

NGAC Geospatial Workforce Development White Paper Summary

In January 2012, the National Geospatial Advisory Committee (NGAC) adopted a white paper on Geospatial Workforce Development. This summary provides an overview of the paper and recommendations. The full white paper is available at: <http://www.fgdc.gov/ngac/ngac-geospatial-workforce-development-paper-final.pdf>

Overview

The United States is a world leader in geospatial technology and research, an area that represents a multi-billion dollar sector of the US economy. This high growth, high technology industry acquires, manages, analyzes, integrates, maps, distributes, and uses geographic, temporal, and spatially based information and knowledge to fuel major sectors of the US economy. This vital industry faces a serious workforce development challenge. A shortage of qualified and skilled workers exists to meet the demands of this fast growing industry. Efforts must be undertaken across government, private sector, academia, and industry associations to prepare workers to take advantage of new geospatial job opportunities in high demand and economically vital sectors of our economy.

This white paper was developed by the NGAC Geospatial Workforce Development Subcommittee, which includes representatives from multiple sectors of the geospatial community. The paper describes the challenges and advancements with geospatial workforce development to set a context for further discussions. The paper addresses three topic areas and includes associated findings and recommendations. The three topics include:

1. Science, Technology, Engineering, and Mathematics Education Initiatives

This section examines the opportunities for synergies with the Administration's Science, Technology, Engineering, and Mathematics (STEM) education initiatives, and assesses opportunities to incorporate Geospatial and Geomatics education into the STEM categories. The Department of Labor (DOL) identified geospatial technology as one of 14 sectors "projected to add substantial numbers of new jobs to the economy or affect the growth of other industries or are being transformed by technology and innovation requiring new sets of skills for workers."

Despite this amazing industry growth and innovation, and congruence with all aspects of STEM, few educational programs integrate geography and geospatial education within the STEM curriculum. The inclusion of geospatial disciplines in the White House STEM initiatives would increase the probability that the initiatives will be more successful, as well as illuminate the importance and benefits of developing a highly skilled geospatial workforce.

2. Department of Labor's Geospatial Competency Model

This section reviews the DOL's Geospatial Competency Model for assisting organizations to better prepare for the future. The competency model is a tool for performing gap analysis to assist in succession planning, knowledge management and transfer, employee development, and work or organizational change.

The shortage of trained geospatial technology professionals reflects a number of issues among the geospatial profession and the industries it serves. Among these issues, geospatial technology is used in hundreds of fields, but despite its adoption, there is a lack of awareness regarding geospatial technology and related career opportunities. As a result, training and educational programs have been unable to meet the growing demand. This has resulted in a lack of consistent curricula, standards, and credentials within the profession. The application of the geospatial competency model can provide a common language among employers, educators, human resource professionals, and the like to address these issues.

3. Standard Occupational Classification Codes and Federal Occupational Series Classifications

This section evaluates the need for revising and updating both the DOL's Bureau of Labor Statistics (BLS) and the Office of Personnel Management (OPM) occupational classifications. These classifications assist in federal, public, and private sector workforce development through the development of guidelines which outline general responsibilities, qualifications, and characteristics for particular fields of employment.

In an effort to guide recommendations regarding geospatial workforce development in public and private sector, a comparative analysis of both occupational codes is suggested to determine opportunities for revision. These revisions would focus on the sector areas where the occupational codes may best address recent changes in technology, operations, and current geospatial competencies.

Summary of Recommendations

The following includes a summary of recommendations from each of these white papers.

- 1. Identify synergies with the Administration’s Science, Technology, Engineering, and Mathematics (STEM) education initiatives, assess opportunities to incorporate Geospatial and Geomatics education into the four STEM categories, and assess potential role/involvement/support from FGDC and NGAC.**
 - 1.1 The FGDC leadership should work with and encourage CoSTEM to include geospatial technology and geomatics as components of the STEM disciplines.
 - 1.2 The FGDC Secretariat and agency members should review and comment on the results of the CoSTEM Inventory of Federal STEM Programs and the CoSTEM Report on Federal Coordination.
 - 1.3 The FGDC leadership should encourage awareness among FGDC member agencies regarding the importance of opportunities for geospatial technology related grants, such as the NSF’s Geography and Spatial Sciences Program and NOAA’s Cooperative Remote Sensing Science and Technology Center. Consider inviting NSF and NOAA to brief FGDC on how this model may be applied at other departments and agencies.
 - 1.4 The FGDC leadership should encourage FGDC member agencies to establish internship, fellowship programs, cooperative education, or exchange programs that give students practical understanding and real-world experience with geospatial technology and applications.
 - 1.5 The FGDC leadership should encourage FGDC member agencies to support geographic literacy through their respective education and outreach programs.
- 2. Utilize the DOL Geospatial Competency Model to meet Federal/State/Local/Tribal Government needs for assisting in succession planning, knowledge management and transfer, employee development, and work or organizational change.**
 - 2.1 The FGDC should collaborate with UCGIS and AAG to determine if the Body of Knowledge for GI Science and Technology’s knowledge areas encompasses the breadth of the geospatial technology field from a government perspective.
 - 2.2 The FGDC should work with the geospatial community to develop a communication infrastructure and methods to facilitate geospatial information exchange, such as a website to improve communication.
 - 2.3 The FGDC Secretariat should follow up with UCGIS and the Department of Labor on the status of the partnerships for developing mutual goals and programs to establish a clearinghouse for internship, work experience, and service learning programs; and the GeoTech Center on building partnerships for developing a competency model for a program of study that provides guidelines for geospatial education programs.
- 3. Update externally” focused [GIS themed] SOC Standard Occupational Classification Codes and “Internally” focused Federal Occupational Series Classifications.**
 - 3.1 The FGDC should partner with the DOI Office of Human Resources to engage OPM in an effort to review, update, and modernize the geospatially-oriented Federal Occupational Series Codes (including the Cartography, Cartographic Technician, Surveying and Geodesy series). The revisions to the Federal Occupational Series Codes should incorporate themes and approaches from the Competency Model.
 - 3.2 FGDC, DOL, and the Federal human resource management community should collaborate with non-federal partners to encourage the use and adoption of the Geospatial Technology Competency Model and the updated Occupational Classification Codes and Series.
 - 3.3 FGDC partner agencies should communicate with their academic partners about the revised occupational codes and competency model to facilitate development of appropriate training and curricula to address emerging geospatial workforce needs.