

GEOSPATIAL WORKFORCE SURVEY FINAL REPORT

2022



Maine **MGI**
Geospatial Institute

SURVEY BACKGROUND

The 2022 Maine Geospatial Institute Workforce Survey was led by Dr. Tora Johnson in winter-spring 2022.

Individuals were invited to participate in the survey via email. They were asked to provide information about their needs and interests related to training in mapping technology such as GPS, geographic information systems, web-based mapping technologies, remote sensing technologies, etc. The survey included people (18 or older) who work in fields in which mapping software and other geospatial technologies are commonly used or may be useful. The survey invitation also indicated interest in hearing from people who are interested in adding mapping skills to their resumes. The goal of this research was to build new cutting-edge, affordable, and accessible professional development opportunities. The survey was intended to take no more than approximately 10-15 minutes to complete. This study was confidential, with contact information kept separate from survey answers. Survey data was deleted from the online survey system on or before June 1, 2022, and stored on password protected, encrypted computers owned by the University of Maine System. All research data and materials will be

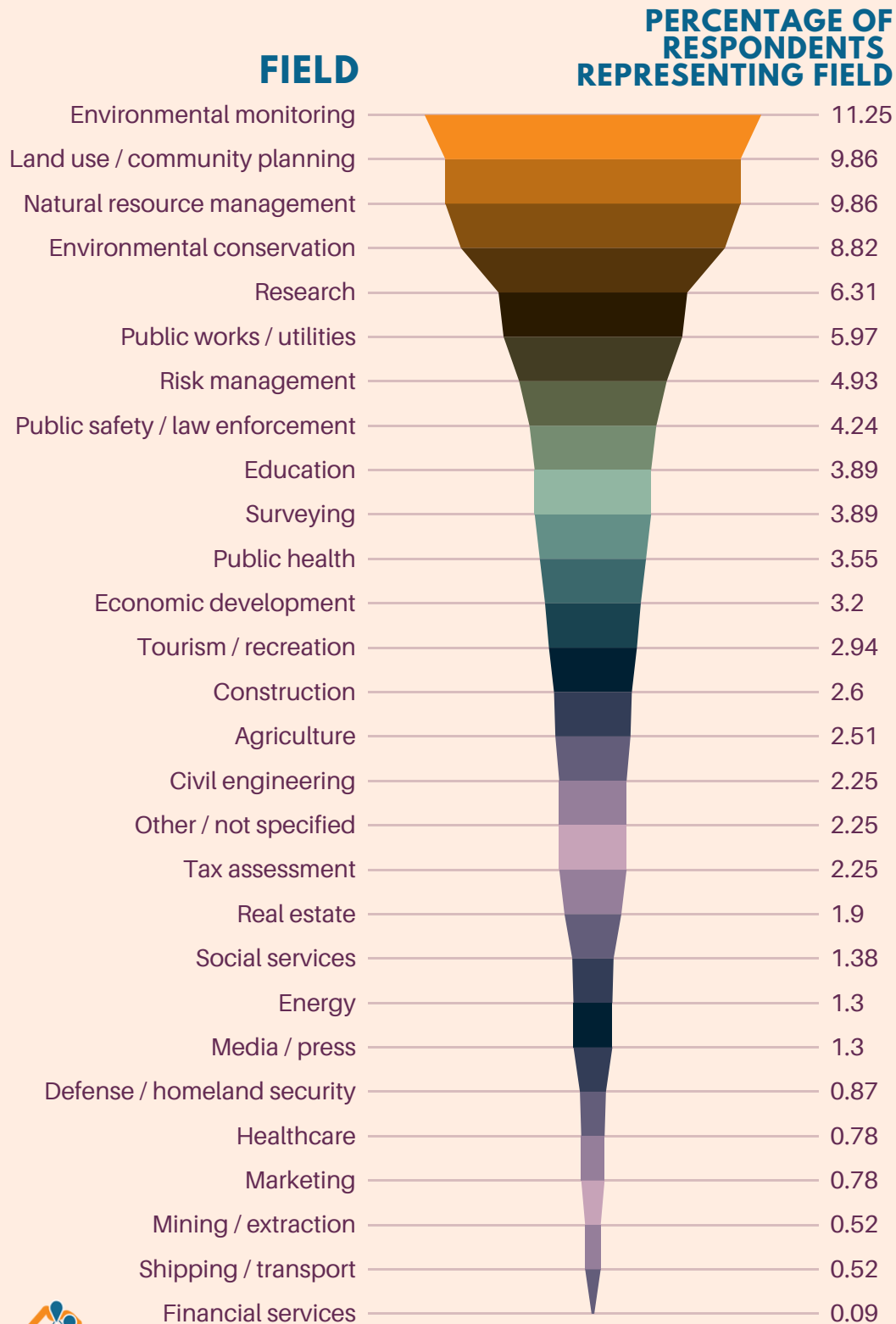


destroyed on or before January 1, 2027. This survey had no direct benefit to respondents, however the research will help to create convenient and useful professional development opportunities for respondents and people in the field. No compensation was made for participating, nor were there any anticipated risks to respondents. Participation was entirely voluntary and respondents were permitted to skip any question they chose not to answer.

In addition to survey leader Dr. Johnson, who developed questions and served as the subject matter expert, team members were Michael Packer, student intern; and Eileen Moran, coordinator for the Maine Geospatial Institute, who also prepared this report.

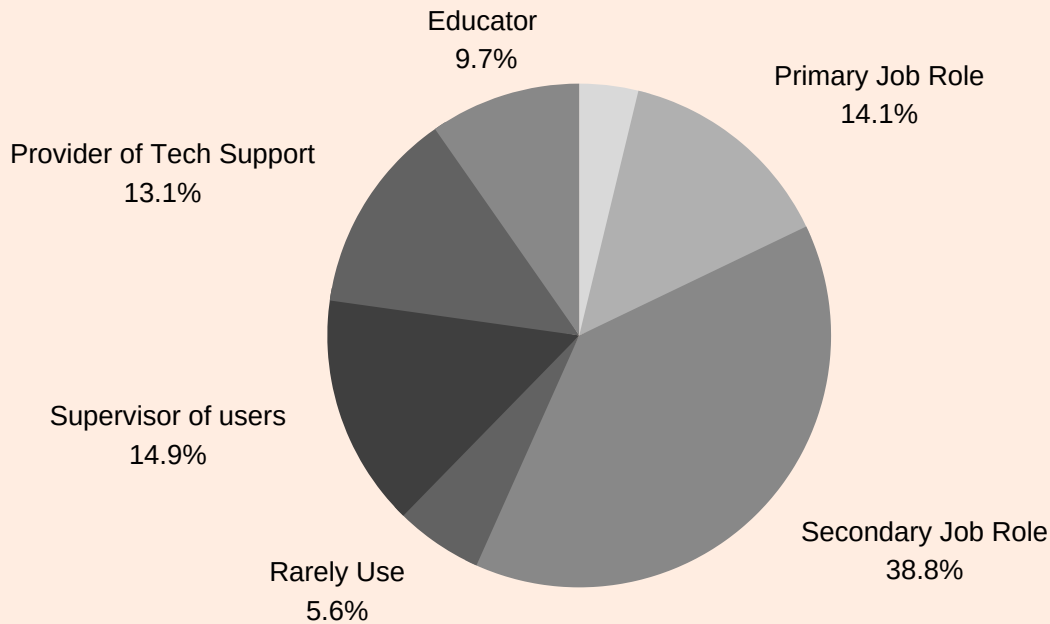
Dr. Johnson may be reached at tjohnson@maine.edu; Eileen Moran may be reached at eileen.moran@maine.edu.

Respondents indicated that they work in the following fields:



SURVEY RESPONDENTS

Our 271 respondents identified with the following categories of geospatial technology users.



59%

of the respondents who indicated they are an employer or a supervisor of workers using geospatial technology requested further interaction with the Maine Geospatial Institute to arrange professional development opportunities for employees.

68%

of respondents requested further interaction with MGI through a professional development mailing list.

80%

of respondents indicated that geospatial technologies are very important to the work of their firms, organizations, and agencies in the future.

This is an increase from a survey conducted in 2007 (see page 13) for which 69% of respondents indicated geospatial technologies are very important to the work of their firms, organizations and agencies in the future.



TRAINING NEEDS

Respondents indicated that professional development pathways and training across varying topics and levels of complexity are needed. Respondents broke down their immediate needs as follows:

Training Topic	% Seeking Immediate Training
Effective map design & communication	59.71
ArcGIS software	58.33
Web-based mapping	56.63
Map analysis	56.06
GPS / field data collection	52.74
Basic computer map-making / GIS	52.74
Awareness of computer map-making	51.56
Remote sensing / image analysis	42.19
Open-source geospatial software	40.10
Python Scripting	38.46
Drone piloting / data processing	34.76
Municipal land records mapping	34.36



DESIRED DELIVERY FOR TRAINING

Results indicate that as the complexity of the topic increases, so does the desire for focused, live, in-person educational opportunities. The desired delivery for more simple training needs were predominantly self-paced and web-based.

Delivery Mode for Those Seeking Immediate Training	Percent of respondents who prefer for BASIC topics	Percent of respondents who prefer for COMPLEX topics
Web-based classes/ workshops without live meetings	66.39	16.81
Self-paced modules/ tutorials	58.06	30.24
Live, web-based classes/ workshops	50.79	38.1
Blended classes/ workshops with in-person & web-based instruction	25.61	50
In-person at your workplace	18.1	51.29
In-person away from your workplace	16.8	47.79



DESIRED TIMEFRAME FOR TRAINING

Respondents indicated varying preferences of duration based on difficulty. For basic topics, the highest percentage indicated a preference for short, quick individual lessons (1 to 2 hours); for complex topics, the highest percentages went to all-day intensives, followed fairly closely by multiple weekly classes/ workshops of 1 to 2 months.

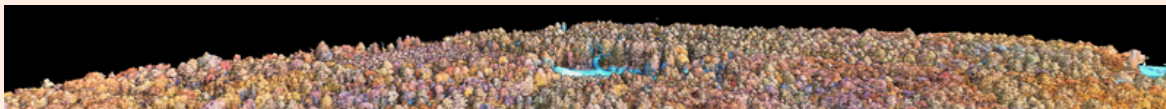
Duration of Delivery	Percent of respondents who prefer for BASIC topics	Percent of respondents who prefer for COMPLEX topics
Short, quick individual lessons (1 to 2 hours)	65.37	30.74
All-day intensive	23.33	54.17
Week-long boot camp	9.50	37.56
Multiple weekly classes/ workshop- 1 to 2 months	22.58	47.58
Semester-long classes/ workshop- ~3 months	13.79	38.79



IMPORTANCE OF THE FOLLOWING TYPES/LEVELS OF LEARNING

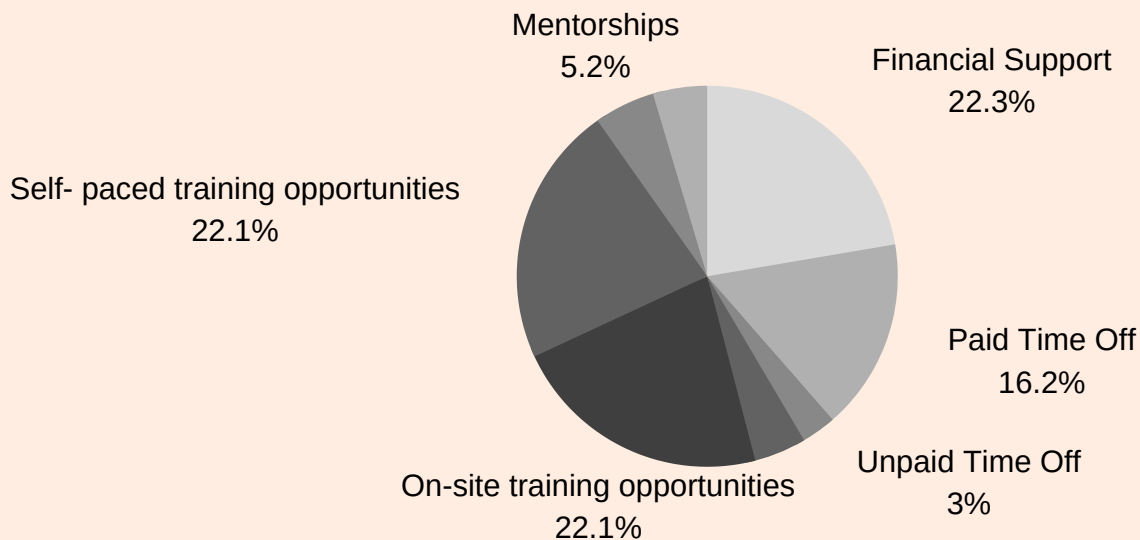
Among respondents, Just Learning The Skills was by far the dominant importance. It is important to note that this study targeted incumbent workers who likely already possess basic credentials suited to their field. It is believed that a survey of current or future job seekers and those seeking GISP* certification would be more likely to prioritize credentials and badges.

What is your goal?	Extremely Important	Very Important	Slightly Important	Not Important
Just learning the skills	57.34	37.16	4.59	0.92
Continuing education credits (CEUs)	6.05	13.02	43.72	37.21
Badges/ microcredentials	0.95	8.57	35.24	55.24
Non-academic certificate	2.35	5.63	47.89	44.13
Undergraduate college credit	1.90	9.95	22.27	65.88
Graduate college credit	4.23	14.08	26.76	54.93
Academic certificate	4.67	14.95	33.64	46.73
Undergraduate degree	4.74	12.32	18.01	64.93
Graduate degree	5.71	12.86	23.33	58.10



PROFESSIONAL DEVELOPMENT SUPPORT FROM EMPLOYERS

Respondents provided insight into the support they receive from employers to obtain training as follows.



Notes: Free form response add-ons included that some do not receive professional development support, and that there is often a component to receiving support that content be relevant to one's job role and employer priorities. See Survey Comments on page 12 of this report.

While more than **60%** of respondents indicated that they plan their professional development any time of year; 25% indicated winter is the dominant time of year for them, followed by summer (7%), spring (3%), and fall (2%).

80%

Prefer to participate in training of weekdays during the daytime.

60%

would be unwilling to do weekend training.

20%

Prefer weekday evenings for training.

More than **74%** of survey respondents indicate that they learn about professional development opportunities via emails from colleagues or professional associations. Employer emails (15.38%), and social media (4%) were other methods, as well as websites, listservs, and online forums.

SURVEY DEMOGRAPHICS



More than 63% of respondents are employed by government at the municipal, county, state, or federal level. Respondents employed in the education sector came in as the next highest percentage of respondents at 12.5%; the non-profit sector was selected by nearly 10% of respondents; and private industry was selected by just over 8.5% of respondents.

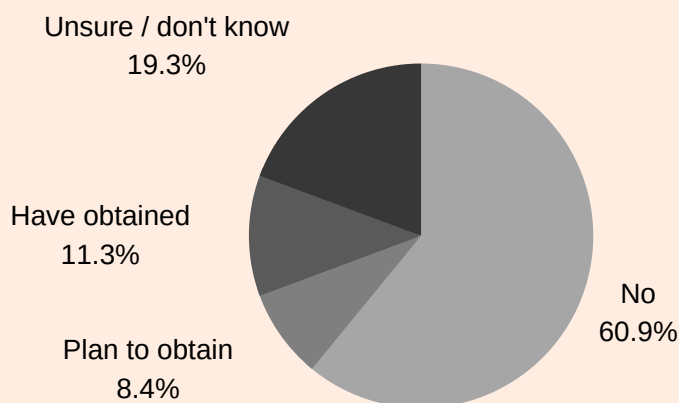
Respondent Discipline / Sector	%
State government	36.79
Municipal government	21.79
Non-profit	9.64
Higher education	9.29
Small private industry (firms under 100 workers)	5.00
Self-employed	3.93
Large private industry (firms over 100 workers)	3.57
Secondary or primary education	3.21
Federal government	3.21
County government	1.79
Retired	1.43
Not employed	0.36

SURVEY DEMOGRAPHICS



Age Range	%	Education Level Achieved*	%
18 - 24	1.81	Less than high school	0.00
25 - 34	19.46	High school graduate	0.90
35 - 44	22.17	Some college	2.26
45 - 54	24.89	College certificate	0.45
55 - 64	24.89	Non-academic certificate	0.90
65 - 74	6.79	2 year degree	1.81
		4 year degree	42.08
		Professional degree	42.53
		Doctorate	9.05

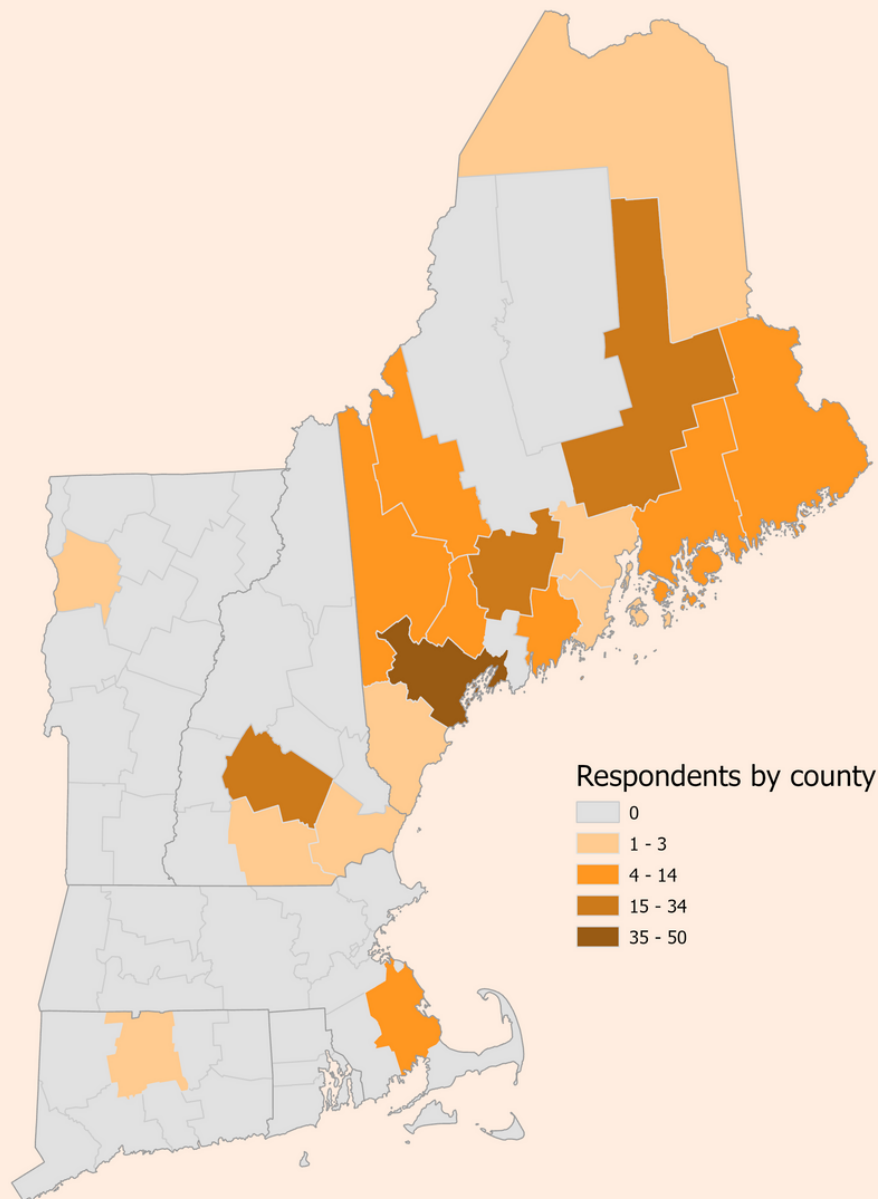
Percentage of Respondents planning to get one or more professional certifications in geospatial technology, e.g. GISP, ASPRS, surveying certification, etc.



*There was an inadvertent oversight in the survey in that it failed to include master's degree as a choice.

SURVEY DEMOGRAPHICS

2022 University of Maine GIS Workforce Study New England Survey Respondents



Created by Mike Packer
6/16/2022

Respondent data was generated from the 2022 Workforce Study survey responses;
state and county boundary data was downloaded from the U.S. Census Bureau
Projection: NAD 1983 UTM Zone 20

SURVEY COMMENTS

Respondents provided these additional comments at the conclusion of the survey.

On the need for geospatial training, particularly in mapping skills:

"I would love to participate in GIS professional development opportunities."

My work team and I rely on our GIS professionals for mapping, but am always eager to learn how to make the best use of geospatial data."

"Please let me know how can I get these pieces of training. I am highly interested to be an expert in this sector."

"I am highly interested! Would love to learn the "how to's" and maybe introductory elements to bring to my students (middle schoolers 6th - 8th)."

On the need for geospatial training on an on-going basis:

"An organization needs to plan for repeated, cyclical training at basic, intermediate, and advanced levels, at least every three years. A one-time course may help the employees at that time, but three years later, new employees and advancing employees need to have the opportunity to take ... courses in order to "refresh" and build the organization's skills."

"Geospatial data is imperative to my project and profession. Having more people trained and engaged in this technology in Maine would be extremely beneficial. There is potential for this sector to grow and support additional jobs."

"Need workshops with remotely available staff who know the software, etc. So many online and packaged programs have glitches with no real person available in a immediate fashion."

On the challenges and frustration of workplace barriers:

"The software we use has an integrated GIS component, but our IT department either isn't interested, or isn't capable to make it work in any useful way. I feel GIS and mapping data would not only help us better understand our city, but would also bring up questions we don't yet know to ask."

"I think this is valuable, but my direct supervisor does not think it's worth investing in."

"If training were to be offered to our municipality, please be sure to specify certain departments that would benefit from this because HR is not attuned to specific needs of departments."

"At the state level, the transition to ArcPro has been frustrating. So, it's not just about professional development, but also working at optimal performance with technology that's available."

On the need to "upskill" and apply geospatial technologies to other careers:

"I think to ignore the use of geospatial technology in existing geospatial-oriented professions like surveying and engineering in favor of simply GIS jobs would be an unfortunate repeat of past weaknesses in education. Geospatial use in jobs goes well beyond just using GIS software. For instance there is a tremendous use of geospatial concepts, tools, data, etc. in the CAD profession. It remains a largely untapped area/population to cater to."

"We ... hire permitting and planning staff with varying levels of GIS capability when they arrive. Additional training in GIS is always requested as we use it in multiple ways."

COMPARING TO PAST FINDINGS



A workforce study was conducted in **2007-2010** by Dr. Matthew Bampton, Dr. Tora Johnson and Dr. Charles Colgan. It was initiated with a survey titled *Assessing the Need for Geospatial Technology Education in Maine* and results were compiled in September 2007. Ninety-four people responded to the preliminary survey, nearly all of whom worked in Maine in fields in which geospatial technology is commonly used. The largest groups of respondents worked in non-profits, state government, local government, and higher education. Respondents lived and worked in all but one Maine county. The study later included literature review, focus group interviews, and a broadening of the preliminary survey.

Some Comparisons:

In **2007-2010**, over half of the respondents (54%) used geospatial technology in their work either often or rarely, but geospatial technology was not their primary work responsibility. For 38%, their work focused primarily on geospatial technology. While the **2022** survey queried respondents in a slightly different way, it similarly found that a large proportion of the respondents use geospatial technologies as an additional skill in a non-geospatial field.

In **2007-2010**, land use/ community planning, natural resource management, environmental conservation, and urban/ regional planning were by far the most common uses of geospatial technologies among respondents. The **2022** survey revealed that current uses of geospatial technologies in the workforce are more diverse, reflecting wider adoption across governmental agencies and commercial applications.

In **2007-2010**, about half of survey respondents indicated that they had access to needed geospatial technologies education; one-quarter said they did not. Forty percent of those who used geospatial technologies rarely in their work said they do not have access to the education they need. In the **2022** survey, about two-thirds of respondents indicated they have unmet needs for training,

In **2007-2010**, courses blending internet-based and occasional on-campus activities were the most preferred course format. More than 80% of respondents felt traditional 16-week daytime courses were inaccessible, inconvenient, and/or not useful. In **2022**, preferences changed significantly, reflecting increasing comfort with online and asynchronous learning, but showing a continued preference for blended, synchronous, and/or in-person formats when learning complex skills. 2022 results indicated that traditional college course formats were still largely considered less useful, but preferred by some for learning more difficult skills.