Empowering Colleges: Expanding the Geospatial Workforce

Defining What The Geospatial Workforce Needs to Know

Focus on Diversity, Equity and Inclusion

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Generalized Titles For User Levels

10,000,000
100
1,000
10
1,000,000
1

Viewers /Virtual Users
Scientist
Analyst
Specialist
Manager
Technologist
Technician
Task Specific User

Ratio of Users by Level

Geospatial Workforce and Users of the Technology
All Competencies For User Levels

Generalized Titles For User Levels

Ratio of Users by Level

- 1
- 10
- 100
- 1,000
- 1,000,000
- 10,000,000

Viewers /Virtual Users

Task Specific User

Technologist Technician

Scientist

Analyst

Manager

GEO

Technician

Specialist

Increasing Geospatial Knowledge
Proficiency Levels For Different Users

Increase DEI for Users

Viewers /Virtual Users

Task Specific User

Technologist

Specialist

Manager

Scientist

GEO

Ratio

10,000,000

100

10

1

1

10

100

1,000

1,000,000

10,000,000

Geospatial Competencies

Occupation Specific Competencies

Issue of Knowledge Level for increasing DEI

What specifically do you need them to know to be successful?
Filling the Geospatial Knowledge Bucket - Nine Competency Categories

1. Conceptual Foundations including Spatial and Critical Thinking
2. Geospatial Data Fundamentals
3. Data Acquisition
4. Database Design and Management
5. Geospatial Analysis
6. Cartography and Visualization
7. Application Development
8. Remote Sensing Fundamentals
9. Professional Practice

Note: acknowledge use of similar terms and language from GISCI, GTCM and UCGIS Body of Knowledge
Focus on DEI - skill levels and competency requirements still depend on employee work assignment

Example from Category 1 – Conceptual Foundations

1: **Aware** of critical and spatial thinking related to spatial patterns in places and timeframes for applications but cannot apply them independently

2: **Understand** use of critical and spatial thinking related to spatial patterns in places and timeframes for applications and can **apply** them with **signification guidance**

3: **Ability to use** critical and spatial thinking to analyze and evaluate patterns in places and timeframes for applications with **minimal guidance**.

4: **Ability to** use critical and spatial thinking related to spatial patterns in places and timeframes for different applications **without assistance** and **create** possible new methodology
List of Skills and Competencies

- **Personal Assessment Tool**
  - Worker does a “Self Assessment”
- **Matching skill levels based on needed knowledge**
- **Customize the list for specific workforce user level**
- **Use it to identify strengths and weaknesses**
Resources Used to Create a List of Skills and Competencies
USA Department Of Labor Geospatial Technology Competency Model - GTCM

- Interactive 3D Model
- GTCM Updated in 2022/23 with industry input
  - provides one source for defining the skills and competencies needed by the workforce
- Tier 4 and 5 lists specific geospatial skills and competencies
- Tier 5 divided into 3 areas: Data Acquisition, Analysis, and software development

https://www.careeronestop.org/competencymodel/competency-models/geospatial-technology.aspx
Another Source Of Industry Input - a DACUM “Developing a Curriculum”

- Two-day intensive workshop where geospatial workers are asked to tell what they do and define what they need to know to do it
- Outcome is a DACUM chart
- Multiple DACUMS have been combined creating a MetaDACUM

New DACUMs will continue to be carried out and an updated MetaDACUM published
GeoTech Center Webpage
geotechcenter.org

Resources to help fill in the knowledge gaps

Assessment Tool
10 Model Courses
Concept Module PPTs
Demonstration Videos
Learning Modules
MOOC ‘s
Concept Modules – Video Review of Important Concepts

- Artificial Intelligence, Machine Learning, Deep Learning & Internet of Things
- Data Management and Metadata
- Data Visualization and MAUP, Colors
- Map Projections, Datums, Scale
- Ethics
- Excel and CSV tables – hints and tips
- Mathematics and Statistics
- Geocoding
- Programming
- Remote Sensing
- Topology
- US Census

https://www.geotechcenter.org/concept-modules-and-demonstration-videos8203.html
Thank You!

- Please contact me if you need help finding a resource or if you have suggestions for a resource you would like the GeoTech Center to create or improve!

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