of both majors and nonmajors | | | minor | major: showing how the tools are used, field camp is about teaching tool use (GPS) too | ArcGIS field camp minor, GE major | 10% at most, conceptually throughout lectures | GEOL110 (Cindy), increase in all courses |
| Ludwig, Patrice | CSM | | | | | | | | | | |
| Renfroe, Michael | CSM | GBIO 103-Contemporary Biology; BIO 364-Human Uses of Plants; BIO 366-Plants and Environment | | | GBIO 103-gened; BIO 364-majors; BIO 366-IDLS | | | yes | | | |
| Wiggins, Bruce | CSM | BIO 457-Biological Applications of GIS | GIS in biology | | majors | | yes | yes | | | |

| Name | College | In which courses do you use GT? | What is the primary topic of the course? | Who is the audience for the course? | Majors vs. non-majors | What is the purpose of including GT? | Teaching the tools | Teaching with the tools | Which tools? | How much do you &/or students use | Are there other courses where you would like to use the technology? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Showell, Jeff | CVPA | GBIO 103-Contemporary Biology; BIO 364-Human Uses of Plants; BIO 366-Plants and Environment | | | GBIO 103-gened; BIO 364-majors; BIO 366-IDLS | | | yes | | | |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Benzing, Tom | CISAT | mapping, movements, Watershed pollution, Fish kills | ArcGIS, GPS | | Variety | mostly watersheds | | |
| Bernstein, David | CISAT | Use ArcInfo as a data processing tool - research focuses on transportation (GPS Nav and public policy oriented modeling - traffic flow/roads | | ArcInfo and custom tools | Census and TIGER data | Fed. government | local/regional | |
| Bortolot, Zachary | CISAT | Forest inventory; Mapping animals to the species level using remote sensing; Integrating GPS data | | All tools (GIS, RS, GPS) | Imagery data is all gathered elsewhere, ground data is self-generated | Lots from USDA (NAIP imagery), lots of data from Forestry compani | all scales | lots of local work, forestry work in Southeastern US |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| | | with aerial photography | | | | es, USGS | | |
| Brewster, JoAnne | CISAT | Students are doing police work | | | | | | |
| Conaty-Buck, Susan Beth | CISAT | | | | Publically available data | Variety of providers | Interested in all scales | Local health data is of interest |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Deaton, Mike | CISAT | Would like to do more with data visualization and tie it to GST. Has done a project with David Wenos that involved converting CAD drawings to maps and creating DEM's. He'a also interested in integrating system dynamics and GIS | | | He harvests data from a variety of sources (would like to have students collect more data, but not yet) | Sources vary | All scales but a significant focus on US | |
| Goodall, Amy | CISAT | Yes. On-going project for South African crane conservation | | Arc GIS | Field Collected Data | | Subcontinental | Sub-Saharan Africa, USA, |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Higgins, Patricia | CISAT | Terrorism | Developing maps to locate terrorist activities, mapping drone attacks in Pakistan/Afghanistan; Using maps to do interactive timelines of border changes/locations; Some interest in local utility infrastructure | ArcGIS | Some public data and some data created by Patricia and her student (congressional funding data) | Sources vary | National and Global, though interest in specific regions around the globe | USA, Pakistan/Afghanistan |
| Klevickis, Cindy | CISAT | | | | | | Local | The arboretum and weather stations around JMU |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Kolvoord, Bob | CISAT | Developing curriculum and professional devleopment for K-12 teachers and students to use GST. Studying the changes in students' spatial thinking skills with the use of GST; writing collections of scenario-based curricula for K-16 | See above - GST is the central tool | ArcGIS, AEJEE, GoogleEarth | Variety of data | Sources vary | All scales | |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Kraenzle, Helmut | CISAT | Open Source; GIS Models; GIS Management | Applying the range of GST to these areas | Same as above | Student-created and public data | For VA and US data - various providers, he also uses some European data | Spans all scales | |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Nash, Carole | CISAT | Archaeological field work | GPS - teach student workers to use GPS to gather data for her archaeo. field studies' ArcGIS - predictive modeling, cost-path analysis and viewshed studies; Remote Sensing - use satellite images to look at landscape change over time | Survey-grade GPS and ArcGIS | GPS - she and her students create their own data; ArcGIS - use data created by others | Sources vary | Teaching - all scales; Research - local/regional | Research - Appalchia |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Papadakis, Maria | CISAT | Using GIS in developing a land use planning tool - VA Renewable Siting Scoring System; also using GIS in South Fork Shenandoah Rapid Watershed Assessment to characterize health and issues in South Fork watershed | GIS is the tool for the scoring system - created lots of data layers | ArcGIS | Most data obtained elsewhere | Sources vary | Teaching - all scales; Research - regional and local | Virginia and Shen Valley for research |
| Tucker, Gene | CISAT | | | | Pollutant concentrations | Self/student-generated | Local | Harrisonburg/Rockingham County |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Wilson, James | CISAT | Distributed GIS, long-term human-environment interactions | many ways | ArcGIS, ArcGIS Server | many | myself, public sources | local to global | Shenandoah Valley, Virginia, Chesapeake Bay, US, Global |
| Brent, Robert | CISAT | | | | | local - state | watershed wide | |
| Luerssen, Remy M | CISAT | | | | Off shore wind related | | | |
| Tang, Jeff | CISAT | | | | | | | |
| Teel, Wayne | CISAT | Sustainability. Students are conducting research. | | | | | | |
| Krikau, Dusty | CSL | | | | | | | |
| Cocking, Dean | CSM | | mapping Shenandoah Valley for mercury research | ArcGIS, GPS | | self along with James Wilson | regional | Shenandoah Valley |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Courtier, Anna | CSM | mapping/plotting survey results | mapping/plotting survey results | all 4 | class or self-generated data, DTM? | | local-->global | ditto |
| Flint, Billy | CSM | | salamander ecology: range distribution mapping and survey site identification | | topo maps, salamander distribution | self developed | regional | Allegheny mountains |
| Gobetz, Katrina | CSM | | mapping rodent burrows (GIS, GPS); species distribution in Africa (Google Earth) | ArcGIS, GPS, Google Earth | own, plus Google Earth layers | | regional; continental | Shenandoah Valley; Africa |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Griscom, Heather | CSM | | analyzing the spatial distribution of trees. Also uses GIS to randomly select plots for experiments | ArcGIS, GPS, Google Earth | tree distribution data | self developed | local | VA-WV |
| Hartshorn, Tony | CSM | mapping soil and rock carbon | georeference sample inventory | ArcGIS | NRCS SSURGO and STATSGO soil survey polygons | USDA NRCS | regional | Shenandoah Valley, eastern WV, Piedmont |
| Hudy, Mark | CSM | | large scale assessments of watershed condition | ArcGIS, GPS | lots of USGS layers, NHD, SRTM | | some national, most East coast | some national, most East coast |
| Kastendeik, Jon | CSM | | locating transects for seedling plantings | GPS | | self developed | local | Smith Creek |

| Name | College | What is the focus of your research where you use GT? | How do you use GT in your research? | Which tools? | What data are you using? | Who developed it? | What is its spatial scale? (local, regional, national, global) | What specific geographic areas are you examining |
|---|---|---|---|---|---|---|---|---|
| Kearns, Cindy | CSM | outcrop mapping | | GPS, GE | aerial imagery, GE for azimuths | public | cross-scale | regional to global |
| Leslie, Steve | CSM | paleoGIS, paleoBiogeography | showing spatial and temporal distrib of fauna | GE also PGIS=Texas/Arlington | fossil distribution data: not always shapefiles …. Facies distrib | self-generated | cross-scale: from regional-global | zoom in on N.Am., Europe, minor China |
| Ludwig, Patrice | CSM | | | GPS | | self developed | local | Mountain Lake |
| Renfroe, Michael | CSM | | | | mostly Google Earth | | global | |
| Wiggins, Bruce | CSM | | determining landscape metrics of polluted watersheds | ArcGIS, GPS | lots of USGS layers, NHD, SRTM | | regional | Shenandoah Valley |
| Showell, Jeff | CVPA | | | | mostly Google Earth | | global | |

*Future*

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Benzing, Tom | CISAT | Student expertise | | | |
| Bernstein, David | CISAT | Central data warehousing; central licensing/funding of the software | | SUNY Buffalo and UC Santa Barbara | |
| Bortolot, Zachary | CISAT | In pretty good shape at present | Access to grad students; Center to organize GST activities to facilitate collaboration, grant-seeking | Virginia Tech and George Mason | |
| Brewster, JoAnne | CISAT | | | | |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Conaty-Buck, Susan Beth | CISAT | $$ and time - she'll continue to use it in teaching, but would consider branching out to do more | Do we need to have coursework (via CIT or CFI) to help folks learn how to use these technologies? Seems like a natural for both HHS and STEM. | | Interested in more locally-based activtiies (w/more local data). A key issue is local Community Health data collection. A JMU faculty member who teachers epidemiology (Kristi Lewis) – might be worth a conversation<br><br>Health Communications folks (from Communications Studies – Charlene Thompson) – use of GST in helping to communicate |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Deaton, Mike | CISAT | Up-to-date and detailed campus map w/multiple layers would be very useful | More focus on neogeography /openmap.org – lots of opportunities for student learning; Data clearinghouse/data portal (data plus lessons/activities and ideas); | Hub of expertise to provide training/consulting (along the CFI model); This group might manage a JMU Data portal; This group would sponsor lots of things (workshops/mini-grants, etc.); More capabilities and time to explore data visualization software and time | |
| Goodall, Amy | CISAT | More expertise, addition of ERDAS Imagine software in our lab | | | |
| Higgins, Patricia | CISAT | Would like to have a class - education is key | Needs to better understand the suite of available tools and what each one does. People want to put their data/information on maps (esp. social networks); Interested students (both undergrad and grad) would let her expand her research | | Regularly hears that there's demand for more mapping (in Infrastructure world) – may be funding opportunities out there. |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Klevickis, Cindy | CISAT | Remy Luerssen's help | Having access to higher quality GPS units (she has the very low-end Garmin units. | | |
| Kolvoord, Bob | CISAT | The Geospatial Semester has expanded as much as I can manage by myself - additional help would allow us to impact more schools; Additional local technical support would be useful, as well as tech support for server-based applications | Campus center for GST, summit of GST users, integration of GST broadly across campus, ongoing focus on GST teaching and scholarship | Univ. of Redlands | I agree with Carole Nash - we're on the front edge of the wave and spatializing the curriculum could pay huge dividends in a variety ways, but that requires leadership and commitment. |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Kraenzle, Helmut | CISAT | More software availability (move beyond ESRI as sole vendor), time to learn new tools to bring to the classroom (would like to teach the full range of GST - look at development and design of systems) | Time (primarily research time) - this time can lead to additional funded projects that could pay for future release time; A common goal would allow us to identify cross-cutting projects; Motivation - if institution is committed to raising the profile of GST (impacting all students, building capacity) - would help to motivate faculty (he gave the example of requiring one GST-enriched class for Gen Ed) | | |
| Nash, Carole | CISAT | Develop a set of trained students that could staff a support center for faculty and others; Center for Application of GST – physical space for training, help, etc. (CIT-like); Regular meetings of GST users to discuss needs/challenges, etc. | More training in advanced uses of GIS, esp. in modeling; Fuding for regular training | | We've just scratched the surface of our capabilities – not even begun what we're capable of doing. Time and resources would let us develop a vision, perhaps to include geospatial literacy as part of Gen Ed. |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Papadakis, Maria | CISAT | Needs formal training to build her GIS skills; Having a symposium where GST users share what they do would help inform what's going on and would be very useful; Another shot at the GoogleEarth sandbox (esp. with her own content) | Her constraint is her own skill set and time to do the development she wants to do (in teaching and research) Support for growing research effort in Colony Collapse (organizing the group and supporting some initial work) – very little spatial analysis so far. | | |
| Tucker, Gene | CISAT | More current version of Surfer software; a GIS for the Environment class (co-taught by GS and Environment faculty) | No time to do more | | It's a wonderful day in the neighborhood |
| Wilson, James | CISAT | better tech support for servers & application development | additional server capacity | | |
| Brent, Robert | CISAT | Student expertise, Time for teaching | | If ISAT students were trained, things could happen with research and teaching | |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Luerssen, Remy M | CISAT | Projects | Time | | |
| Tang, Jeff | CISAT | | | | |
| Teel, Wayne | CISAT | Student expertise, Time | | | |
| Krikau, Dusty | CSL | | | | |
| Cocking, Dean | CSM | time for more training | | | |
| Courtier, Anna | CSM | extra datasets to tackle in class projects | big picture datasets to crunch | no | |
| Flint, Billy | CSM | | | | increased installation of ESRI software around campus? |
| Gobetz, Katrina | CSM | GPS units to check out for class use | | | |
| Griscom, Heather | CSM | Need to have a crash course | | | |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Hartshorn, Tony | CSM | Short courses to get students ramped up? could we develop something similar to the Susquehanna River Basin (http://www.srbc.net/atlas/)... or does something like this exist... but for the Chesapeake Bay? | User meeting group? | UCSB, Clark, Sonoma State? | |
| Hudy, Mark | CSM | educated grad students | a "GIS-Help Desk" (a human to talk to) | | |
| Kastendeik, Jon | CSM | GPS units to check out for class use | | | |
| Kearns, Cindy | CSM | longer semesters would provide more opportunities for integrating GT | | no | |

| Name | College | What's needed in order for you to continue using GT in your teaching or research? | What would enable you to do more? | Can you identify other schools that might serve as a role model for the use of GT across the curriculum? | Any other thoughts? |
|---|---|---|---|---|---|
| Leslie, Steve | CSM | increased targeted training opps for students and faculty | | none | GT ought to be incorporated cross-curriculum, from initial courses thru capstone courses… requires a concerted JMU effort to make sure that faculty are trained up so that it becomes as second nature as bb or ppt |
| Ludwig, Patrice | CSM | survey-grade GPS | | | |
| Renfroe, Michael | CSM | time for training | | | |
| Wiggins, Bruce | CSM | | | | |
| Showell, Jeff | CVPA | time for training | | | |

## Appendix F: Follow-Up Question Responses From Interested Users

*Education*

| Name | College | Rank | Years at JMU | How do you know about Geospatial Technologies (GIS, remote sensing, mapping)? | Do you anticipate your primary use of Geospatial Technologies to be in teaching or in research? | Is there a specific course you are considering for Geospatial Technology use? | What is the topic of the course? | Who is the audience for the course? | What would be your goals in including Geospatial Technologies? | Teaching tool usage? | Teaching with Geospatial Technology tools? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blake, Charles** | CAL | Full | 18 | seeing on campus, read about | | intro, comparative politics, global issues, aspects of urban geog -> political geog, social | | majors & gen ed | | | Yes |
| **Harter, Tracy** | CAL | Asst | 4 | hear about it, CIT, etc | research & outreach | | | | | | |
| **Prins, Rob** | SoE | Asst | 3 | have heard of GPS and GPS logging from popular sources | research | | | | | | |

*Research, Data, and Future*

| | | Research | | | Data | | | Future |
|---|---|---|---|---|---|---|---|---|
| **Name** | **College** | **Is there a specific research project you are considering where Geospatial Technology use would be beneficial?** | **What is the focus of your research ?** | **How do you anticipate Geospatial Technology could help you reach the goals?** | **What is the spatial scale that you are interested in?** | **Local/ regional/ national/ global** | **What data do you anticipate collecting or analyzing?** | **What assistance would you require to implement usage of Geospatial Technology in your teaching or research?** |
| **Blake, Charles** | CAL | | | | global & local: urban; unfamiliar w/ data; human & physical | | | once a year: 2-hour workshop on basic knowledge, interface w/ data we already have, what's next for training, don't know if software is available on university wide access; did revise public policy undergrad program based on our new curriculum; Gary Kirk: grad coordinator for grad program; other fac in program would be interested in training/workshops |
| **Harter, Tracy** | CAL | oral history collection, pre Civil War documents | | | | Y | | help w/ standardization for maintenance, serving, etc; exposure to who else is doing, training, basic framework data; |

| | | Research | | | Data | | | Future |
|---|---|---|---|---|---|---|---|---|
| **Name** | **College** | **Is there a specific research project you are considering where Geospatial Technology use would be beneficial?** | **What is the focus of your research ?** | **How do you anticipate Geospatial Technology could help you reach the goals?** | **What is the spatial scale that you are interested in?** | **Local/ regional/ national/ global** | **What data do you anticipate collecting or analyzing?** | **What assistance would you require to implement usage of Geospatial Technology in your teaching or research?** |
| | | | | | | | | haven't explored getting access to software; Julia Merkel |
| **Prins, Rob** | SoE | yes | range modeling of electric vehicles | provide route data including distance, topography, perhaps traffic controls | local/regional | | GPS logger data collected by self or students, perhaps use ArcGIS to model unlogged routes | Access to person(s) knowledgeable in Geospatial Technologies in general and ArcGIS in specific. Would like to be able to refer students to a a person or course as well. Also, assistance getting started with ArcGIS (where to go for download, access to tutorials, etc). |

**Appendix G: Geospatial Technology Courses Identified By The Task Force**

- T indicates teaching the tool instead of teaching with the tool

CISAT

- GGEOG200: Geography: The Global Dimension
- GEOG161: Geospatial Tools and Techniques T
- GEOG210: Physical Geography
- GEOG215: Geospatial Tools I T
- GEOG 216: Geospatial Tools II T
- GEOG230: Spatial Thinking T
- GEOG245: Global Positioning Systems T
- GEOG280: Cultural Geography
- GEOG315: Field Studies
- GEOG340: Biogeography
- GEOG 350: Special Topics
- GEOG366: Geographic Information Systems T
- GEOG385: Principles of Remote Sensing T
- GEOG465: Topics in GIS T
- GEOG470: Senior Seminar in ECSD
- GEOG485: Processing Remotely Sensed Data T
- GEOG490: Independent Studies
- GSCI151: Science Processes and the Environment
- GSCI166: Science Processes and the Environment
- IA342: Visualization Methods, Technologies and Tools for Information Analysis T
- ISAT180: Topics in Integrated Science and Technology
- ISAT302: Environmental Lab
- ISAT320: Environmental Fundamentals
- ISAT321: Environmental Projects
- ISAT 545. Applications of GIS for Resource Management
- NSG460/HHS460: Healthcare Informatics

CSM

- GBIO103: Contemporary Biology
- BIO364: Human Uses of Plants
- BIO366: Plants and Environment
- BIO/GEOG402: Forest Ecology
- BIO451: Ecological Systems
- BIO456: Landscape Ecology
- BIO457: Biological Applications of Geographic Information Systems T
- GGEOL102: Environment: Earth

- GSCI104: Mapping the Living World, Geology of Cinema, other?
- GEOL110(H): Physical Geology
- GEOL210: Applied Physical Geology
- GEOL211: Introduction to Oceanography
- GEOL272: Planetary Geology
- GEOL340: Soils and Land Use
- GEOL365: Structural Geology
- GEOL398: Topics in Geology (Bahamas)
- GEOL399: Field Geology (Field camp) T
- GEOL 442: Field Geophysics

<u>CAL</u>

- ANTH410: Spatial Analysis for Anthropologists
  SOCI 316: Global, Spatial and Temporal Analysis