

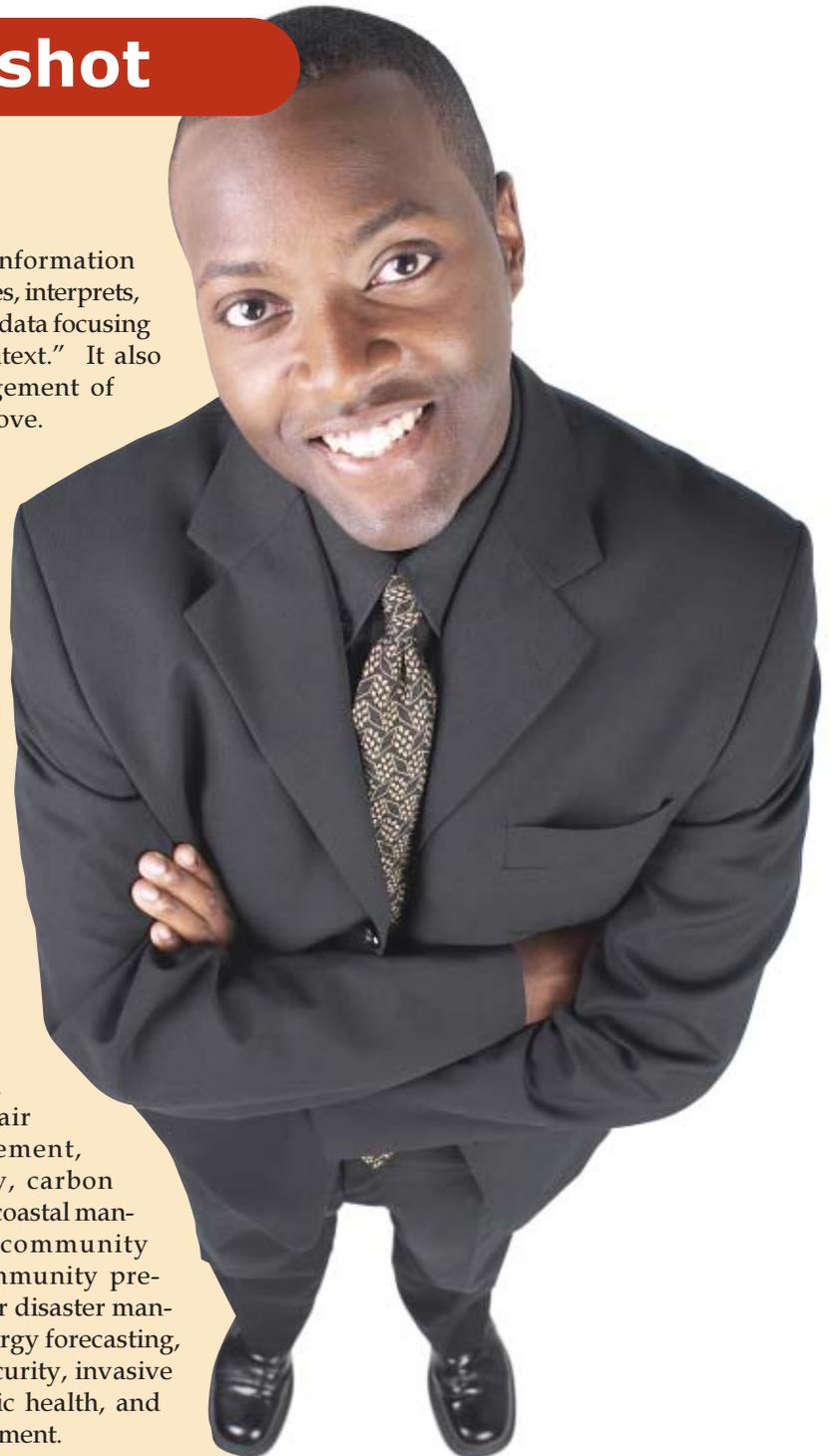
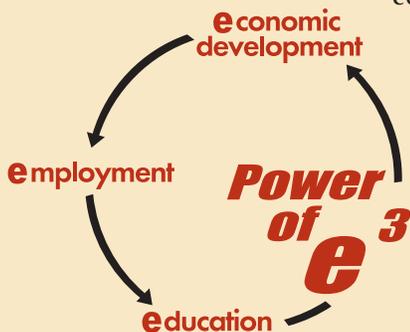


High-Growth INDUSTRY PROFILE

I ndustry Snapshot

Growth Pattern

- The geospatial industry is defined 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.” It also includes development and life-cycle management of information technology tools to support the above. (Source: GeoSpatial Workforce Development Center at the University of Southern Mississippi)
- As of 2002, the current worldwide market for geospatial technologies was estimated at \$5 billion. The market is projected to have annual revenues of \$30 billion by 2005, consisting of \$20 billion in the remote sensing market and \$10 billion in the geographical information systems (GIS) market. (Source: “Building the Geospatial Workforce,” by Annulis, Carr, and Gaudet, 2002 in *Urban and Regional Informational Systems Association Special Education Issue*)
- The NASA Earth Science Applications Program has identified 12 national geospatial applications that are priorities of Congress and the Executive branch. These applications include: agricultural competitiveness, air quality management, aviation safety, carbon management, coastal management, community growth, community preparedness for disaster management, energy forecasting, homeland security, invasive species, public health, and water management.



O ccupational Outlook

Careers in geospatial technology disciplines are available in many segments of commercial, public, government and academic communities. O*NET, the Occupational Information Network, has identified several occupations that may require geospatial competencies, including: cartographers, photogrammetrists, surveyors, civil drafters, electrical drafters, mechanical drafters, aerospace engineering technicians, civil engineering technicians, electrical engineering technicians, environmental engineering technicians, industrial engineering technicians, mechanical engineering technicians, surveying technicians, mapping technicians, soil conservationists, range managers, foresters, geological data technicians, and geological sample test technicians. Other occupations listed by the American Society for Photogrammetry and Remote Sensing include geographers, physical scientists, computer scientists, geographical information systems (GIS), analysts, database administrators, and remote sensing scientists.

Geospatial-Related Occupations	2000-2010 % Projected Growth	Median Annual Earnings	Postsecondary Education & Training
Cartographers and photogrammetrists	18.5%	\$39,410	Bachelor's degree
Surveyors	8.1%	\$36,700	Bachelor's degree
Surveying and mapping technicians	25.3%	\$28,030	On-the-job training
Architectural and civil drafters	20.8%	\$35,220	Postsecondary vocational certificate
Civil engineering technicians	11.9%	\$35,990	Associate degree
Mechanical drafters	15.4%	\$37,840	Postsecondary vocational certificate
Electrical drafters	23.3%	\$38,210	Postsecondary vocational certificate
Electrical and electronic engineering technicians	10.8%	\$40,020	Associate degree
Mechanical engineering technicians	13.9%	\$39,520	Associate degree
Industrial engineering technicians	10.1%	\$40,910	Associate degree
Environmental engineering technicians	29.1%	\$34,000	Associate degree
Geoscientists, except hydrologists and geographers	18.1%	\$56,230	Bachelor's degree

Search and Navigation Equipment Industry
Selected Occupations, 2000

Occupation Title	Total Employment	% of Total
Total geospatial industry	154,300	100.0
Drafters, engineering, and mapping technicians	13,195	8.55
Engineers	44,725	28.99
Computer specialists	12,127	7.86

Guided Missiles and Space Vehicles and Parts Manufacturing Industry
Selected Occupations, 2001

Occupation Title	Total Employment	% of Total
Total geospatial industry	78,990	100.0
Aerospace engineers	13,290	16.82
Engineering managers	2,110	2.67
Computer software engineers, systems software	2,030	2.57
Management analysts	2,010	2.54
Inspectors, testers, sorters, samplers, and weighers	1,870	2.37
Production, planning, and expediting clerks	1,590	2.01

This is not a comprehensive list of occupations. Please refer to the U.S. Bureau of Labor Statistics at links below for more geospatial occupational information.

Search and Navigation Equipment Industry

www.bls.gov/oes/2001/oesi3_381.htm

Guided Missiles and Space Vehicles and Parts Manufacturing Industry

www.bls.gov/oes/2001/oesi3_376.htm

T types of Jobs Created

Skill Sets:

- Occupations utilizing geospatial technologies generally require at least a two-year degree from a technical or community college. There is a substantial demand for technicians in geospatial information technology providing opportunities for individuals who do not wish to pursue an advanced degree. Certificate programs are the most likely course for training. (Source: American Society for Photogrammetry & Remote Sensing web site: www.asprs.org)
- Beginners with postsecondary school training in surveying usually can start as technicians or assistants. With on-the-job experience and formal training in surveying – either in an institutional program or from a correspondence school – workers may advance to senior survey technician, then to party chief, and in some cases, to licensed surveyor (depending on state licensing requirements). (Source: U.S. Bureau of Labor Statistics)
- Individuals interested in geospatial technology careers should take as many science and math courses as possible in high school and throughout their postsecondary educational pursuits.

W orkforce Issues

The overarching geospatial technology industry workforce issues are recruitment, education, and training. The following workforce issues have been gathered directly from senior executives:

- The industry remains focused on four-year and advanced degrees. However, to meet industry growth requirements, and requirements within the applications arena in particular, employers need to examine alternatives to the traditional pipeline. These alternatives include training provided by technical and community colleges. The fastest emerging occupations within the geospatial technology industry require technical skills; however the industry does not have enough training models or curricula to develop the necessary pipeline of skilled workers.
- The industry needs to define the occupational characteristics outside of the four-year and advanced degree levels for individuals interested in entering the field, especially within the applications arena. Those interested in entering the field must also recognize that employers seek employees who possess soft skills as well as technical skills.
- The public is not aware of the necessary skill sets and competencies needed to prepare for the diverse career opportunities available within the geospatial technology industry.

What is the High-Growth Job Training Initiative?

The High-Growth Job Training Initiative is a strategic effort to improve the public workforce system's responsiveness to the needs of the labor market so that the workforce investment system can become demand-driven.

The Initiative is specifically designed to build collaborations among employers, industry leaders, business associations, educators, trainers, the community and technical college system, and the public workforce system.

The purpose of these partnerships is to support models that operationally demonstrate how a demand-driven workforce system can more efficiently serve the workforce needs of business while also effectively help workers find good jobs at good wages.



H

igh-Growth Job Training Initiative

In our efforts to meet the workforce demands of the 21st century economy, the U.S. Department of Labor's Employment and Training Administration (ETA) is conducting forums with various targeted high-growth industries. The Executive Forums are opportunities for senior executives and human capital experts to communicate the critical workforce issues facing their industry.

ETA conducted the Geospatial Executive Forum in Colorado Springs, Colorado, on April 10, 2003. Executives from the following organizations attended the Executive Forum:

- Aerospace Industries Assoc.
- Analytical Graphics, Inc.
- Ball Aerospace & Technologies Corporation
- Boeing Autometric
- California Space Authority, Inc.
- DigitalGlobe
- Eastman Kodak
- Harris Corporation
- Lockheed Martin
- National Aeronautics and Space Administration (NASA)
- Raytheon Company
- Resource 21, LLC
- RSI
- Sensor Systems, Inc.
- Space Foundation
- Spatial Technologies Industry Assoc.
- U.S. Department of Commerce

Workforce Development Forum

To follow up, the Employment and Training Administration and public workforce system representatives met with 30 executives, human resources professionals, community college directors, and industry organization officials representing more than 18 companies, organizations, colleges, workforce professionals and government agency colleagues on July 24, 2003, and July 25, 2003 in Washington, D.C. The purpose of the forum was to discuss the geospatial technology industry's workforce needs and opportunities to partner between the industry and ETA. The following are the geospatial companies and organizations represented at this Workforce Development Forum:

- 3001, Inc
- EarthData
- Fulton Montgomery Community College
- Jones County Junior College
- NASA Center for Distance Learning
- NASA Earth Science Applications
- Navigation Technologies
- ORBIMAGE
- Questerra LLC
- Raytheon Company
- Research Systems, Inc.
- Resource21
- Sensor Systems, Inc.
- The Aerospace Industries Assoc.
- The California Space Authority
- The Harris Corporation
- The Institute for the Application of Geospatial Technology
- The National Imagery and Mapping Agency
- The National Oceanic & Atmospheric Administration
- The Space Foundation
- The Spatial Technologies Industry Assoc.
- The U. S. Department of Commerce
- The University of Southern Mississippi
- Workplace Inc.

Next Steps

ETA is addressing the workforce issues of the geospatial industry from a national perspective by conducting Executive Forums with different sectors of the geospatial industry to gather relevant information from informed groups in a disciplined manner.

These forums will provide ETA and the public workforce system with the opportunity to gain further under-

standing of the overall critical workforce needs of the industry. After meeting with industry leaders, ETA will develop and solidify strategic alliances with business, education, and workforce leaders who are proactively focused on the workforce issues confronting the geospatial industry and engage them in developing innovative approaches to addressing their needs.

ETA is partnering with employers and education providers to develop and model skills training solutions nationally that can be replicated and sustained throughout the state and local public workforce system. These approaches will help ensure that workers have the right skills for the right jobs at the right time.

The ETA In Action

University of Southern Mississippi (USM) Geospatial Technician Apprenticeship Project (GTAP)

Challenge

The geospatial technology industry is an emerging high-growth sector of the U.S. economy that is expected to reach more than \$21 billion in revenue over the next few years. Geospatial technologies include remote sensing, geographic information systems (GIS), and global positioning systems (GPS) technologies. There is an immediate and anticipated need to fill tens of thousands of positions in geospatial technology and related fields.

Addressing the Challenge

ETA's \$1.5 million grant to USM will support the establishment of apprenticeship standards for geospatial technicians. USM and its industry partners will develop state-of-the-art training models and materials to engage the potential geospatial workforce, implement innovative on-the-job and classroom training delivery methodologies, and develop detailed exploration and mapping of career ladders and lattices in the geospatial industry. Importantly, USM will also develop a geospatial training, technical assistance, and capacity-building component for federal, state, and local workforce system partners to ensure that the critical demand for geospatial technicians is met throughout the country.

Sustainable Impact

USM's GTAP pilot represents a timely, demand-driven response to the workforce needs of an emerging and rapidly evolving industry. USM's partnerships with NASA, Lockheed Martin, and regional economic development and technology organizations ensure that the project will continue to be driven by the industry and guided by the industry's developing workforce needs. USM's focus on capacity-building and technical assistance for the public workforce system will ensure that the successful models developed in the GTAP pilot will be widely disseminated, replicated, and sustained through the One-Stop Career Center infrastructure.

N ational Programs

A dditional Resources

Online Tools

Career One-Stop
(www.CareerOneStop.org)

The Career One-Stop is a resource for businesses and job seekers. It contains links to America's Job Bank, America's Service Locator, and America's Career InfoNet.

www.careervoyages.gov
www.doleta.gov

www.high-growth.org
www.onetcenter.org

Other Tools

Toll-Free Help Line
1-877-US2-JOBS (1-877-872-5627)
1-877-889-5627 (TTY)

The Toll-Free Help Line provides up-to-date information about the full range of workforce services for workers and businesses as well as answers to employment and training questions.

Apprenticeship

Apprenticeship is currently working with the geospatial industry to design a geospatial technology apprenticeship program with academic curriculum for the occupation of geospatial technician. This program will encompass skill development in the fields of remote sensing, geographic information systems (GIS), and global positioning systems (GPS) technologies.



C ontact the BRG

For more information on the activities and services of the ETA's Business Relations Group (BRG), please contact:

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