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High-Growth Jobs Initiative

Jun 1, 2004
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Geospatial Solutions

Listen to geospatial technology proponents and you may hear a shared concern -- Applications for the technology are outstripping the development of its workforce. But for the past year, the U.S. Department of Labor (DoL) has been quietly working with the industry, business associations, and academic institutions to address this looming shortage of qualified spatial workers. And time is of the essence. DoL is simultaneously forecasting booming industry growth.

Glossary

DoL: Department of Labor

NSF: National Science Foundation

NASA: National Aeronautics and Space Administration

STIA: Spatial Technologies Industry Association

The unprecedented DoL interest stems from the department's identification of three technologies poised for explosive growth this decade: biotechnologies, nanotechnologies, and our own geospatial technologies. Because of their potential to create jobs and fuel economic growth, all three are now part of a long-term DoL initiative. The High-Growth Jobs Initiative -- one of the Bush administration's top job creation/economic development programs -- means a significant federal investment (as much as $15 billion annually) in technology education. To ensure that the money is targeted at the most needed skillsets, DoL is collaborating with industry and academia to define job and curriculum requirements. And, finally, to validate its growth assumptions pertaining to the geospatial industry, DoL is working with trade associations to craft an agreed-upon definition of the tradecraft. The program is well underway and a consortium of community colleges has already stepped up with a proposal to address workforce training.

What About this Growth?

According to a DoL summary analysis provided to Geospatial Solutions, today's $5 billion market for geospatial technologies is set to explode to $30 billion in just a year. DoL's forecasts were developed in collaboration with industry associations and edu-cational institutions, including the University of Southern Mississippi's Geospatial Workforce Development Center. The Mississippi Center tends to emphasize workforce training for the National Aeronautics and Space Administration (NASA), with special emphasis on remote sensing and image processing and interpretation. This might account for the fact that DoL's $30 billion revenue projection for 2005 was based on $10 billion in GIS and $20 billion in remote sensing. But, as positive as this prediction is, not everyone agrees with it.

"Going up six-fold is a big jump for any market," notes Peter Batty, chief technology officer of Ten Sails, a geospatial consulting and venture capital firm. According to Batty, caution should be applied to the federal numbers.

"It's significant to see geospatial included with nanotechnologies and biotechnologies," Batty says. "But you have to be careful what you include in those numbers."

According to Batty, the traditional GIS market, which mainly includes mapping software, is currently pegged around $1.2 billion in annual sales, rising to $1.4 billion next year.

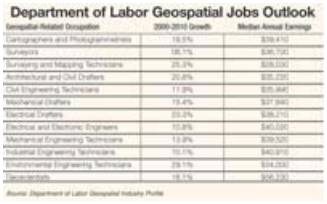
"That's much more modest growth than DoL expects," Batty says. He suggests the cause for such a drama-tic disparity may be DoL's definition of GIS.

"It's much broader than what we traditionally think of. DoL includes a wide range of mapping tools, location tracking, GPS, and other technologies" in its estimates, he continues. Batty adds that geospatial technology is clearly ripe for growth. "But we'll have to see the details" of the DoL analysis to see exactly where this dramatic growth is expected to come from. (At press time, only the summaries were available

of what will be a full report published in mid-June)

Batty points out, an ongoing challenge to placing a value on the geospatial industry: there is no agreed-upon definition of the geospatial industry and what it entails. Thus, he says, accurately forecasting its growth and estimating the number and type of workers that will be needed is a challenging task.

It's a task the Office of Management and Budget is wrestling with right now as well. Results of their work to place a value on the industry is due to be released at a congressional hearing on June 23.


Department of Labor Geospatial Jobs Outlook

Geospatial-Related Occupation	2000-2010 Growth	Median Annual Earnings
Cartographers and Photogrammetrists	18.5%	$39,410
Surveyors	26.1%	$46,700
Surveying and Mapping Technicians	25.3%	$28,030
Architectural and Civil Drafters	20.8%	$35,220
Civil Engineering Technicians	11.9%	$35,840
Mechanical Drafters	19.4%	$37,940
Electrical Drafters	23.3%	$36,210
Electrical and Electronic Engineers	11.8%	$40,030
Mechanical Engineering Technicians	13.8%	$39,520
Industrial Engineering Technicians	10.1%	$40,970
Environmental Engineering Technicians	29.1%	$34,230
Geoscientists	18.1%	$56,230

Source: Department of Labor Geospatial Industry Profile

"Department of Labor Geospatial Jobs Outlook" Table. (Click on image for larger view.)

Geospatial Through the DoL Lens

The Labor Department's portrait of the geospatial industry is indeed expansive and detailed, and suggests that spatial technologies and applications are moving toward the mainstream, as industry leaders have long predicted.

DoL defines the geospatial industry as "an information technology field of practice that acquires, manages, interprets, integrates, displays, analyzes, or otherwise uses data focusing on the geographic, temporal, and spatial context."

This broad definition agrees with that compiled by the University of Southern Mississippi, which worked closely with DoL as it analyzed the industry. But broader input is required to truly determine what technologies and applications should reside under DoL's (and the U.S. Department of Commerce's, for that matter) spatial industry umbrella. That's where the Spatial Technologies Industry Association (STIA) comes in.

Who Do We Count? What is It Worth?

In seeking to more accurately define the geospatial industry, DoL's Assistant Secretary for Employment and Training Emily DeRocco, tapped STIA. She originally met with them during a 2003 Space Foundation meeting in Colorado Springs to lay the groundwork for investigation.

"We were invited to a gathering of industry executives where DeRocco described the jobs initiatives, specifically as it pertains to the geospatial technologies sector," explains STIA President Fred Corle. "We met again in Washing-ton to acquaint her with STIA and its member companies. It seemed like a natural fit for us to work with DoL since our members represent such a broad base of industry sectors."

Soon, STIA began to work with DeRocco on the labor initiative. "She had already scheduled a series of workshops to engage with both industry and academia and look at some of the problems in terms of providing trained workforce," Corle said. He added that the department wanted to help meet what it termed "a clear and growing demand for a well-trained, as well as a widely available, workforce."

"The concerns about a shortfall of employees kept coming up," Corle says. "So we participated in several workshops to address the issue."

But one question that just wouldn't go away, Corle adds, was "What constitutes this industry? What is geospatial and how was it defined?" Therefore, with DoL, STIA has begun to draft a definition of geospatial technology and its industry.

"We are working toward a consensus definition of what constitutes our industry," Corle explains. "What is the primary workforce and what is the secondary workforce?"According to Corle, STIA is engaging with industry and professional societies, as well as other trade associations, to craft that definition, building first on the work that others have done.

"The difference is that we are working with both the DoL and the Department of Commerce to come up with a generally agreed-upon govern-ment?industry definition."

Corle says that STIA's proposed definition should be done and ready for review and final input at the end of

June. When complete, the definition of the geospatial industry will help guide workforce development activities, such as the High-Growth Jobs Initiative.

Initiative Objectives

According to DoL, the High-Growth Jobs Initiative seeks to establish a national leadership structure that matches technology development goals with a trained and skilled workforce that can make DoL's $30 million growth projections a reality. Through collaboration with the spatial community, DoL will craft possible solutions to the workforce issues defined by those closest to the technology: namely, the industry that is developing it.

Multiphased Process

The DoL initiative was structured into a three-phase process. The first phase, which took place about a year ago, was aimed at gathering information by conducting a basic research profile or "industry scan." It also conducted executive forums with workforce and industry leaders.

During this phase, the federal force met with industry representatives who defined their view of the challenges facing the future workforce. "These include getting the right career information to young people while they can still plan their educational path," a senior DoL source explained. Industry also defined its labor pool requirements, and, given the range of careers within the geospatial community, outlined the core competencies for education and training that would be needed. The education establishment must be capable of defining curriculum and programs that provide the necessary training.

This partnership with industry leaders has taken place, and the result has been the emergence of computer models that contain lists of jobs, numbers of potential workers in each field, and where and how institutions can make the requisite training available.

Interestingly enough, when asked if there was a geographic tilt to where these jobs would be needed, the DoL source said regions with NASA facilities topped the list. That means Mississippi, California, Texas, Ohio, Louisiana, Florida, Alabama, Virginia, and Maryland.

STIA played a major role in the industry linkage with the labor initiative, said STIA's Greg Karmazin. "In fact, a number of points raised by STIA were chosen by the workshop participants as priorities," said Karmazin. "Because the High-Growth Jobs Initiative creates so much opportunity to advance our industry, I think it would greatly benefit us to show that we are interested and supportive of this DoL initiative," he added.

Then, DoL moved to the next level, which was described as the workforce solutions forum, where business and industry representatives were brought together, along with community colleges and four-year institutions to vet through the results and perceptions of what their future training needs would be. The DoL source said that the final push would assure that training budget dollars were spent directly at the range of skills and at the institutional level where the efforts would bear the most fruit. Instruments to ensure that success were national models and demonstrations of those solutions.

Based on its findings so far, DoL said a targeted investment in skill and resource development will be made that ensures the development of worker skills in areas of need defined by the industry itself. The department also would then better integrate community and technical college efforts in training programs.

Eventually, potential geospatial workers would have set before them a career path that tells them early in their educational life what courses and skills are required to participate in the high-growth target industries, such as geospatial technology.

The broad purpose of the initiative, according to the senior DoL source, is to help workforce training to be more demand driven. "We want to be sure that, when we train people, our investments are going toward where the jobs are going to be, that we understand the skills and competencies of those jobs and tailor training accordingly," according to the DoL source.

"Most of our money flows through states to local workforce investment boards that are business-driven," the source said. "They make decisions at that level as to how they will invest the funding we provide," which the source described as $15 billion on an annual basis.

Needed: A Geospatial Center?

Over at Jackson State Community College in Jackson, Tennessee, folks aren't waiting for the federal government to identify issues relevant to the future of the geospatial industry. The college, representing a consortium of colleges and universities throughout the country, has proposed to the National Science Foundation (NSF) the establishment of a Center for Geospatial Learning.

"Our proposal is a combination of a virtual and a physical facility, because it's really neither and it's both," explained Tim Sharp, Agriculture Department chair at the college who is leading Jackson State's role in the plan.

Through onsite and distance learning, the project hopes to address two primary needs of the industry: lack of skills and a lack of educational focus on spatial technologies -- an echo of the federal initiative.

"We think there is a major lack of skills in the working world for spatial technologies," Sharp told Geospatial Solutions. "GIS really needs a comprehensive training effort, aimed at specific applications. We don't have that yet."

So why start at the community-college level? Sharp suggested one reason is the extent of such institutions nationwide.

"Community colleges are everywhere, and they are skilled at training folks for the real world, teaching large numbers of students," he added. "The community college system has vast roots."

And the combination of the home-based institutions' strengths and the Internet should yield major advantages. "We're trying to get the best of both worlds by using the economic efficiencies of the Internet," said Sharp, who added that the establishment of the center would aid coordination of training and workforce stability nationwide.

Sharp said NSF has acknowledged the receipt of the proposal, but can't yet give an indication of its prospects for funding. On June 15, he and his partners are going to Washington, D.C. to present their Center for Geospatial Learning proposal to anyone who will listen, including DoL.

"We are already ahead of where they are going," Sharp said. "We aim to solve this problem, whether by national or local means. It's the ability to deliver a national presence at the local level, if they [DoL] will partner with us," Sharp concluded.