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The Geospatial Semester

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The Geospatial Semester: Connecting GIS and Virginia's High Schools

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What would make high school students get out of bed and come to school 45 minutes before the start of the day? What would make them stay after school and beg to work on weekends and during their spring vacation? What would get high school seniors to engage in challenging work in their final semester? The answer, believe it or not, is GIS. The students described above are participating in a unique joint effort between Virginia high schools and James Madison University (JMU) called the Geospatial Semester.

The Geospatial Semester is a dual-enrollment program where students can earn JMU credit as they earn their final high school credits. However, it is much more than just taking a college course early. Students must engage in an extended GIS-based local research

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project and learn how to work as part of a team (with all the challenges that teams present) in order to complete the course. Students commit 1-2 periods per day for either a single semester or for a full year. They can earn from 3 to 12 credit hours from JMU (most students earn 3 to 6 credit hours). We offer the credit hours at a steep discount (70% off) to encourage as many students as possible to participate.

Why GIS? Geographic Information System (GIS) software is a fundamental tool for many businesses and government agencies. Its influence is pervasive in a variety of industries and academic fields of study, and yet only a very small percentage of high school students ever hear about GIS, let alone have a chance to learn about the tool or spatial thinking and problem solving. "Learning to Think Spatially", a recent study from the National Research Council (National Research Council, 2005), reinforces this point and makes the case for why spatial thinking needs to be an important part of the K-12 curriculum. Furthermore, many high school students do not seriously engage in their final semester of high school (think back to your own experience!). The Geospatial Semester is an attempt to address both of these issues (and perhaps kill two birds with one stone).

This is not a typical dual-enrollment program. In most dual-enrollment situations, the high school teacher

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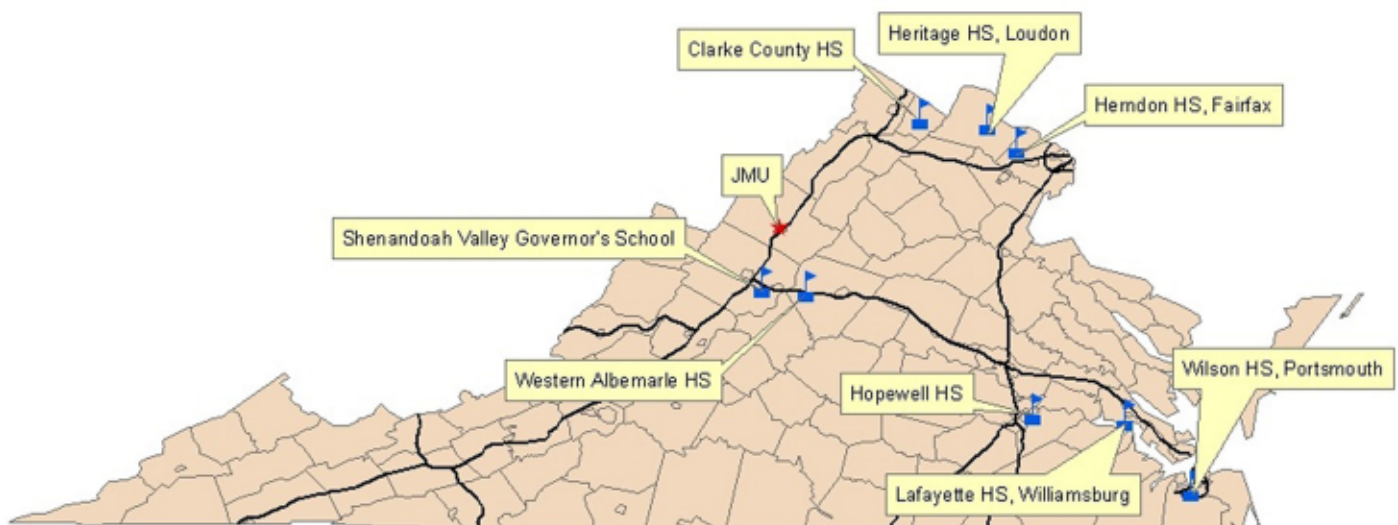


Figure 1: Geographic distribution of schools participating in the Geospatial Semester in the 2006-2007 school year.
Map produced by Dr. Bob Kolvoord

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simply teaches from the college syllabus with little to no support from the higher education institution. However in the Geospatial Semester, we provide regular technical support and GIS and project mentoring, along with periodic classroom visits. This ongoing support is critical to the success of the program.

In our second year of the Geospatial Semester, we are in eight schools and working with approximately 140 students (we started with four schools and 40 students last year). Figure 1 shows the geographic distribution of participating schools in Virginia.

Students learn the basics of GIS, working with ArcGIS 9.1. They learn about vector and raster data and use the Spatial and 3-D Analyst extensions. They work through a variety of exercises of increasing complexity as they move towards their capstone project. In fact, many teachers give the students smaller-scale projects to help them build their project management and team-building skills in advance of the final project. The software is provided as a part of the Virginia Geospatial Instructional Application Initiative, sponsored by the Virginia Department of Education, at no cost to the schools.

The scope of the capstone projects varies depending on the length of the class (one or two periods, single semester or full-year). Students in Hopewell last year completely redid the school district's bus transportation map in the wake of the tragic death of the Hopewell City School's Transportation Director. There was little information written down and the district was faced with either hiring consultants or

engaging the Geospatial Semester students. They chose the students and the students did a fabulous job, working tirelessly (nights, weekends, and vacations) to complete the task. In fact at Hopewell High School this year, due to a scheduling quirk, the students actually come during 0 period, 45 minutes before the nominal start of the school day to take the Geospatial Semester class. A primary reason for the success of the Geospatial Semester is a corps of outstanding high school teachers. Jay Ruffa, an Earth Science instructor at Hopewell High School, is one of those teachers and he led his group of students to their extraordinary success last year. Figure 2 shows an example of the Hopewell students' handiwork.

Stephen Tatum and Richard Aadahl are Career and Technology Education (CTE) teachers at Lafayette High School in Williamsburg and they're also participating in the Geospatial Semester. Stephen Tatum led the class last year

and his students pursued a variety of projects, including an attempt to track down the perpetrators of the Mississippi church burnings last spring. The students predicted the home county of the arsonists based on the spatial array of the crimes and were quite pleased to discover that they had been spot on when the criminals were finally apprehended.

Administrative support at the high school level has been critical to the success of the project and Portsmouth City Schools administrators Laura Nelson and Dan Lewandowski have ensured the success of the project in Portsmouth. This year, students from three different high schools come together to participate at Wilson High School. With 30 students, Portsmouth

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Figure 2: City of Hopewell school transportation routes. Map produced by Geospatial Semester students at Hopewell High School.
Map courtesy of Mr. Jay Ruffa

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has the largest class of any Geospatial Semester school and in fact, the administrators report that they could have filled 60 seats. They hope to have the program in all 3 high schools next year. Portsmouth is further distinguished by their ongoing efforts to weave GIS and spatial thinking throughout the curriculum from elementary to high school.

The project is not without challenges. Technical support and software installation and upkeep are critical to the students' success. Teachers need to have both good professional development and access to quality data. We're still working to connect Geospatial Semester teachers with public- and private-sector resources in their areas to help provide data and project possibilities. We're also working with other higher education institutions in Virginia to help them understand how to transfer the JMU credit.

We continue to look for opportunities to grow the program into school districts that are ready to share this kind of experience with their students. Please contact Dr. Bob Kolvoord at kolvoora@jmu.edu for more information or to consider participating or supporting efforts in your area.

References

National Research Council (2005)
Learning to Think Spatially.
Geographical Sciences
Committee, *National Academy Press*, Washington, DC.

Update from VGIN

By Dan Widner,
VGIN Coordinator

VGIN has undergone significant organizational and staff changes over recent months. Here is a quick summary of the current VGIN organization.

VGIN has joined the Public Safety/911 staff into a new division within the Virginia Information Technologies Agency that is called the Integrated Services Program (ISP). ISP is headed by Steve Marzolf. The VGIN group is headed up by Dan Widner - VGIN Coordinator and includes Stu Blankenship - Geospatial Projects Manager; Sam Hall - Geospatial Projects Manager; Lyle Hornbaker - Local Government GIS Manager; John Owens - Technical Services Manager.

Below is a status (as of March 1, 2007) for our current large scale initiatives.

The 2006/2007 VBMP Orthophotography Project will provide updated high resolution imagery for the entire Commonwealth. For this image acquisition project, VGIN offers true color imagery at a base scale of 1"=200' with 1 foot pixels. Optional upgrades offered include 1":100' photography with 6 inch pixels, 2 or 4 foot contours, and planimetrics. Many localities have chosen to take advantage of these upgrades. Approximately 14% of the state was captured during the spring of 2006, and this imagery will be delivered to VGIN by the end of April. The imagery will be available in GeoTiff and MrSID formats. VGIN will be working with local governments and other customers to deliver the product in a timely manner. The imagery will also be loaded onto VGIN's Geospatial Enterprise Platform (GEP) and will be available to our customers as in internet

map service. The remainder of the state is being flown this year and will be delivered to VGIN during the spring of 2008.

VGIN is managing a project to deploy the Emergency Management Mapping Application (EMMA) to the Virginia Emergency Operations Center (VEOC). EMMA is a product of Towson University's Center for Geographic Information Sciences. The project is funded through a Department of Homeland Security (DHS) grant. VGIN is also facilitating a separate but closely related project to deploy EMMA to the cities of Charlottesville, Richmond, and Virginia Beach. EMMA is based on ESRI ArcIMS software and is designed to integrate with WebEOC, the Commonwealth's Crisis Information Management System. For more information on the deployment of EMMA in Virginia, see Brian Crumpler's article in this edition of the newsletter.

VGIN is also in the midst of deploying the Virginia GIS Metadata Portal to hold information about GIS data available in the Commonwealth (The Code of Virginia mandates that VGIN provide a geospatial metadata catalog for the Commonwealth). The portal will be available for data population and use beginning in the May 2007 timeframe. VGIN, in conjunction with the Virginia Geospatial Extension Program at Virginia Tech, will develop training for the system and provide outreach to potential metadata producers. This site will allow state and local government producers of geospatial data across Virginia to register and maintain metadata records about their available datasets, with public access for search and viewing and restricted access for updating. *This will become the primary location to browse and discover available GIS data in the Commonwealth.* The metadata site will be based on ESRI's GIS Portal
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VGIN Update

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Toolkit suite of software, which utilizes ArcIMS and ArcSDE as backend software components.

Road Centerline Project (VBMP-RCL). The RCL project will be moving to steady state maintenance the spring of 2007. RCL offers statewide road centerlines as the framework roadway transportation base map layer. Localities and state agencies will have access to regional and statewide geocoding for emergency response and GIS purposes. VBMP RCL is based upon locality updates of streets and address ranges of local roads and statewide updates from VDOT for the Interstate and Primary roads. The vision of a common roadway basemap for state and local government is being realized. It will facilitate access to additional business data from VDOT as well as current and accurate local road centerline data.



Free Software Reminder!

ESRI has announced a promotion to offer free copies of ArcGIS (ArcView) software to any student enrolled at a college or university in Virginia that is part of a state-wide or campus-wide site license.

This is a one year license that will expire 365 days from the day it was installed. It includes Spatial, Network, Geostatistical and 3D Analyst extensions.

To find out more about the program go to:

http://www.esri.com/industries/university/education/student_faqs.html



Save the Date

Remote Sensing for Spatial Analysts and Coastal Resource Managers
March 27-28 2007, Richmond, VA

Registration Fee: None

For additional information:
<http://www.virginiaview.net/workshops.html>

The Virginia Tech Office Geographic Information and Remote Sensing (OGIS) Research Symposium will be held on April 20th from 8:30 - noon on April 20th.

Registration Fee: None

For additional information:
<http://www.ogis.org.vt.edu>

The Virginia Association for Mapping and Land Information Systems (VAMLIS) Spring Conference will be held May 7-8th at the Richmond Convention Center.

Registration Fee: \$185

For additional information:
<http://www.vamlis.org/vamlis>

The ESRI Education User Conference will be held June 16-19 in San Diego, CA.

Registration Fee: \$150

For additional information:
<http://www.esri.com/events/educ>

The ESRI Education User Conference will be held June 16-19 in San Diego, CA.

Registration Fee: \$1,295

For additional information:
<http://www.esri.com/events/uc>

Movin' On

We wish you the best...

Stuart Blankenship, formally the GIS Manager with the Virginia Economic Development Partnership (VEDP), now serves as the geospatial projects manager at the Virginia Geographic Information Network (VGIN).

Minda Brown, who has served as the GIS Manager for the Virginia Department of Forestry (VDOF), is heading for sunnier and sandier pastures in Florida.

Sam Hall, formally served as the Fish and Wildlife Information Services Manager with the Virginia Department of Game and Inland Fisheries (DGIF) now serves as the geospatial projects manager at the Virginia Geographic Information Network (VGIN).

