

# Hands-on GIS Education

## Learning by Creating



*Nautiz X7 in school GPS project*

***Students at Atlantic Cape Community College get hands-on GIS education while building a sophisticated emergency response management system***

by the editors

### **Geospatial Skills: A growing need in the labor marketplace**

When geospatial technology was identified by the U.S. Department of Labor as one of the nation's three fastest-growing workforce needs, Atlantic Cape set out to meet the demand.

The school won a Department of Labor grant to start a new program, and hired Luis Olivieri to assist in the development and management of the project. Olivieri, who has worked with GIS and remote sensing technologies for 20 years, had a research and teaching position with the University of Puerto Rico and worked as a consultant before moving to New Jersey to start the program.

Instead of copying existing GIS curriculum, the program was designed to create one that would match up to the needs of the marketplace. That started with two courses: Intro to GIS and Geospatial Data Collection.

As Olivieri considered the technology needs for the courses, he knew that simple GPS units were sufficient for the introductory course. But they wouldn't do for data collection; he needed to find something more suitable. In his words, he wanted to "put students in the field using a real handheld device with more capabilities than a basic GPS unit."

### **Comparing, contrasting and buying**

"I wanted accuracy to 3-5 meters, real-time connection capability and a good camera," Olivieri explains. "And it had to run Windows Mobile, because we were using ESRI ArcPad software. And finally, ruggedness was very important." Finally, the school bought 10 X7 units.

### **Integrating new technology into real-world education**

Olivieri saw an opportunity to accomplish two important goals with the Geospatial Data Collection course. He and the course instructor believe students need real-life experience, not just book learning. And a recent Safe Campus Initiative program called for developing "a support system at Atlantic Cape to effectively respond to potential emergencies and manage crises."

Voila: a class project to develop a data-driven emergency response management system.

Here's how it works: The GIS students spread out across the campus and gather data. When they're outside, students use the Nautiz X7's GPS georeferencing capability to enter data, supplementing the GPS coordinates by cross-referencing locations on aerial campus photographs pre-loaded on the X7.

Inside buildings, they're able to note locations on building floor plans, also loaded on the handheld.

(They're also cross-checking building floor plans against actual layout to find any changes or discrepancies.)

As they establish where they are, they note the location of building entrances and emergency exits; classrooms, laboratories and offices; fire extinguishers, sprinklers and alarms; electrical shut-offs; hazardous materials – anything an emergency responder would benefit from knowing.

They enter their notations directly into the X7 using the ESRI ArcPad program, and also take contextual photos with the handheld's 3-megapixel camera.

After students gather data and store it on the X7, they take the handheld back to a central lab and upload the data to a central server using ArcPad. The next step is to distribute the data. The goal of the program is straightforward: "In an emergency, time is very important. It could be the difference between life and death," Olivieri says. "We are putting together the data required for emergency personnel to act in the fastest possible way."

### **Preparation for worst-case situations**

Olivieri provides some examples – worst-case scenarios, but the kind of situations schools, government facilities or businesses have to be ready for even if the odds are long that they'll ever occur. "Let's say that there's a shooting in a campus building. Before the SWAT team gets there, they know the location of the building and the access points, they have pictures of the inside of the building, they can pinpoint the location where the shooter might be, they know the number of students in the classroom, they have a list of names of the students who are supposed to be in the room then, and they might even have pictures of the students.

"In case they have to open a door, they know which key they need to use to unlock it. Because they have the floor plan of the building and actual pictures taken within the building, they know about potential places where the shooter can hide."

He sums up the usefulness of the system like this: "Typically emergency responders get to the scene and start asking: Who has the floor plans, can we get class lists, what resources do we have. With this system, it's like going there the day before something happens – you already know what you're going to find when you get there."

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