**Chapter 7**

**Geospatial Workforce Trends in the United States**

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**ABSTRACT**

Because of definitional problems regarding what is meant by the term “geospatial workforce,” specific reliable data are difficult to obtain about this increasingly important employment sector. This study reviews pertinent literature and U.S. Department of Labor datasets to corroborate the general sense that the geospatial workforce in the U.S. will continue robust expansion well into the next decade. However, because of this strong growth, an imbalance will remain in which demand outstrips supply, particularly in the more sophisticated modeling, design, and research positions, in the geospatial workforce.

**INTRODUCTION**

The purpose of this study is to bring together pertinent information that may be useful in better understanding the future trends of the geospatial workforce in the United States. To reach this objective, the research is largely a literature review of geospatial workforce trends in the U.S. and a distillation of the germane themes and data from these sources.

“Geotechnology” and “geospatial skills” are terms synonymously used for geographic information science (GiScience), which includes the academic specializations of geographic information systems (GIS), remote sensing, cartography, visualization, spatial modeling, global positioning systems (GPS) technologies, and surveying. Although cartography is the oldest of these specializations, GIS is the most well known and most widely utilized in government and business. These GiScience specializations are increasingly linked with each other, producing new and robust analytical methods (Daratech Reports, 2003; DiBiase et al., 2006; ESRI, 2009; Goodchild, 1997; Thrall, 2005; U.S. DOLETA, 2005).

The components of GiScience have become powerful geospatial research and operations tools in both the public and private sectors. The myriad of uses of these geospatial tools include major socioeconomic categories: homeland security, energy, telecommunications, healthcare, crime prevention, agriculture, transportation, and real-time business decisions (U.S. DOL, 2009; U.S.
DOLETA, 2005). The significance of geospatial analysis will become increasingly greater as more materials, products, goods, services, and people are tracked through space. Yet, echoing the conclusion of a group of GIScience experts in 2001 that data are scarce regarding geospatial workforce supply and demand (DiBiase et al., 2006), Marble (2006) complained that little had changed by 2006 and that this lack of supply and demand data constrains the rational nurturing and management of the geospatial workforce in the U.S.

In response to such longstanding criticisms about the understanding and management of the geospatial workforce, two forums of geospatial experts and stakeholders, gathered together by the U.S. Department of Labor (US DOL), the Geospatial Information and Technology Association (GITA), and the Association of American Geographers (AAG), in October 2005 and January 2006 discussed fundamental issues regarding the geospatial industry. The first task was simply to define the geospatial industry, those entities that use GIScience to reach their goals, because the term “geospatial” had become exceptionally nebulous, encompassing many academic disciplines and perspectives. After lively debate and suggested definitions put forth, the group of experts from both the public and private sectors recommended that the US DOL adopt the definition: “the geospatial industry acquires, integrates, manages, analyzes, maps, distributes, and uses geographic, temporal and spatial information and knowledge. The industry includes basic and applied research, technology development, education, and applications to address the planning, decision-making, and operational needs of people and organizations of all types” (US DOL, GITA, & AAG, 2006, p. 8).

GENERAL GEOSPATIAL WORKFORCE INDICATORS

Influential agencies in the federal government, innovative business firms, leading university geography departments, and attentive professional associations have had the general sense during the past decade that the growing geospatial workforce will demand substantial numbers of employees well into the future. Perhaps the most quoted of these geospatial workforce projections appeared in a 2004 issue of the prestigious international journal, Nature, which recognized “geotechnology as one of the three most important emerging and evolving fields, along with nanotechnology and biotechnology” (Gewin, 2004, p. 376). The Nature article was based on projections by the U.S. Department of Labor, the preeminent federal agency for workforce data that continues to consider geospatial technology, particularly GIS, as a “high growth industry” (US DOL, 2009). More specifically, the US DOL agreed with the GITA assessment of the overall expansion of the geospatial workforce and highlighted on its Web site: “Because the uses for geospatial technology are so widespread and diverse, the market is growing at an annual rate of almost 35 percent, with the commercial subsection of the market expanding at the rate of 100 percent each year” (US DOL, 2009). The National Aeronautics and Space Administration (NASA) has indeed predicted that geospatial technologies will change the way Americans live and work as much as the computer revolution has in the past fifty years (Gaudet & Annulis, 2008; US DOLETA, 2005).

The remarkable growth in business geospatial jobs, specifically in spatial modeling, GIS, remote sensing, and visualization work in site analysis, real estate, marketing, and tracking systems, portends a geospatial workforce in the private sector that has the potential of becoming the largest geospatial employment market in the early decades of the 21st century (Barnes, 2004; Hartung, 1997; Lowe, 2005; Reid, 2004; Thrall...