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## *Competency Models In Action:*

# **Geospatial Technology Competency Model Drives Innovation**

May 2013

- GeoTech Center geospatial technology courses available for customization
- Virginia geospatial initiative guides curriculum development, builds educator knowledge and increases student awareness of geospatial career opportunities
- Geospatial technology workforce preparation: a focus of community college consortium

### **Introduction**

The wingspan of ETA's Geospatial Technology Competency (GTC) Model continues to grow wider. At both the national and state levels, innovative, interconnected initiatives are underway using the GTC model to align curricula, provide professional development, increase student career awareness and enable articulation and dual enrollment agreements.

### **GeoTech Center**

ETA's GTC model was developed in collaboration with the GeoTech Center, a National Science Foundation Advanced Technology Education (NSF/ATE) funded project to support geospatial education at U.S. community colleges. Since the launch of the GTC model in 2008, the GeoTech Center has taken the lead in developing Model Geospatial Courses.

Starting with the GTC model as the foundation for this effort, the GeoTech Center compiled a Meta-DACUM (Developing a Curriculum) by convening panels of expert workers across the country to discuss the skills and competencies needed to perform geospatial occupations. Next, the team engaged expert geospatial educators to take the competencies defined by the workforce panels and to create syllabi for Geospatial Science and Technology Model Courses. These courses can be downloaded on the GeoTech Center Web site <http://www.geotechcenter.org/> for further alignment with local workforce needs. "To date, 54% of the course downloads have been from universities, 34% from community colleges, and the remaining 12% from individuals," says Ann Johnson, Associate Director, GeoTech Center.<sup>1</sup>

In California, industry and educators have already come together to align curricula with the Model Courses in a 30-unit curriculum for a California Community College Model Course and Geospatial Certificate program. "We need to think locally to begin thinking globally," says Ms. Johnson. "California is way ahead. The rest of the nation is catching up."

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<sup>1</sup> <http://www.geotechcenter.org/Resources/Resource-Center/Featured-Items/GTCM-Curriculum-Guide/Model-Course-and-Certificate-Development>

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## National Information Security and Geospatial Technologies Consortium (NISGTC)

NISGTC, a Department of Labor grantee, is a national consortium of seven community colleges in five states. Its mission is to meet industry's needs for an educated and prepared information technology workforce. Geospatial technology is one of its four focus areas.

"All of our colleges work with GeoTech," says Phillip Davis, former Principal Investigator, GeoTech and current Curriculum Manager, NISGTC. "We are using subject matter experts to put 'meat on the bones' of the syllabi for the GeoTech Model Courses and build a national curriculum. Our team is nearing completion of ten fully online courses based on the GTC model. We are developing lesson plans, presentations, course modules, lecture materials, Power Points, screen shots and lab assignments with detailed instructions. Our goal is a curriculum that can be utilized nationwide for many different purposes for many different audiences: educational institutions, state government and proprietary training companies." All of the curricula will be available online as downloadable resources at no cost to users. The model courses are being beta-tested at the NISGTC partner community colleges, and will be formally launched at a major geospatial conference in July 2013.

"We've also started working with a contractor to develop remote access virtualized labs that will be ready for presentation at the July conference," says Mr. Davis. "This innovation will enable students to complete their lab work by logging into a computer server on the Internet using specialized software remotely. In fleshing out the model courses, we put the emphasis on highly interactive, activity-driven e-learning. Combined with remote access virtualized labs, this dynamic national curriculum is the beginning of a new horizon for geospatial education."

## Expanding Geospatial Technician Education through Virginia's Community Colleges (GeoTEd)

The good news is that Virginia is also ahead of the curve. The GeoTEd initiative, another NSF/ATE project administered by the Virginia Space Grant Consortium (VSGC), is helping Virginia's community colleges to increase geospatial courses and pathways, provide professional development for faculty, and build career awareness for high school students. These strategies are all designed to increase and diversify the future geospatial technology workforce. The initiative is focused on building academic pathways to employment for Geographic Information Systems (GIS) technicians at partnering community colleges that can serve as models for other colleges. In addition to VSGC, the project partners are Virginia Western Community College, Thomas Nelson Community College, Southwest Virginia Community College, J. Sargeant Reynolds Community College, Virginia Geospatial Extension Program at Virginia Tech University and the Virginia Community College System.<sup>2</sup>

The GeoTEd team is customizing the GTC model to help guide curricula for Virginia and the region. This curriculum is also based on the results of a state DACUM analysis for geospatial technician competencies in Virginia. The customized GTC model will be used in the development of the distance-learning courses as a part of the GeoTEd project to provide model courses to Geospatial Institute participants. "The GTC model was an excellent resource for

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<sup>2</sup> <http://www.geoted.org/geoted-project-description>

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demonstrating the competency-based approach to modifying curriculum,” says Cherie A. Aukland, Associate Professor of Information Technology, and Program Head for GIS, Thomas Nelson Community College, and a Virginia faculty participant in the development of the modified GTC model.

“It’s such a new science in so many ways. In aligning curricula to conform to the GTC model, we want to get it right, based on information from Virginians who are knowledgeable about the industry,” says David Webb, Assistant Professor of Mechanical Engineering Technology and GIS, Virginia Western Community College, a faculty participant in the development of all of the GTC model courses. All four GeoTEd partner community colleges are currently offering geospatial curricula aligned with the GeoTech model courses.

Professional development is another objective of GeoTEd through intensive hands-on workshops, mentoring and follow-up support to increase the GIS knowledge base of educators. The project team is setting up a mentorship program with the Virginia Association of Mapping and Land Information Systems so that community college faculty will have access to professionals in the field. The Virginia Geospatial Extension Program will host two one-week summer Geospatial Institutes in 2013 and 2014 for the same cohort of community college faculty from Virginia and the five-state region (MD, WV, TN, KY, and NC) at Virginia Tech. Dual-enrollment high school teachers from the service regions of the four Virginia community college partners will also attend the Institute to build relationships with faculty with the goal of establishing dual-enrolled courses with the colleges. GEOTREK-12 is another professional development program offered by VSGC to introduce K-12 educators to the value of geospatial technology in the classroom, and the job market. The program is presented as a three-day summer workshop, introducing participants to the most commonly used geospatial technologies: Global Positioning Systems, Remote Sensing and Geographic Information Systems.<sup>3</sup>

Building career awareness in high school students is also part of the GeoTEd project, providing educators with classroom ready lessons, and guidance on integrating geospatial information in other subject areas, including the social sciences. “For example, using GIS technologies, social studies students can track the strategic decisions of the Union and Confederate troops to move to specific battlegrounds during the Civil War,” says Professor Webb. Career pathways are also an important component in the GeoTEd project. Four Virginia partner high schools in the Roanoke area now offer college level GIS courses which count towards high school graduation as well as college credit. In addition, work is underway to create articulation agreements between Virginia four-year educational institutions and the partner community colleges.

“VSGC is pleased to serve as a catalyst to increase the number of trained geospatial technicians in Virginia,” says Chris Carter, Deputy Director, VSGC. “The partnering faculty in Virginia are developing some great workforce-driven model pathways, and the professional development led by Virginia Tech has been successful in helping colleges statewide to start geospatial courses.”

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<sup>3</sup> <http://vsgc.odu.edu/>

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## Related Links

GeoTech Center

<http://www.geotechcenter.org/>

National Information Security and Geospatial Technologies Consortium

<http://nisgtc.org/>

Virginia Space Grant Consortium

<http://vsgc.odu.edu/EGTEVCC/>

GeoTEd

<http://www.geoted.org/>