Meet the New Remote Sensing Professionals

New job titles provide employment structure and related skills in this expanding sector of the geospatial industry.

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In 2009, the U.S. Department of Labor Employment and Training Administration (DOLETA) formally recognized the remote sensing field. This came about with the department’s creation of two new standard occupational classification codes for “Remote Sensing Technicians” (19-4099.03) and “Remote Sensing Scientists and Technologists” (19-2099.01). These positions, which are included in the department’s new Geospatial Technology Competency Model—shown in Figure 1 and described on its O*NET website (http://online.onetcenter.org/find/quick?is=remotesensing)—are expected to grow at a rate of up to 13 percent by 2018. By creating and defining these job titles, DOLETA has set the stage for detailing what workers in these positions actually do. This is necessary to identify the knowledge, skills and abilities required, as such requirements typically form the basis for related educational and training programs.

Job Analysis

In 2010, the GeoTech Center (www.geotechcenter.org) at Del Mar College,
Corpus Christi, Texas, reviewed and validated similar DOLETA workforce information for “GIS Technician,” another new geospatial job title. The process used the Developing a Curriculum (DACUM) job analysis technique to precisely determine what geographic information system (GIS) technicians do at their jobs.

DACUM is unique in that it relies directly on panels of “expert workers” to describe and define their own jobs. Because one panel of workers may not adequately represent the diversity of a job at the national level, multiple DACUM job analyses were conducted at various U.S. locations. A unique meta-analytic technique was used to consolidate these job analyses into a single national assessment, which generated a detailed list of job tasks that were identified, validated and ranked by working GIS technicians and related practitioners. The report also identified the knowledge, skills and abilities these workers considered important for their jobs.

This assessment was used to expand and authenticate DOLETA’s list of GIS technician job tasks. It also served as a basis for GeoTech’s model course outlines, which were designed to help the nation’s 164 community college GIS certificate programs prepare students for work as GIS technicians [see “Looking for Geospatial Education?” page 38].

The GeoTech Center has used a similar approach, along with a national industry survey, to help further define and validate the job of “remote sensing technician.” Again the goal was to help clarify exactly what these workers actually do to help identify their common knowledge, skills and abilities.

**Employment Survey**

In 2010, the GeoTech Center began researching remote sensing technicians with a national employment survey conducted during the summer of 2011.

**Most career opportunities in remote sensing are with large government or private-sector organizations.**

A link to the survey was e-mailed to U.S. members of the American Society for Photogrammetry and Remote Sensing (ASPRS), a scientific association serving more than 7,000 geospatial professionals worldwide. Figure 2 shows that survey respondents had a variety of existing and prior job titles or positions, including photogrammetrists, geospatial scientists,
Although the most common job title was “Remote Sensing Scientist,” the variety of positions and job titles cited by respondents suggests there are many ways to advance in the industry. In addition, no clear starting point for entry-level workers is evident, although the DOLETA’s creation of the “Remote Sensing Technician” position may be an attempt to address this issue.

The median age of survey respondents was between 41 and 50, with 14 percent over the age of 60. This suggests that many in the industry are nearing retirement, which should lead to job advancements and additional opportunities for new workers.

In addition, remote sensing workers are highly educated, with virtually every respondent having earned a bachelor’s degree, almost 75 percent a master’s degree and one-third with doctorates. The degrees were from a variety of subject areas, with geography as the most popular followed by geology, environmental science, GIS, photogrammetry, remote sensing and others.

Although a university education clearly is important for these workers, Figure 3 suggests that much of their actual remote sensing training originated from a combination
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The GeoTech Center [www.geotechcenter.org] at Del Mar College, Corpus Christi, Texas, is a collaborative effort among colleges, universities and industry to expand the geospatial workforce. The center’s partners work together to provide professional development, teaching and curriculum resources, career pathways and model core competencies for geographic information system (GIS) technicians and technologists. If you’re looking for geospatial education, check out the center’s GIS program finder at http://216.69.2.35/flexviewer/index.html. Additional information on the service’s Map Interface is online at www.youtube.com/watch?feature=player_profilepage&v=tOhnSNzVDUU.

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California, Virginia, Washington and Florida, which coincides with the location of several large industry employers, including the National Geospatial-Intelligence Agency and the U.S. Army Corps of Engineers in Virginia, as well as U.C. Berkeley and NASA Ames in California.

Meta-DACUM Job Analysis

Along with the employment survey, the GeoTech Center conducted the three remote sensing technician DACUM job analyses in San Jose [2009], Milwaukee [2011] and Denver [2011]. During the course of each workshop, however, panel members identified themselves more as “specialists” than “technicians,” reflecting the greater scope and complexity of their jobs. This was consistent with survey results, which suggested that the job title “remote sensing technician” currently isn’t widely used in the industry.

Results from these analyses, which now documented “remote sensing specialists” instead of technicians, were combined into a single meta-analysis, which involved consolidating 301 job tasks into 74 task groups and 12 task categories. This was done with input and assistance from the Milwaukee and Denver DACUM panels. Figure 4 lists these groups and categories arranged in decreasing order of size to indicate their relative significance to this job.

Manage data was the largest task category, with a total of 60 job tasks organized into 15 groups. This was followed by three roughly equal-sized categories: image processing, manage projects and analyze data. Each represented about 46 job tasks organized into 10 groups. These four task categories accounted for the bulk of all job tasks performed by remote sensing specialists. Additional task categories were professional development, soft skills, field data collection, data creation and editing, photogrammetry, hardware and software maintenance, and light detection and ranging (LiDAR) technology.

Panel members also identified a subset of these task groups as “entry level.” Although there was some disagreement on this, it was evident that entry-level technicians could perform a significant number of these job tasks.

Final Results

The DOLETA’s creation and definition of the “Remote Sensing Scientists and Technologists” and “Remote Sensing Technician” job titles should help to better define a job ladder and provide a structure for employment in this expanding sector of the geospatial industry. At this point, however, there’s no clear entry point for new workers, making it difficult to define the knowledge, skills and abilities they require. One solution is to use entry-level job tasks performed by more senior remote sensing specialists as the basis for defining what remote sensing technicians must know. This would enable educators, students and prospective workers alike to target new jobs in this industry.