



**NATIONAL
ENVIRONMENTAL HEALTH
SCIENCE AND PROTECTION
ACCREDITATION COUNCIL
(EHAC)**

Outcome Assessment Report

Compiled by Leslie Mitchell

This report details the analysis of the data provided by Graduates and their Supervisors of the three programs seeking re-accreditation during the 2016-2017 academic year.

Background:

The EHAC Undergraduate Guidelines Section VI. Reporting Obligations of Accredited and Pre-accredited Programs Part D. Program Outcomes Assessment Survey states that:

“At the time of re-accreditation, the institution shall survey program graduates and employers via the Council’s outcome assessment tool. All graduates since the last accreditation shall be in the pool of those to be surveyed. The completed tools shall be gathered by the institution and forwarded to the Executive Director of the Council six months prior to the annual meeting of the Council. The Council will supply a summary of the information gathered to all accredited programs on an annual basis.

The purpose of this survey is to determine the adequacy of the accreditation process to the needs of the professional practice of environmental health. The information gathered by an institution through the outcome assessment process will not be used as part of the evaluation review for re-accreditation purposes for a given institution. The Council will use the compiled information from all institutions undergoing re-accreditation to evaluate and consider changes to the requirements of accreditation.”

The outcome assessment tool consists of two surveys conducted through surveymonkey.com, one for graduates and the other for their supervisors. It is distributed to the re-accreditation candidate Program Directors for distribution to their graduates. The graduates then provide the supervisor survey link to their supervisors.

Table 1. 2016 Outcome Assessment Respondents

Re-accreditation Applicants	Program	Next Accred. Review	Initial Accred. Year	Graduating Classes reflected	Number of Graduate Respondents	Number of Supervisor Respondents
University of Washington	Undergraduate	2017	1976	2012-14, 2016	7	5
University of Wisconsin Eau-Claire	Undergraduate	2017	1975	2008, 2011-14, 2016	13	5
Western Carolina University	Undergraduate	2017	1984	2010-2016	23	10

Undergraduate Skills

Listed below are core competencies in environmental health programs. Respondents were asked to choose the option that most closely described their skill level. The percentages reflect 43 graduate survey respondents.

Figure 1.

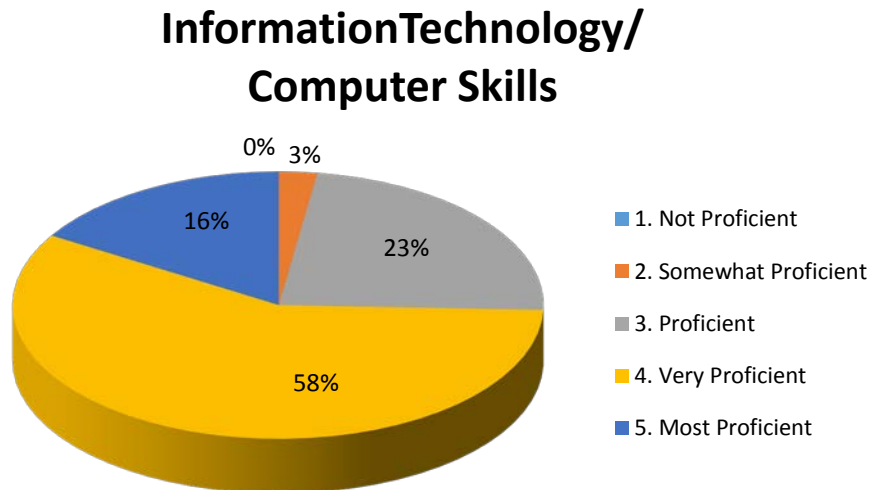


Figure 2.

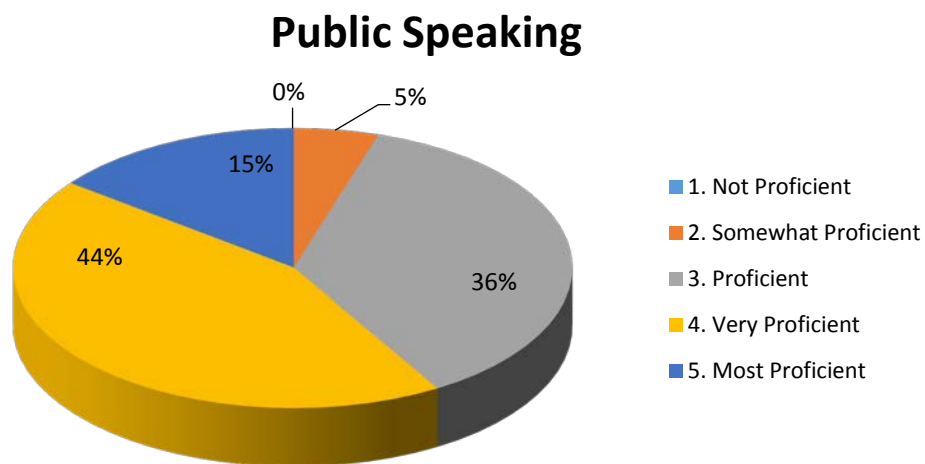


Figure 3.

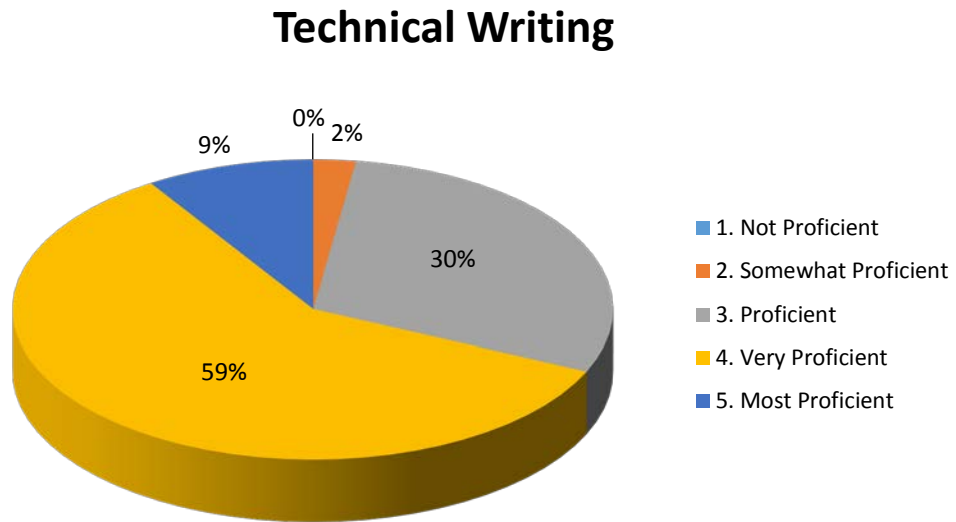


Figure 4.

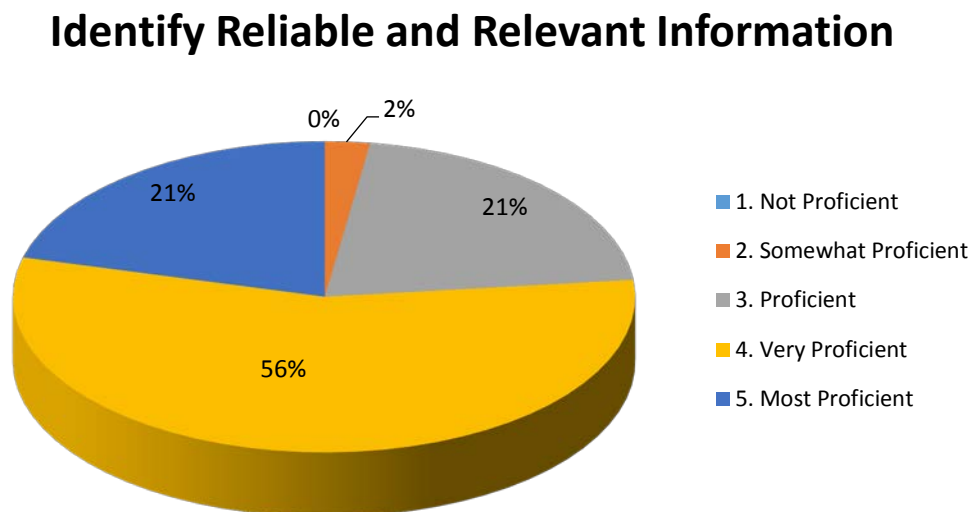


Figure 5.

Drawing Appropriate Conclusions

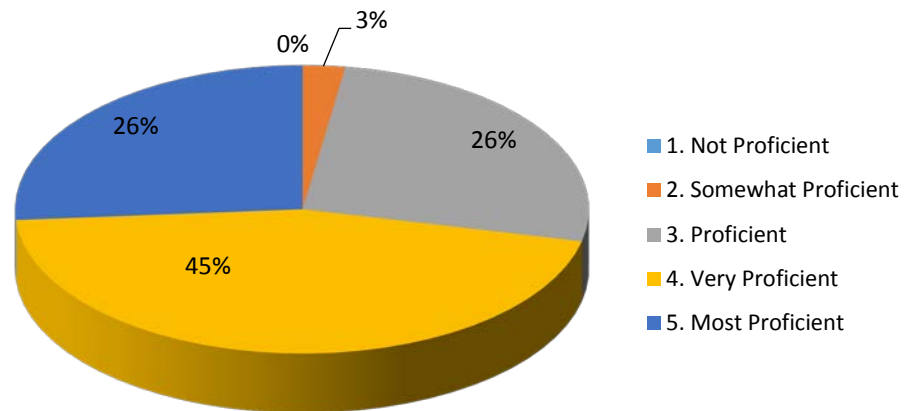


Figure 6.

Choosing and Defending an Appropriate Course of Action

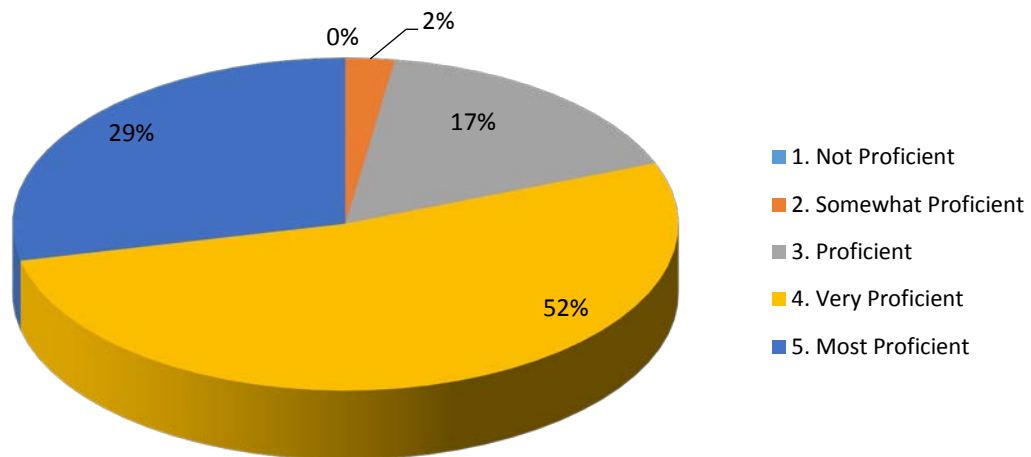


Figure 7.

Conducting a Statistical Analysis and Interpreting Data

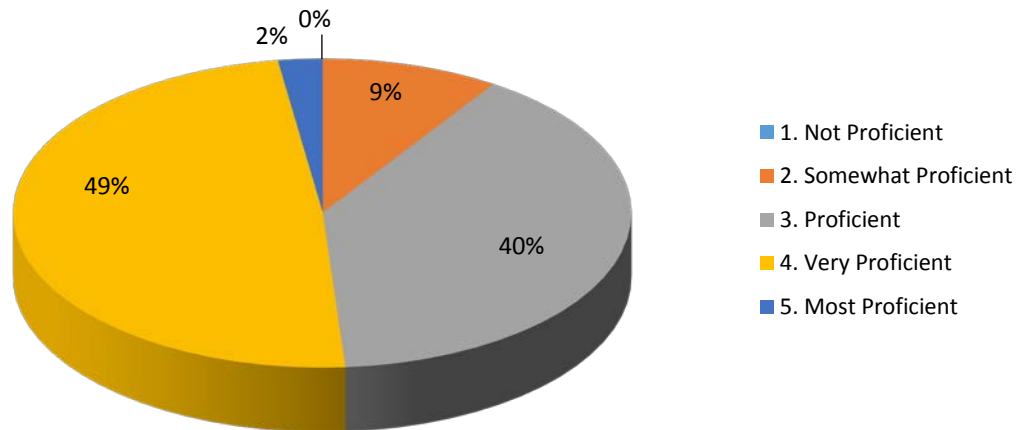


Figure 8.

Applying Research Methods and Problem Solving

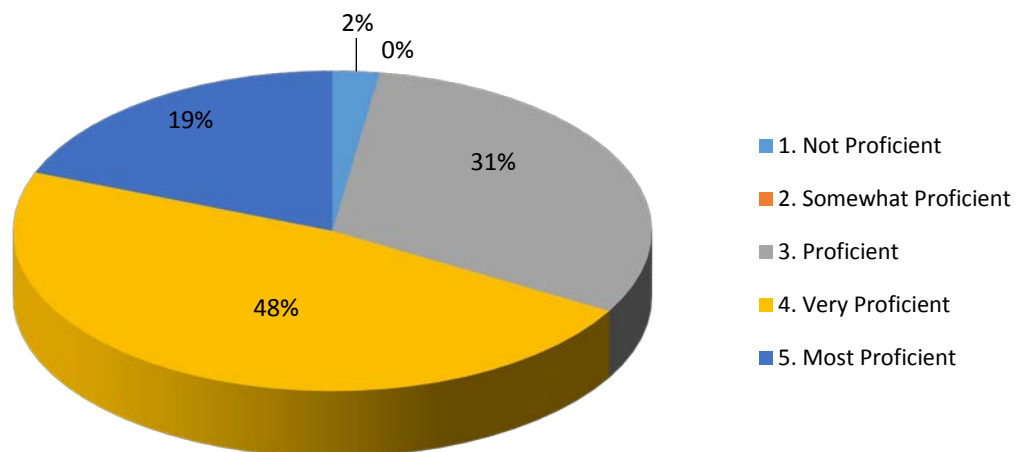


Figure 9.

Working in a Team Setting

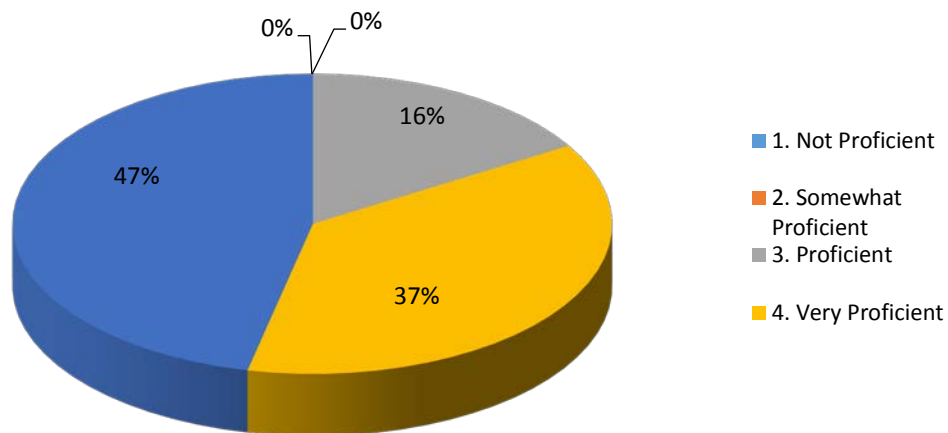


Figure 10.

Leadership Skills

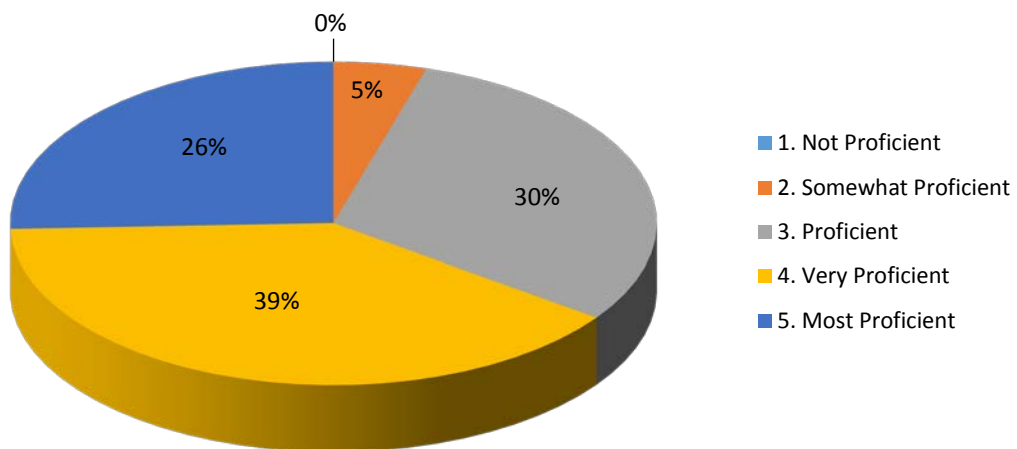


Figure 11.

Organizing Work Flow

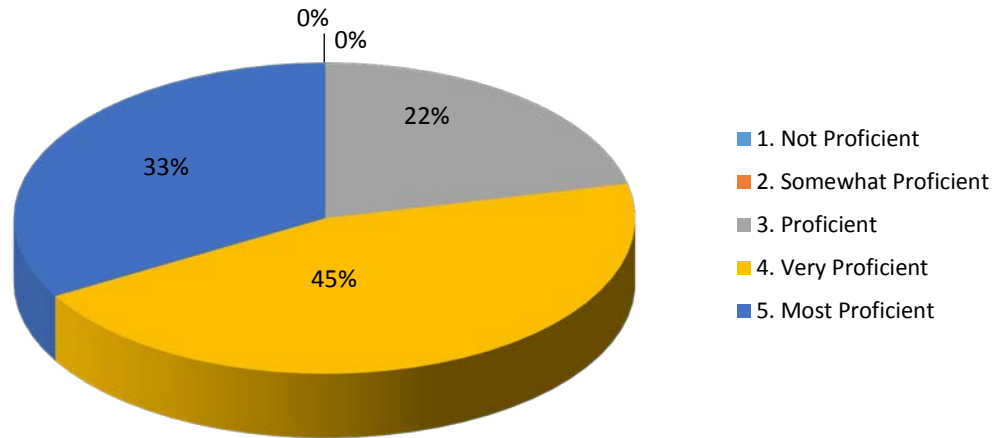


Figure 12.

Time Management

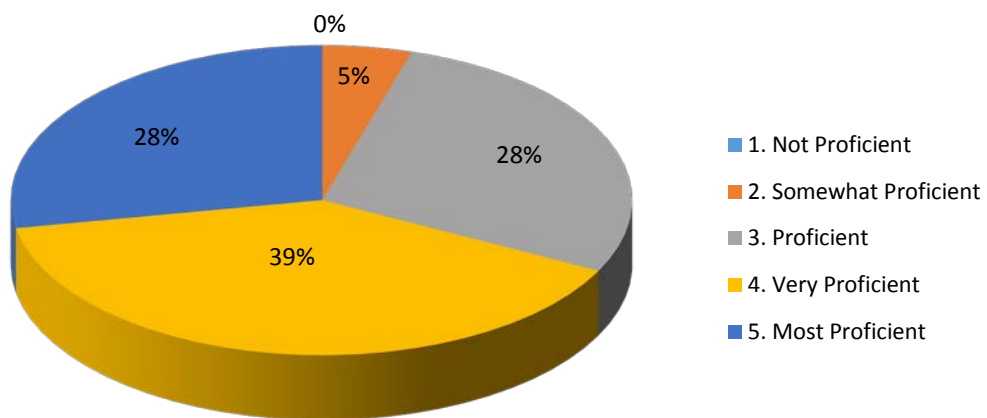


Figure 13.

Project Planning and Management

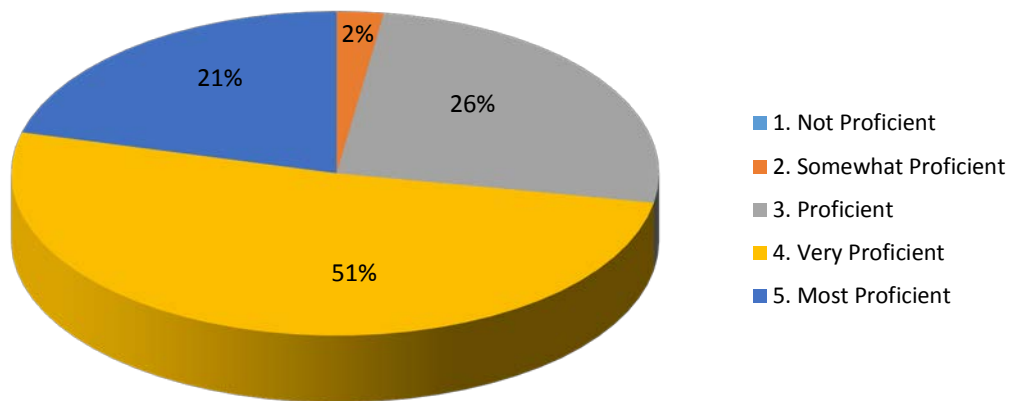


Figure 14.

EPIDEMIOLOGY

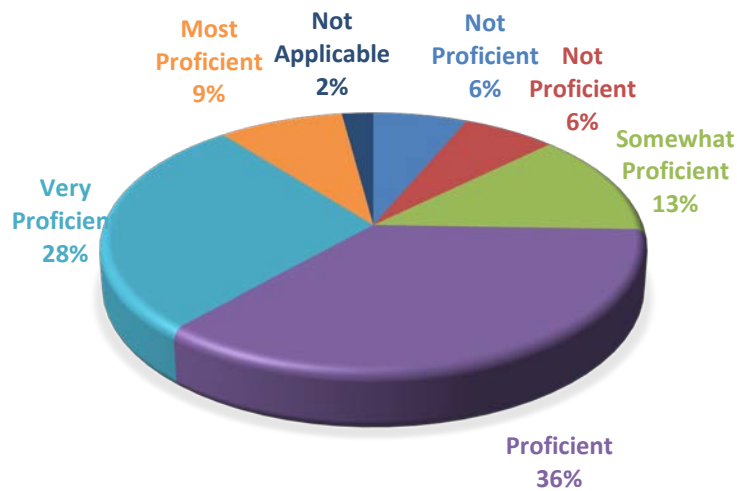


Figure 15.

TOXICOLOGY

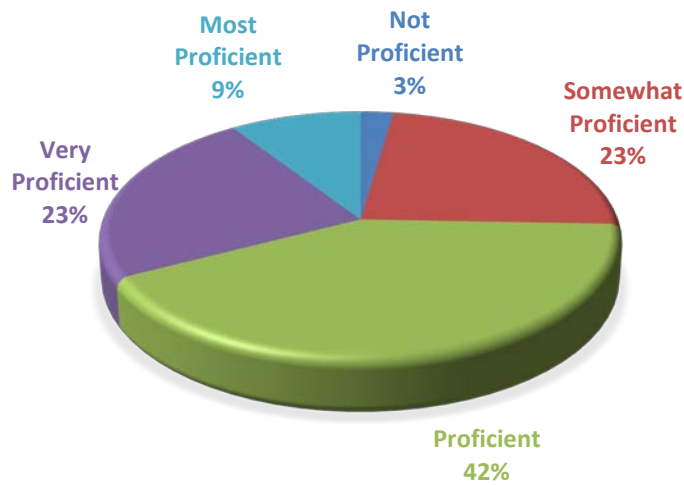


Figure 16.

RISK ASSESSMENT

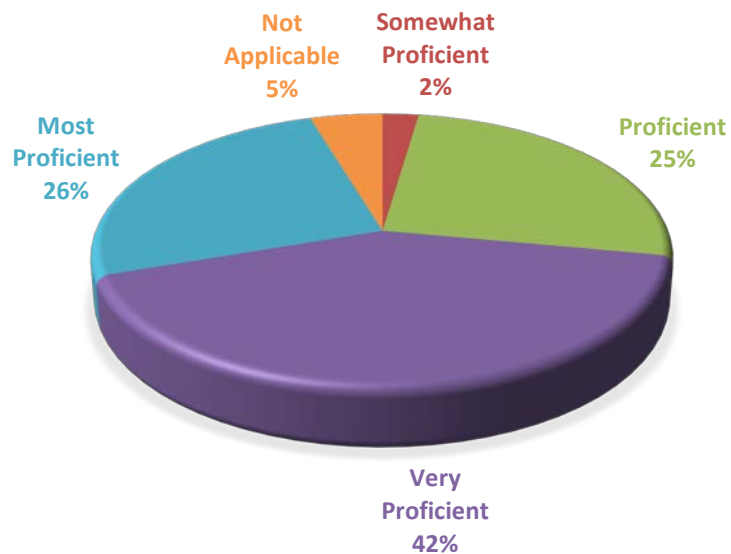


Figure 17.

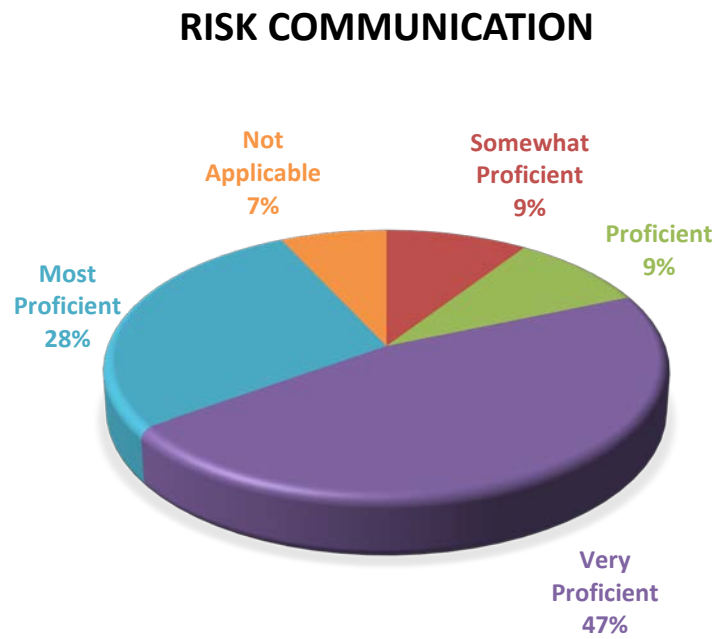


Figure 18.



Skill Levels of Recent Graduates

Respondents were asked to rate their skill-level (**5 Most Proficient, 1 Least Proficient**) in the following areas:

Table 2. Graduate Skills - All Respondents

Skills	Number of Respondents	Average
Information Technology/Computer Skills	43	3.90
Public Speaking	43	3.60
Technical Writing	43	3.60
Identify Reliable and Relevant Information	43	4.00
Drawing Appropriate Conclusions	43	4.00
Choosing and Defending an Appropriate Course of Action	43	4.10
Conducting a Statistical Analysis and Interpreting Data	43	3.50
Applying Research Methods and Problem Solving	43	3.80
Working in a Team Setting	43	4.20
Leadership Skills	43	3.90
Organizing Work Flow	43	4.10
Time Management	43	3.8
Project Planning and Management	43	3.9
Epidemiology	43	3.60
Toxicology	43	3.70
Risk Assessment	43	3.10
Risk Communication	43	2.80
Risk Management	43	3.00

Table 3. Graduate Skills - University of Washington – redacted from public report

Table 4. Graduate Skills – Western Carolina University - redacted from public report

Table 5. Graduate Skills – University of Wisconsin, Eau Claire - redacted from public report

Course Relevance - All Respondents

Graduate respondents were asked to answer yes or no if their job required knowledge in the following areas found in environmental health.

Table 6. Program Areas

Job requires knowledge of:	Individual No	Individual Yes	N/A	Total	%No	%Yes
Air Quality Control	21	20	2	43	0.49	0.47
All-hazard Preparedness	13	28	2	43	0.3	0.65
Built Environment	25	15	3	43	0.58	0.35
Disease Prevention (e.g. vectorborne, zoonotic, etc.)	19	22	2	43	0.44	0.51
Environmental Health Planning	16	25	2	43	37.1	0.58
Food Protection	21	19	3	43	0.49	0.44
Geographical Information Systems (GIS)	28	12	3	43	0.65	0.28
Global environmental Health	30	10	3	43	0.7	0.23
Hydrogeology	30	10	3	43	0.7	0.23
Injury Prevention	17	24	2	43	0.4	0.56
Institutional Health	26	15	2	43	0.61	0.35
Occupational Health and Safety	17	24	2	43	0.4	0.56
Radiation Health	31	10	2	43	0.72	0.23
Recreational Environmental Health	26	14	3	43	0.61	0.32
Risk Analysis	13	28	2	43	0.3	0.65
Soils	27	13	3	43	0.63	0.3
Job requires knowledge of:	Individual No	Individual Yes	N/A	Total	%No	%Yes
Solid and Hazardous Material and Waste Management	17	23	3	43	0.4	0.53
Vector Control	26	14	3	43	0.61	0.33
Water and Waste Water	13	26	4	43	0.3	0.61

Specialty Area Knowledge & Program Preparation-All Respondents

Graduate respondents were asked to answer yes or no if they were well-prepared in the following specialty areas in their undergraduate program.

Table 7. Graduate Preparation to Perform EH Activities

Degree to which EH Program prepared me in:	Not Prepared	Somewhat Prepared	Well Prepared	N/A	Total	% Somewhat Prepared	% Well Prepared
Air Quality Control	2	11	15	15	43	0.26	0.35
All-hazard Preparedness	1	10	22	10	43	0.23	0.51
Built Environment	1	10	22	10	43	0.23	0.51

Disease Prevention (e.g. vectorborne, zoonotic, etc.)	1	3	20	19	43	0.07	0.47
Environmental Health Planning	1	6	20	16	43	0.14	0.47
Food Protection	2	1	22	18	43	0.02	0.51
Geographical Information Systems (GIS)	9	7	5	22	43	0.16	0.12
Global environmental Health	2	4	11	26	43	0.09	0.26
Hydrogeology	5	8	5	25	43	0.19	0.12
Injury Prevention	2	9	16	16	43	0.21	0.37
Institutional Health	3	6	11	23	43	0.14	0.26
Occupational Health and Safety	1	8	19	15	43	0.19	0.44
Radiation Health	1	8	19	15	43	0.19	0.44
Recreational Environmental Health	2	5	13	23	43	0.12	0.3
Risk Analysis	0	7	23	13	43	0.16	0.54
Soils	4	9	8	22	43	0.21	0.19
Solid and Hazardous Material and Waste Management	3	12	13	15	43	0.28	0.3
Vector Control	2	3	16	22	43	0.07	0.37
Water and Waste Water	1	4	25	13	43	0.09	0.59

Graduate Work Place Data:

The pie chart below represents job sectors for graduates of the three schools surveyed. Of the 43 respondents, 36 are currently working, seven are not working.

Figure 19.

JOB SECTOR DISTRIBUTION OF WORKING GRADUATES

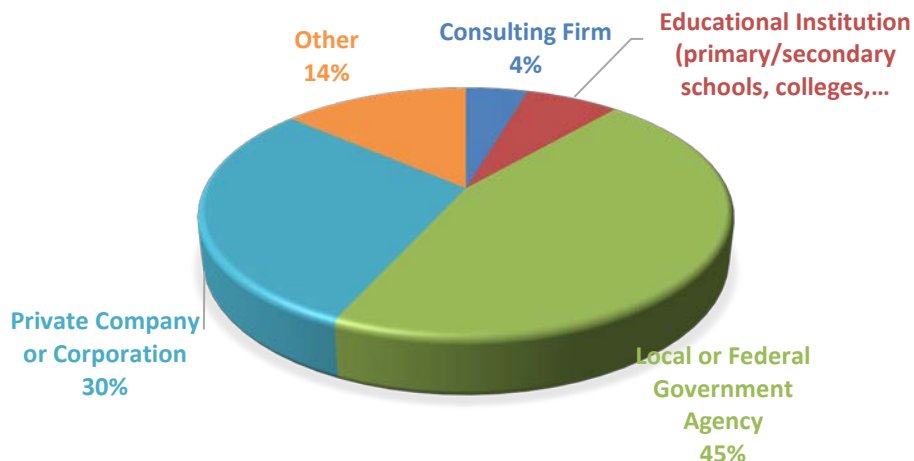


Figure 20.

GRADUATES WORKING IN LOCAL OR FEDERAL GOVERNMENT

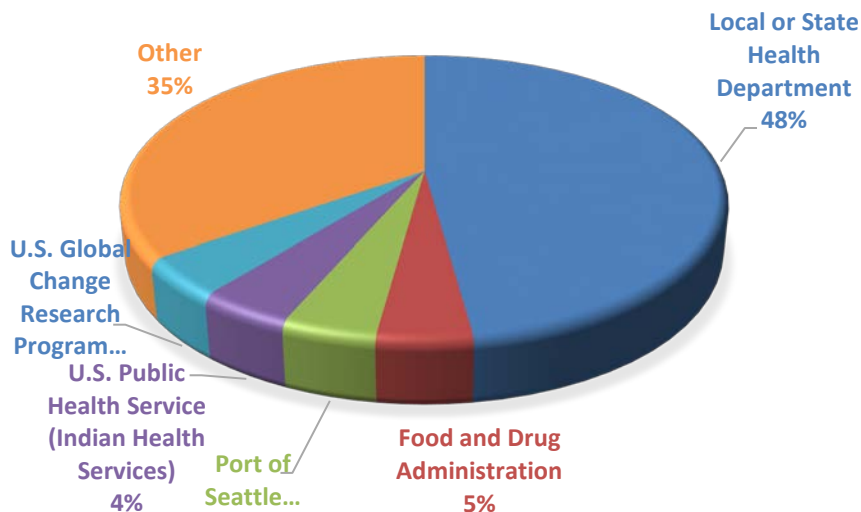
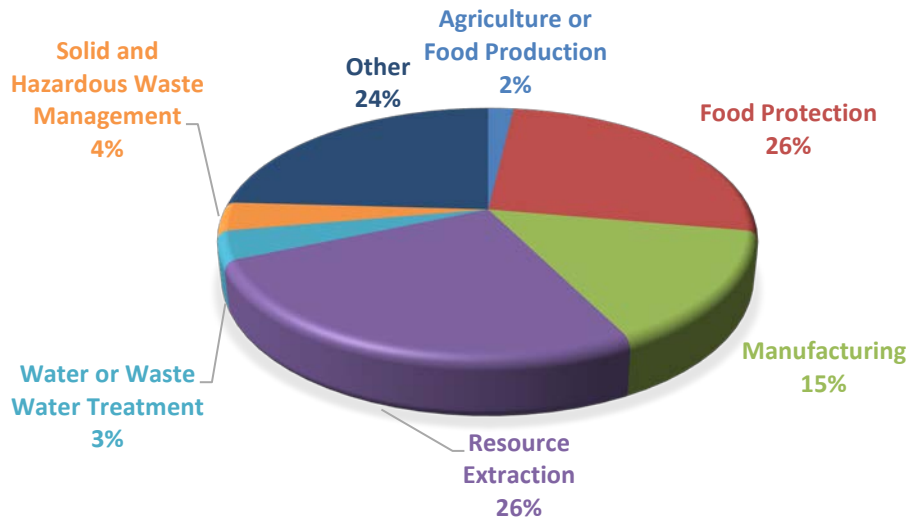


Figure 21.

GRADUATE'S PRIMARY AREA OF WORK



Note: "Other" includes: Occupational Safety and Health/Industrial Hygiene, Chemical Manufacturing, Climate Science, Academia, Drinking Water, Electronic Health Records, Environmental Health Monitoring, Food, Sewage and Water programs, Laboratory Safety, Transportation.

Figure 22.

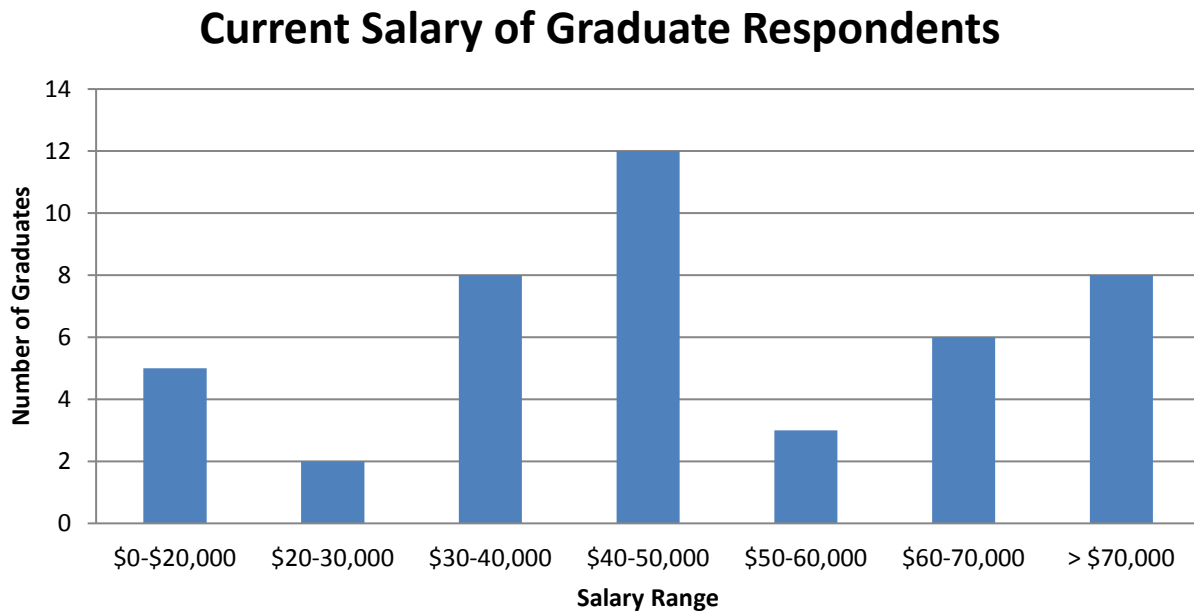
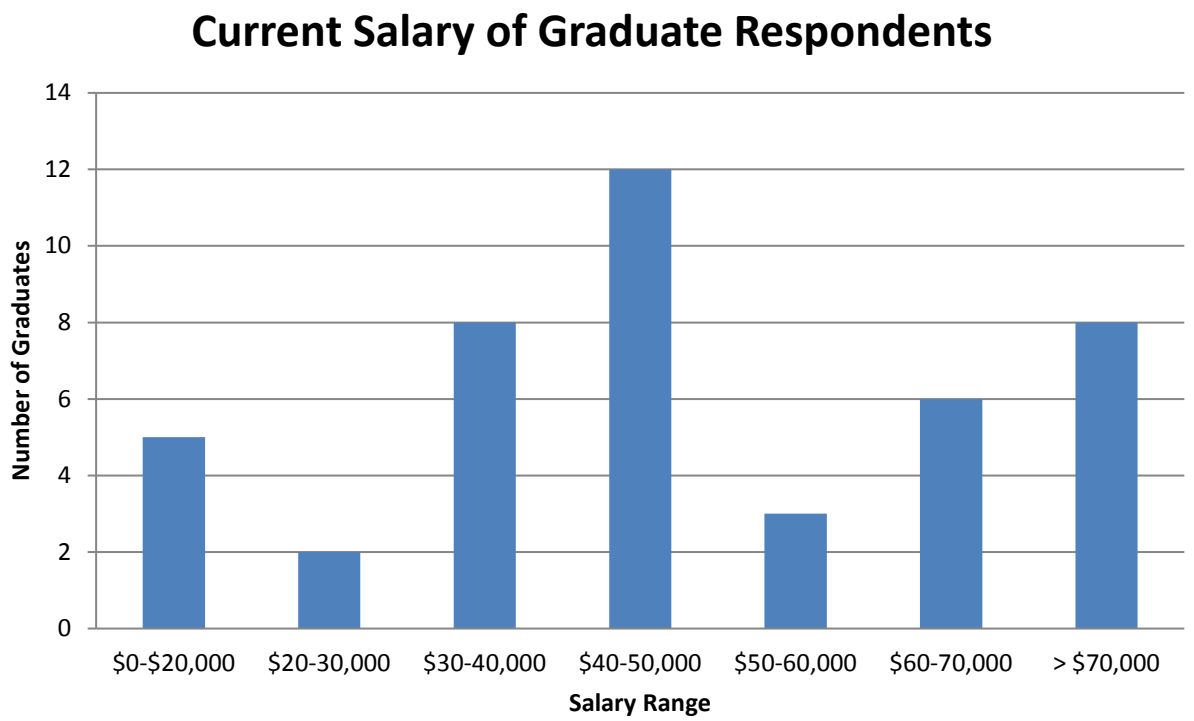


Figure 23.



Initial Employment

The following were listed as specific places of employment for 43 Graduate respondents

Table 8. Specific Places of Employment

Federal Contractor
Manufacturing Corporation (Industrial Hygiene Related Position)
Student
N/A or none

Graduate Data on Continuing Education and Professional Development

The Figure below details the types of degrees completed by graduates after earning a degree in Environmental Health:

Table 9. Post Undergraduate Education

Number of Graduates that have Completed Post-Baccalaureate Degrees	Types of Degrees Awarded
10	MPH, MPH Global Communicable Disease, MPH Environmental Health and Occupational Health (Industrial Hygiene), MS Exposure Science, MS Industrial Hygiene, MS in Public Health (Industrial Hygiene)

Professional Recognition

The following were listed as specific professional awards received by 12 respondents:

Figure 10. Awards Received

2015 MEHA-Emerging Professional and 2015 MEHA-Merit Award
<i>AIHA AIHce 2016 Sponsorship, Georgia-Pacific ASSE Safety 2016 Sponsorship, 3M PSD Safety Scholarship, AIHF General Scholarship, UA Workforce-Ready Fellowship</i>
Certified Safety Professional (CSP), Advanced Safety Certificate (ASC), Manager of Environmental Health & Safety Programs (MESH)
Commendation Medal (USPHS), Presidential Unit Citation (USPHS), three Special Act/Special Service Team Awards (DHHS/IHS), Environmental Health Officer of the Year (Tucson Area IHS), Field Medical Readiness Badge (USPHS),
Delta Omega Honorary Society Inductee, UAB Chapter, UAB SOPH Outstanding Masters Student of the Year Award 2014 (received once I was already working)
Two promotions - was initially hired as a temporary employee, promoted to technician and then promoted to coordinator.
IHS Phoenix Area Team Award
Recognized in a Port Wide Intern Spotlight, Received a Certification of completion for the internship.

Credentials Achieved: The following were listed as specific certificate or credentialing exams passed by 21 respondents:

Table 11.

"Encadrant technique amiante SS4" French certificate to safely manage work with asbestos exposure.
40 Hour HAZWOPER Certificate, OSHA 30 Hour General Industry Certificate, 16 Hour HACCP Food Safety Certificate, First Aid/CPR/AED Certificate
Associate Safety Professional (ASP) and Certified Safety Professional (CSP)
Certified in Public Health Certified Pool Operator Florida department of health, environmental health professional in food protection
CP-FS, CPO, CFPM
CPO
OSHA 10-hour for Construction Safety
OSHA 30 hours
Registered Environmental Health Specialist Completed FDA Standardization in Inspection
Registered Environmental Health Specialist (REHS) in Minnesota
Registered Environmental Health Specialist NC
Registered Sanitarian
REHS - 9 graduate respondents
Food and Lodging authorization, Pool authorization
NC Authorizations: Food, Lodging, and Institutions, Wells, Daycares and school buildings, Pools and Tattoos
Illinois Pesticide Applicators Training
CPH, CPST,
REHS/RS 40-hr HAZWOPER
RS, CPO, CFM

Professional Organizations

Thirty graduate respondents indicated involvement in the professional organizations listed below:

Table 12.

NAEM
AIHA (member and Treasurer-elect of AZ AIHA),ASSE (member and Vice-President of Southern AZ ASSE) NEHA (member)
AIHA - 2 Graduate Respondents
American Industrial Hygiene Association (AIHA), International Affairs Committee (IAC) Ambassador to Switzerland
American Society of Safety Engineers (ASSE), American Industrial Hygiene Association (AIHA)-Carolinas Section
APHA
APHA - member, Washington Metro Area Construction Safety Association - member

Arizona Foodborne Illness Taskforce (member), Head Start Advisory Committee (local Tribe), and NEHA (member)
ASSE - 5 Graduate Respondents
Figure 12 contd.
ASSE Student Chapter Secretary
AWWA, ERWOW, WETRC - member only through employer
Iowa environmental health association - professional development committee NEHA - member
MEHA- Leadership role (Committee Chair, Board Member) HC ERG Women in STEM- Chair
Minnesota Environmental Health Association (member only)
NEHA - 7 graduate respondents
WSEHA member
WALHDAB: member
WEHA - 4 Graduate Respondents
WPNCPPA
WSEHA, member

Supervisor Survey Results

Supervisors of Graduates from re-accrediting programs were asked to assess the skill and preparedness of their employees. Eighteen Supervisors responded to the survey and their responses are presented below along with information related to their job sector and primary areas of work.

Figure 24

Job Sector Distribution of Supervisors

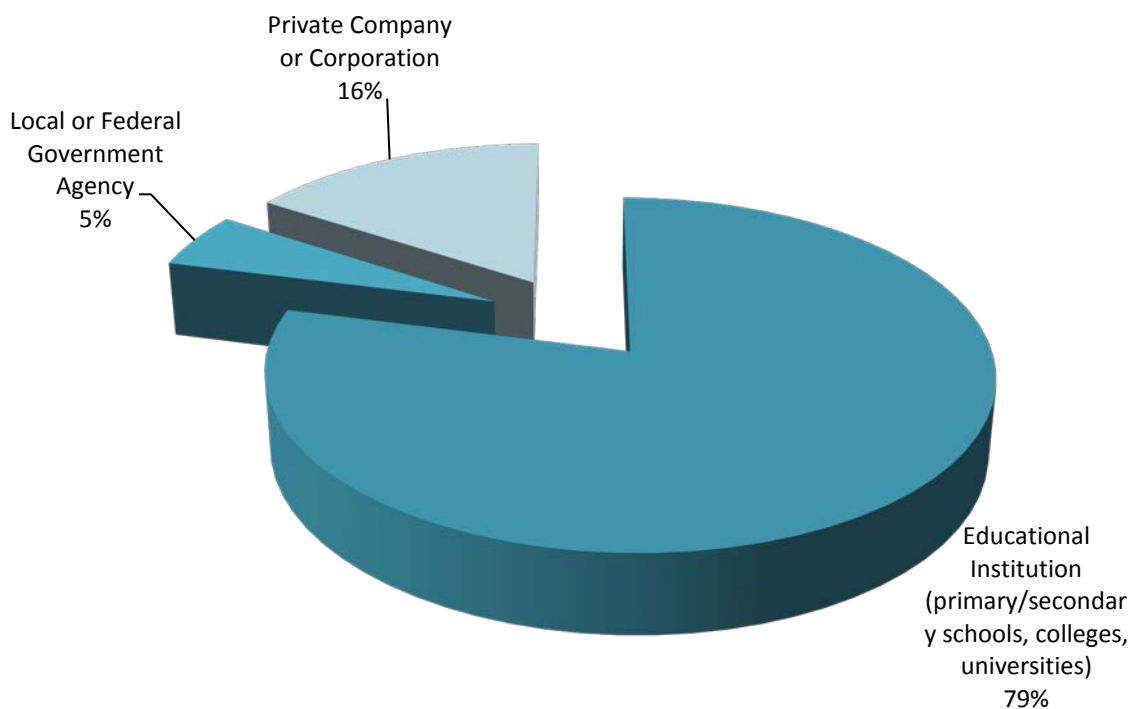
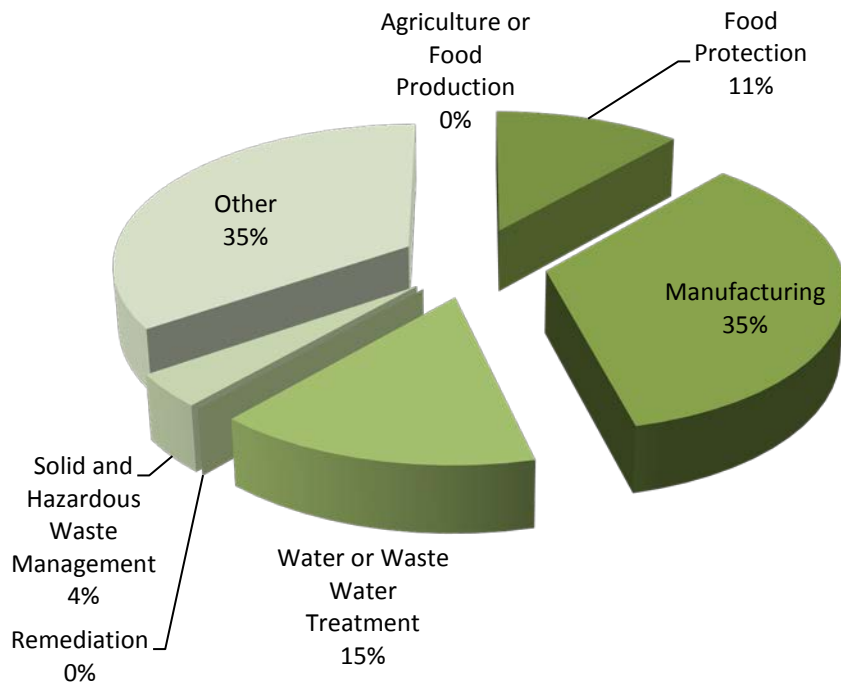


Figure 25

Supervisor's Primary Area of Work



“Other” includes: Retail/Distribution, Lead, Body Art Programs, Vector Surveillance, Multi Media Environmental Compliance, Drinking Water Protection, Occupational Safety, Industrial Hygiene, Public Health Regulatory Inspections, Institution and Child Care, Public Health

Supervisor Rating of Graduate Skills

Twenty supervisors were surveyed on the skill levels of graduates. All supervisors responded with job sector and primary work area information, which is presented in Tables 13-15.

Table 13. Supervisor Rating of Graduate Skills

Skills	Number of Respondents	Average
Information Technology/Computer Skills	20	4.13
Public Speaking	20	3.5
Technical Writing	20	3.52
Identify Reliable and Relevant Information	20	3.98
Drawing Appropriate Conclusions	20	3.95
Choosing and Defending an Appropriate Course of Action	20	3.83

Skills	Number of Respondents	Average
Conducting a statistical Analysis and interpreting Data	20	3.85
Applying Research Methods and Problem Solving	20	3.83
Leadership Skills	20	3.68
Organizing Work Flow	20	3.8
Project Planning and Management	20	3.92
Epidemiology	20	3.57
Toxicology	20	4.11
Risk Assessment	20	3.75
Risk Communication	20	3.75
Risk Management	20	3.86

Specialty Area Requirements of Jobs-All Respondents

Supervisors of graduates were asked to answer yes or no if the job required the following core competencies. The Figure below represents the responses of 18 Supervisors:

Table 14.

Job requires knowledge of:	Individual No	Individual Yes	N/A	Total	% No	% Yes
Air Quality Control	12	6	0	18	0.67	0.33
All-hazard Preparedness	6	12	0	18	0.33	0.67
Built Environment	10	8		18	0.56	0.44
Disease Prevention (e.g. vectorborne, zoonotic, etc.)	8	10	0	18	0.44	0.56
Environmental Health Planning	4	12	2	18	0.22	0.67
Food Protection	5	11	2	18	0.28	0.61
Geographical Information Systems (GIS)	10	8	0	18	0.44	0.56
Global environmental Health	9	7	2	18	0.50	0.39
Hydrogeology	15	2	1	18	0.83	0.11
Injury Prevention	7	10	1	18	0.39	0.44
institutional Health	10	8	0	18	0.44	0.56
Occupational Health and Safety	8	9	1	18	0.56	0.50
Radiation Health	11	6	1	18	0.61	0.33
Recreational Environmental Health	9	8	1	18	0.50	0.56
Risk Analysis	3	14	1	18	0.17	0.78
Soils	11	7	0	18	0.61	0.39
Solid and Hazardous Material and Waste Management	8	10	0	18	0.56	0.44
Vector Control	10	8	0	18	0.44	0.56
Water and Waste Water	6	12	0	18	0.33	0.67

Program Preparation - All Respondents

Supervisors of graduates were asked to answer yes or no if graduates were well-prepared in the following specialty areas. The Figure below represents the responses of 18 supervisors.

Table 15.

Degree to which EH Program prepared me in:	Not Prepared	Somewhat Prepared	Well Prepared	N/A	Total	% Somewhat Prepared	% Well Prepared
Air Quality Control	0	5	2	11	18	0.28	0.11
All-hazard Preparedness	0	8	4	6	18	0.44	0.22
Built Environment	1	3	4	10	18	0.17	0.22
Disease Prevention (vector-borne, zoonotic, etc.)	0	4	6	8	18	0.22	0.33
Environmental Health Planning	1	5	7	5	18	0.28	0.39
Food Protection	0	1	10	7	18	0.06	0.56
Geographical Information Systems (GIS)	1	6	2	9	18	0.33	0.11
Global environmental Health	0	5	3	10	18	0.28	0.17
Hydrogeology	0	4	0	14	18	0.22	0
Injury Prevention	0	4	7	7	18	0.22	0.39
Institutional Health	0	5	4	9	18	0.28	0.22
Occupational Health and Safety	0	5	5	8	18	0.28	0.28
Radiation Health	1	4	1	6	12	0.33	0.06
Recreational Environmental Health	0	3	6	9	18	0.17	0.33
Risk Analysis	1	7	7	15	30	0.23	0.39
Soils	1	5	1	7	14	0.36	0.06
Solid and Hazardous Material and Waste Management	0	7	3	10	20	0.35	0.17
Vector Control	0	4	4	8	16	0.25	0.22
Water and Waste Water	0	7	5	12	24	0.29	0.28

Specialty Areas Knowledge Needed

Seven of 18 Supervisor respondents indicated the following specific “other” specialty areas needed for the job.

Figure 16.

Spill Management and Pollution Prevention
Laboratory safety, indoor air quality, ergonomics, fire and life safety, occupational safety regulation compliance
Lead poisoning investigations
Public Health Preparedness Planning – Bioterrorism. All hazard preparedness relates more to EM
SDS authoring
Restaurant Plan Review
Casey would have benefited from some education on resume writing, interviewing, and how to work in an office (chain of command, e-mail etiquette, etc.)

Narrative and Discussion

EHAC accredits environmental health academic programs in order to create a cadre of educational institutions that produce environmental health graduates that are well prepared academically and have the fundamental and practical skills to successfully enter and thrive in the environmental health field. EHAC’s primary mission is to enhance the education and training of students in environmental health science and protection by ensuring that students receive premium quality education and training from institution of higher education.

The aggregation of supervisor and graduate assessments regarding skill level and preparedness presented in this report shows a moderate level of success for EHAC accredited organizations regarding the preparedness of environmental health graduates. As shown in Table 17 (below), graduates rate their preparedness in specialty areas at an average of 38% well prepared, while supervisors rate their new employees at average of 24% well prepared. These averages point to a moderate level of perceived competence in environmental health graduates, as well as, leaving ample room for improvement in a number of specialty areas. Highest levels of preparedness are reported by both graduates and supervisors for the following specialty areas:

- Food Protection (graded especially high by Supervisors)
- Built Environment,
- Disease Prevention,
- Environmental Health Planning,
- Risk Analysis,
- Vector Control, and
- Water and Waste Water.

The more challenging areas of preparedness include:

- Air Quality Control,
- Geographical Information Systems (GIS),
- Hydrogeology,
- Radiation Health, and
- Soils.

Table 17: Comparison of Graduate and Supervisor Responses

Specialty Area	Job requires knowledge of Specialty Area: Graduate Response %Yes	Job requires knowledge of Specialty Area: Supervisor Response %Yes	Graduate Assessment of Their Preparedness in Specialty areas % Somewhat Prepared	Graduate Assessment of Their Preparedness in Specialty areas % Well Prepared	Supervisor Assessment of Graduate Preparedness in Specialty Areas - % Somewhat Prepared	Supervisor Assessment of Graduate Preparedness in Specialty Areas - % Well Prepared
Air Quality Control	0.47	0.33	0.26	0.35	0.28	0.11
All-hazard Preparedness	0.65	0.67	0.23	0.51	0.44	0.22
Built Environment	0.35	0.44	0.23	0.51	0.17	0.22
Disease Prevention (e.g. vectorborne, zoonotic, etc.)	0.51	0.56	0.07	0.47	0.22	0.33
Environmental Health Planning	58.1	0.67	0.12	0.47	0.28	0.39
Food Protection	0.44	0.61	0.14	0.51	0.06	0.56
Geographical Information Systems (GIS)	0.28	0.56	0.02	0.12	0.33	0.11
Global environmental Health	0.23	0.39	0.16	0.26	0.28	0.17
Hydrogeology	0.23	0.11	0.09	0.12	0.22	0
Injury Prevention	0.56	0.44	0.19	0.37	0.22	0.39
Institutional Health	0.35	0.56	0.21	0.26	0.28	0.22
Occupational Health and Safety	0.56	0.5	0.14	0.44	0.28	0.28
Radiation Health	0.23	0.33	0.19	0.44	0.33	0.06
Recreational Environmental Health	0.32	0.56	0.19	0.30	0.17	0.33
Risk Analysis	0.65	0.78	0.12	0.54	0.23	0.39
Soils	0.3	0.39	0.16	0.19	0.36	0.06
Solid and Hazardous Material and Waste Management	0.53	0.44	0.21	0.30	0.35	0.17
Vector Control	0.33	0.56	0.28	0.37	0.25	0.22
Water and Waste Water	0.61	0.67	0.07	0.59	0.29	0.28

Figure 26 shows a graphic representation of graduate and supervisor rating of preparedness in environmental health specialty areas.

Figure 26

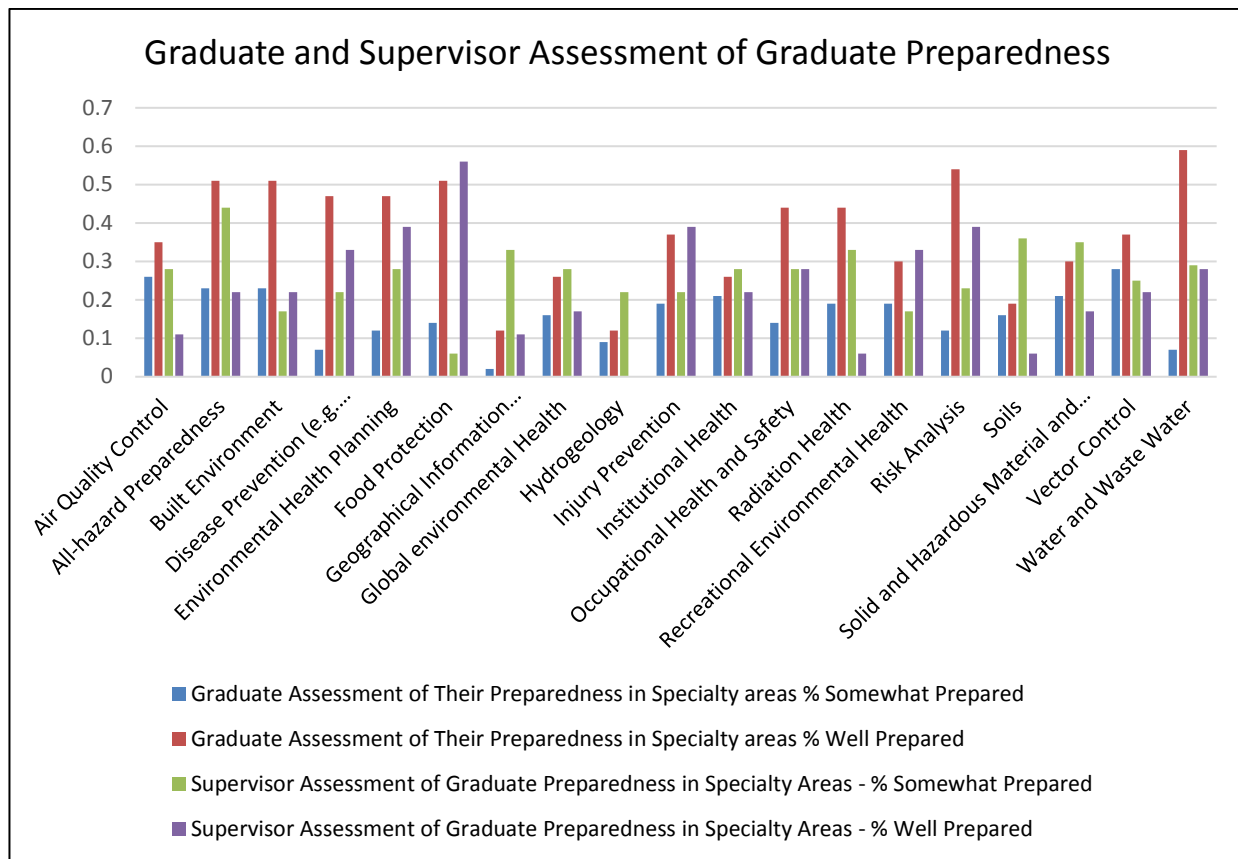


Figure 18 shows a similar satisfaction level of both graduates and supervisors regarding graduate skill levels in 18 different job skills areas. Graduates rate their skill levels at an average of 3.7 out of 5 (5 = best, 1 = worst) and supervisors rate recent graduates at an average of 3.8 out of 5. Graduates rank their skills related to Risk Management, Communication and Assessment lowest, while they report excelling in the areas of:

- Working in a Team Setting,
- Organizing Work Flow,
- Drawing Appropriate Conclusions, and
- Information Technology/Computer Skills.

Supervisors found high graduate skill levels in the areas of:

- Information Technology/Computer Skills,

- Working in a Team Setting,
- Toxicology,
- Identifying Reliable and Relevant Information,
- Project Planning and Management,
- Drawing Appropriate Conclusions,
- Identifying Reliable and Relevant Information Drawing Appropriate Conclusions.

Public speaking, technical writing, Epidemiology, and Time Management skills are ranked lowest by supervisors. Challenging areas cited by both graduates and supervisors include Public Speaking, Technical Writing, and Epidemiology.

Table 18: Comparison of Graduate's Job Skills Assessment with Supervisor Assessment of Graduate Skills (5 Most Proficient, 1 Least Proficient)

Skills	# of Graduate Responses	Graduate's Assessments of Skills - Average	# of Supervisor Respondents	Supervisor's Assessment of Skills - Average
Information Technology/Computer Skills	43	3.9	20	4.13
Public Speaking	43	3.6	20	3.5
Technical Writing	43	3.6	20	3.52
Identify Reliable and Relevant Information	43	4.0	20	3.98
Drawing Appropriate Conclusions	43	4.0	20	3.95
Choosing and Defending an Appropriate Course of Action	43	4.10	20	3.83
Conducting a statistical Analysis and interpreting Data	43	3.50	20	3.85
Applying Research Methods and Problem Solving	43	3.80	20	3.83
Working in a Team Setting	43	4.2	20	4.23
Leadership Skills	43	3.9	20	3.68
Organizing Work Flow	43	4.10	20	3.8
Time Management	43	3.8	20	3.65
Project Planning and Management	43	3.9	20	3.92
Epidemiology	43	3.60	20	3.57
Toxicology	43	3.70	20	4.11