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The Need for Environmental Public Health Professionals and the Role of EHAC-Accredited Programs in Increasing the Pool

Editor's Note: In an effort to promote the growth of the environmental health profession and the academic programs that fuel that growth, NEHA has teamed up with the Association of Environmental Health Academic Programs (AEHAP) to publish two columns a year in the *Journal*. AEHAP's mission is to support environmental health education to ensure the optimal health of people and the environment. The organization works hand in hand with the National Environmental Health Science and Protection Accreditation Council (EHAC) to accredit, market, and promote EHAC-accredited environmental health degree programs. AEHAP focuses on increasing the environmental health workforce, supporting students and graduates of EHAC-accredited degree programs, increasing diversity in environmental health degree programs, and educating the next generation.

This column will provide AEHAP with the opportunity to share current trends within undergraduate and graduate environmental health programs, as well as their efforts to further the environmental health field and available resources and information. Furthermore, professors from different EHAC-accredited degree programs will share with the *Journal's* readership the successes of their programs and the work being done within academia to foster the growth of future environmental health leaders.

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Introduction

As early as 1990, Larry Gordon was communicating concern for the nation's health and a potential decline in the rate of improvement in U.S. environmental health due to a decline in the number of and/or a lack of awareness of the value brought by interdisciplinary-trained environmental health science practitioners to public health problems (Gordon, 1990).

His concerns have again been echoed more recently in governmental decision making related to current environmental public health affairs (Goldstein, Kriesky, & Pavliakova, 2012). The likely cause for the absence of environmental health as pointed out by Gordon (1990) is a growing disconnect between life, physical, and health scientists failing to receive adequate interdisciplinary training needed to solve the

complex public health problems of today both domestically and abroad. Emerging from the expectations set forth by Gordon (1990), core competencies were established for environmental health practitioners (American Public Health Association & Centers for Disease Control and Prevention, 2001), which have continued to evolve.

The efforts of establishing and maintaining the essential interdisciplinary framework that includes the requisite coursework related to air, water, and food quality as well as epidemiology, toxicology, chemistry, biology, and much more are of little value to the public health workforce unless the training is actually provided to future practitioners. The need for a skilled environmental health workforce has been well articulated over the last decade by the broad public health community (Council for State Governments & Association of State and Territorial Health Officials, 2004; Perlino, 2006), and the shortage has resulted in at least temporary additional federal investment in training above and beyond the previous support for improving the nation's public health surveillance workforce (Drehobl, Roush, Stover, & Koo, 2012). If the workforce shortage continues or grows, the environmental health positions will still be filled, but possibly with biologists, wildlife/conservation scientists, zoologists, and maybe even nonscience personnel, all of whom may have little or no public health background. An interdisciplinary-trained environmental health professional is the desirable choice, however, in filling environmental public health positions.

The questions now remaining before our profession and our leaders are as follows:

TABLE 1

Employment Summary for Environmental Health-Related Fields From 2012 Projected to 2022

Occupation Classification Title	2012 Employment ^a	2022 Employment ^a	New Positions ^a (2012–2022)	% Growth	Job Openings ^a (2012–2022)	2012 Median Annual Wage	Rank of 166 Job Titles
Environmental scientists and specialists, including health	90	103.2	13.2	14.6	39.7	63,570	33
Environmental engineers	53.2	61.4	8.1	15.3	21.1	80,890	35
Geoscientists	38.2	44.2	6	15.8	17.3	90,890	37
Chemists	87.9	92.9	5	5.6	27.8	71,770	70
Occupational health and safety specialists	62.9	67.1	4.2	6.6	21.3	66,790	71
Food scientists and technologists	19.4	21.5	2.1	10.8	8.5	58,070	87
Microbiologists	20.1	21.6	1.4	7	7.1	66,260	99
Soil and plant scientists	16.3	17.6	1.2	7.5	6.7	58,740	111
Life scientists	9.9	10.9	1	10.2	3.1	65,330	115
Biological technicians	80.2	88.3	8	10	32.1	39,750	116
Zoologists and wildlife biologists	20.1	21.1	1	4.9	6.7	57,710	128
Foresters	12	12.8	0.7	6.1	4.2	55,950	131
Biological scientists	34.3	34.1	-0.2	-0.6	9.8	72,700	132
Forensic science technicians	12.9	13.7	0.7	5.8	5.8	52,840	136
Emergency management directors	9.9	10.7	0.8	8.3	2.2	59,770	137
Conservation scientists	22.1	22.3	0.1	0.5	6.6	61,100	142
Recreation workers	345.4	394.4	49	14.2	89.7	22,240	145

Note: Ranked using a rank-based formula considering median annual wage, percentage growth, and new openings. Source: Bureau of Labor Statistics, 2015a.

^aIn thousands.

How great is the need for interdisciplinary EH professionals and are we meeting that need? Furthermore, what can we do to strengthen our profession to ensure our profession remains competent in the applied science areas of the profession while protecting our core public health backbone that unites us? To address these questions, we look at the most current data on employment in our profession and related occupations as well as the ongoing work of the Association of Environmental Health Academic Programs (AEHAP).

Employment Outlook

The U.S. Department of Labor Bureau of Labor Statistics (BLS) (2015a) provides employment and projected employment statistics for 818 occupations according to their respective standard occupation classification (SOC) system code. Among these 818 occupations, 166 are designated as having a typical entry-level education of a bachelor's degree. "Environmental scientists and specialists, including

health," are included in this group of 166 as SOC 19-2041. Also in this group of 166 is the "occupational health and safety specialists" occupation, which is a different classification (SOC 29-9011). Several of the job titles BLS associates with the environmental science code include environmental analyst, environmental scientist, hazardous substances scientist, health environmentalist, water pollution scientist, and water quality analyst. In the occupational health code, titles such as industrial hygienist, health and safety inspector, and environmental health sanitarian are listed. Based upon the diversity of the professions represented as environmental health scientists, it is difficult to specifically identify a single job code representative of the profession as a whole (Massoudi, Blake, & Marcum, 2012; Sumaya, 2012). Additionally, the data are representative of the nation, and may not reflect all local or regional workforce conditions.

In reviewing the BLS employment outlook data, three key measures of great in-

terest to prospective environmental health professionals, including students, stand out: annual wages, number of job openings, and employment growth. The annual wage data are based upon the median earnings in the profession in 2012. The job openings data represent the number of job openings due to growth and replacement from 2012 through 2022. In this data, replacement includes the number of persons leaving the profession including retirement whose positions will need to be replaced. The third data piece, growth of the profession, represents the percentage growth in total number of persons projected to be working in the field in 2022 compared to 2012. Using these data, we ranked 166 programs from 1 to 166 in each area. We then multiplied the rankings of each of these three areas to provide an overall rank that accounts for earnings, job growth, and job availability to enable a comparison of the various related professions and to compare the environmental health

TABLE 2

Employment Summary for Environmental Scientists and Specialists, Including Health, in the Nongovernmental Professional, Scientific, and Technical Services Fields From 2012 Projected to 2022

Area and Area of Industry	2012		2022		% Growth	Employment Change ^a
	Employment ^a	% of Occupation	Employment ^a	% of Occupation		
Professional, scientific, and technical services	36.3	40.3	47.5	46.0	30.9	11.2
Architectural, engineering, and related services	12.9	14.4	15.7	15.2	21.3	2.8
Engineering services	9.0	9.9	10.9	10.5	21.1	1.9
Testing laboratories	3.8	4.2	4.6	4.4	21.5	0.8
Management, scientific, and technical consulting services	19.2	21.3	27.0	26.1	40.8	7.8
Scientific research and development services	3.6	4.0	4.1	4.0	12.5	0.5
Research and development in the physical, engineering, and life sciences	3.4	3.8	3.8	3.7	12.4	0.4

Source: Bureau of Labor Statistics, 2015a.
^aIn thousands.

profession to the nation’s fastest growing, well-paying occupations.

In terms of median earning potential for environmental scientists and specialists, including health, we see the 2012 median wages were \$63,570 (Table 1). A slightly higher median wage was observed for the occupational health classification at \$66,970 (Table 1). In terms of the 166 occupational classifications, both occupational codes rank in the top half of all baccalaureate degree requiring jobs with rankings of 71 and 78, respectively, of the 166 programs. Compared to the environmental-related occupations listed on Table 1, the wages for these two occupational codes are in the top quartile.

Although pay is important, the ability to secure employment is also of importance. With respect to job openings, when combining the two occupational codes, 61,000 new professionals will be needed to replace retirees and fill the new positions produced by growth demands. The environmental scientist and specialist, including health, classification is among the top one-third of baccalaureate degree-based occupations in the country for number of projected job openings, and occupational health and safety specialists are in the top half. Both occupational classifications

present very large numbers of openings compared to many of the other environmental-related occupations, with environmental scientists and specialists, including health, being the leader in this group (Table 1).

In terms of growth, the environmental scientist and specialist, including health, classification is growing in terms of new positions with a 15% growth rate. This rate is greater than the national average of 10.5%. The occupational health and safety classification is growing slower than the national average, with decreases in federal employment and manufacturing projected. Among all 166 occupations assessed, environmental scientists and specialists, including health, as an occupation is growing faster than 123 other occupations requiring a baccalaureate degree for job entry.

A detailed look at the location of much of this growth shows significant new jobs and demand for environmental health personnel in areas related to professional, scientific, and technical services and health care (BLS, 2015a). The majority of the growth in the professional, scientific, and technical services area is likely to occur in management, scientific, and technical consulting services, where 41% growth is projected to occur (Table 2; BLS,

2015b). Similar large gains in the same consulting services area of the industry are also projected in the occupational health and safety occupation, again with 41% growth projected (BLS, 2015b). In total, in the environmental scientists and specialists, including health occupation, an additional 7,800 new consultants are expected between 2012 and 2022. Additionally, 1,700 new consultants are expected in the occupational health and safety occupation.

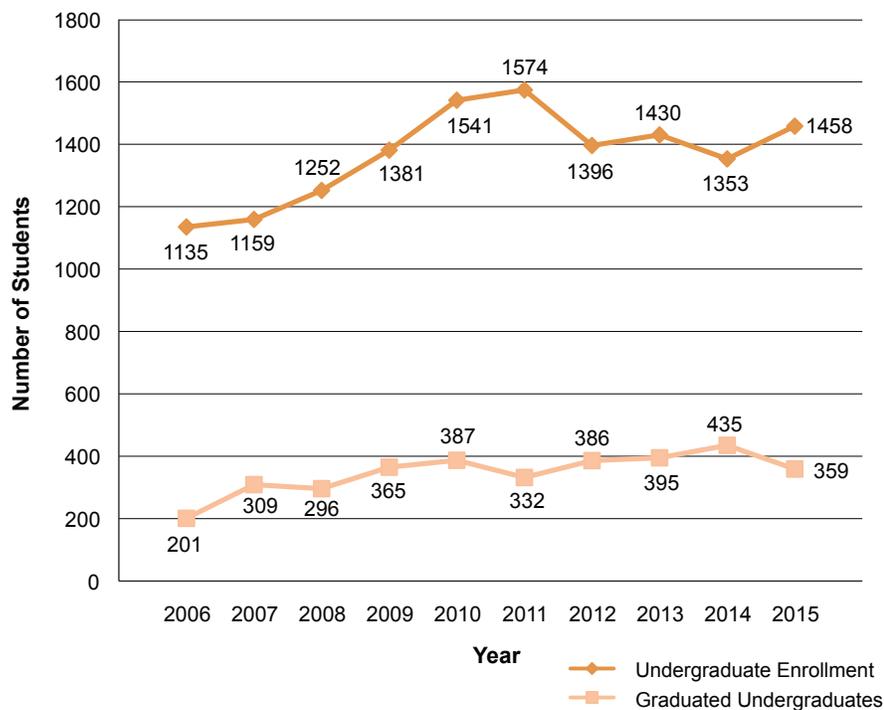
With respect to the public workforce, the environmental scientists and specialists, including health, occupation currently represents 38,500 persons and is expected to grow by 1,000 state and local government positions, while decreasing by 700 federal positions (BLS, 2015b). In the occupational health classification, a total of 20,100 persons are employed, and a loss of 1,000 federal positions is projected by 2022, with a gain of 400 local and state positions (BLS, 2015b). When combined, the two occupational classifications represent 58,600 current public sector employees in these occupations.

Meeting Educational Needs

Despite much progress in recruiting and graduating more students, the private sector of environmental health continues to

FIGURE 1

Undergraduate Enrollment Trends and Graduation Rates Over 10-Year Period



grow quickly, contributing to a shortfall of qualified environmental health professionals. AEHAP formed in 1999 in response to a national shortage of highly trained environmental health professionals, and due to growth in the field, this response is still warranted. AEHAP's primary focus is to support, enhance, and diversify the student body of environmental health degree programs accredited by the National Environmental Health Science and Protection Accreditation Council (EHAC). For ensuring a healthy environmental health workforce, AEHAP is charged with three primary objectives: (1) to increase the number of EHAC-accredited programs, (2) to increase the number of students enrolled in these programs, and (3) to increase the diversity of the student body in EHAC-accredited programs.

New program recruitment is AEHAP's primary activity. AEHAP has greatly increased marketing to potential environmental health science academic programs via e-mail, social media, face-to-face outreach through exhibiting at conferences, and direct mail.

Increased outreach has led to a total of 23 programs currently interested in joining the ranks of EHAC's 39 accredited programs. Programs seeking accreditation are supported with mentoring from volunteer faculty in EHAC programs. By growing the number of programs, the opportunity to attract more students to the profession increases.

Among the EHAC-accredited programs, the 2014–15 undergraduate enrollment increased from 1,353 to 1,458, representing an 8% increase from the 2013–14 academic year (Figure 1). Furthermore, an 11% increase in graduate enrollment was observed from 260 last year to 289 current graduate students. The total enrollment for this year was 1,757 students, which is an increase of 4% as compared to 1,683 students enrolled in the 2013–2014 academic year. The 2014–2015 undergraduate enrollment rate is currently 7% above the 10-year enrollment average. Graduate enrollment is at an all-time high. This year also resulted in the graduation of a total of 436 students—359 undergraduates and 77 graduates.

Student diversity has seen a steady rise for the past 10 years. Currently, 38% of students enrolled in EHAC-accredited programs are minorities. Diversity trends have largely increased or decreased according to the number of Minority Serving Institutions that are accredited by EHAC. Overall, diversity has increased by 91% since the academic year 2005–2006.

Promoting the Profession

The environmental health profession is an in-demand profession, particularly in the private sector. This trend is likely to continue, with greater than 40% growth anticipated in consulting by 2022. Higher paying cooperative education opportunities with large companies and consulting firms are aimed at training and enticing environmental health students into jobs, leading environmental health students into respectable careers. Low pay or no pay for internships with public health agencies, particularly state and local agencies, creates a selection pressure that may discourage some of the best students from seeking the public opportunities. Some progress has been made in recent years with paid internships provided by the Centers for Disease Control and Prevention and other agencies; however, the profession has further to go and should not be shy in using data to make a case about the environmental health profession's unique position in the public health landscape. Furthermore, the profession ought to also continue to tout the value that is also brought by private sector environmental health practitioners in promoting and protecting the nation's health (Roberts, 2009).

Practitioners and local leaders in the environmental health field can play a critical role in promoting the profession and should be comfortable championing the opportunities available to college-seeking students and adults, as well as current college students who may have an interest in pursuing a degree in environmental health. Many entering college students are often unaware of the employment outlook and salary profile of their chosen majors, and when given factual data in low wage fields, these students prefer to seek out more lucrative options (Arcidicono, Hotz, & Kang, 2012). For university partners, many of the courses required for an environmental health major are often offered, and by working with AEHAP, a university can pursue the opportunity to establish an

accredited program in this growth area. For students desiring a favorable occupational outlook in an environment outside information technology and full-time office settings in the finance industry, few careers offer the diversity of daily duties and balance as the environmental health profession (Table 3).

Lastly, promoting the public environmental health profession does not stop with promoting education or training, but also promoting competitive pay in the public workforce. As private sector opportunities increase, the need for greater resources for maintaining a high-quality public sector workforce is worthy of consideration or further research. When students graduate, multiple occupations are considered, with public- and private-sector jobs and careers both being viable options, more so in environmental health than in any of the other public health professions. Therefore, true understanding of our profession requires not only understanding of the public sector environmental health employment outlook, but also the important and ever-growing role of private-sector environmental health. 🐼

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TABLE 3

Employment Summary for Top 33 Job Titles According to a Rank Order Considering Median Annual Wage, Percentage Growth, and Number of New Job Openings in Thousands

Occupational Classification Title	% Growth	Job Openings ^a (2012–2022)	2012 Median Annual Wage	Rank of 166 Titles
Software developers, applications	22.8	218.5	90,060	1
Software developers, systems	20.4	134.7	99,000	2
Medical and health services managers	23.2	149.9	88,580	3
Computer and information systems managers	15.3	97.1	120,950	4
Computer systems analysts	24.5	209.6	79,680	5
General and operations managers	12.4	613.1	95,440	6
Management analysts	18.6	245.2	78,600	7
Construction managers	16.1	154.6	82,790	8
Civil engineers	19.7	120.1	79,340	9
Information security analysts	36.5	39.2	86,170	10
Marketing managers	12.7	61.7	119,480	11
Financial analysts	15.5	100.9	76,950	12
Personal financial advisors	27	96.4	67,520	13
Human resources managers	13.2	40.6	99,720	14
Computer network architects	14.6	43.5	91,000	15
Market research analysts	31.6	188.5	60,300	16
Financial managers	8.9	146.9	109,740	17
Logisticians	21.9	42.2	72,780	18
Petroleum engineers	25.5	19.6	130,280	19
Administrative services managers	12.2	79.9	81,080	20
Architects	17.3	44.1	73,090	21
Sales managers	8.3	106.9	105,260	22
Operations research analysts	26.7	36	72,100	23
Database administrators	15.1	40.3	77,080	24
Cost estimators	26.2	118	58,860	25
Accountants and auditors	13.1	544.2	63,550	26
Securities, commodities, and financial services agents	11.2	122.6	71,720	27
Network and computer systems administrators	11.7	100.5	72,560	28
Sales representatives	9.7	111.8	74,970	29
Social and community service managers	20.8	55.1	59,970	30
Public relations and fundraising managers	12.9	21.3	95,450	31
Actuaries	26.1	13.2	93,680	32
Environmental scientists and specialists, including health	14.6	39.7	63,570	33
^a In thousands.				

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ACCREDITED ENVIRONMENTAL HEALTH SCIENCE AND PROTECTION PROGRAMS

The following colleges and universities offer accredited environmental health programs for undergraduate and graduate degrees (where indicated). For more information, please contact the schools directly, visit the National Environmental Health Science and Protection Accreditation Council (EHAC) Web site at www.ehacoffice.org, or contact EHAC at ehacinfo@aehap.org.

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