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

Outcome Assessment Report 2015

EHAC Staff: Leslie Mitchell

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 self-study for re-accreditation purposes for a given institution. The Council will use the compiled information from all institutions undergoing re-accreditation to evaluate and modify the requirements of accreditation."

The outcome assessment tool consists of two surveys conducted through surveymonkey.com, one for graduates and one 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.

The following re-accreditation applicants responded to the outcome assessment survey:

Figure 1.

EHAC Re-Accreditation Applicants 2015	Program	Next Accreditation Review	Initial Accreditation	Graduating Classes reflected on OA	# of Graduate Respondents	# of Supervisor Respondents
Baylor University	Undergraduate	2016	2010	2011, 2013, 2014	6	1
Benedict College	Undergraduate	2016	2004	2012, 2013, 2015	4	0
Colorado State University	Undergraduate	2016	1973	2009-2015	56	27
Dickinson State University	Undergraduate	2016	2010	0	0	0
Mississippi Valley State University	Undergraduate	2016	1997	2011, 2012	2	0
Ohio University	Undergraduate	2016	1982	2011-2014	11	4
West Chester University	Undergraduate	2016	2008	2011	1	1

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 78 out of the 78 graduate survey respondents.

Chart 1

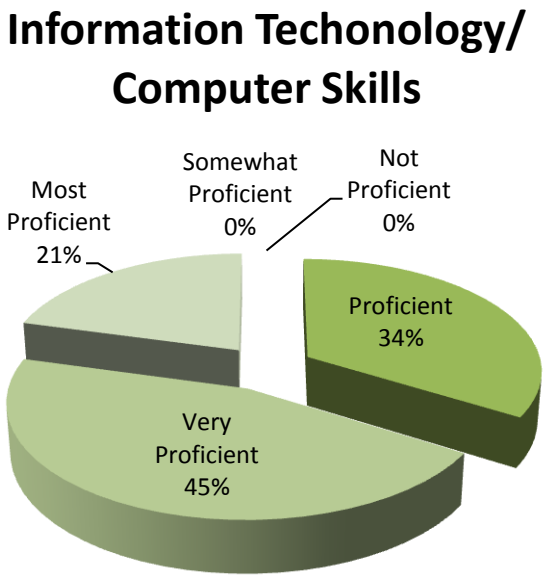


Chart 2

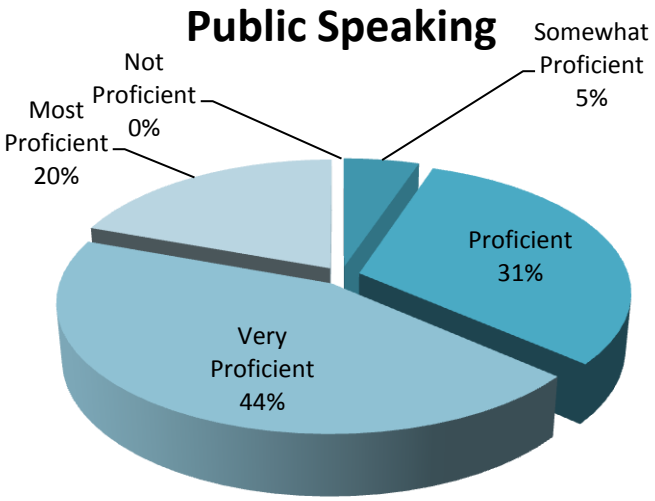


Chart 3

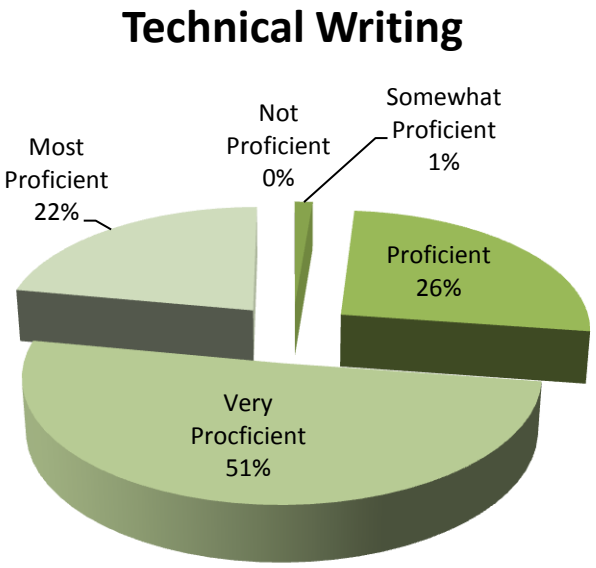
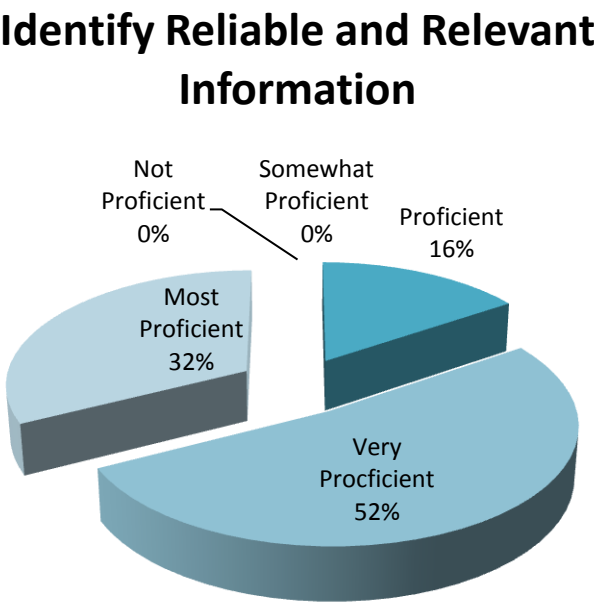


Chart 4



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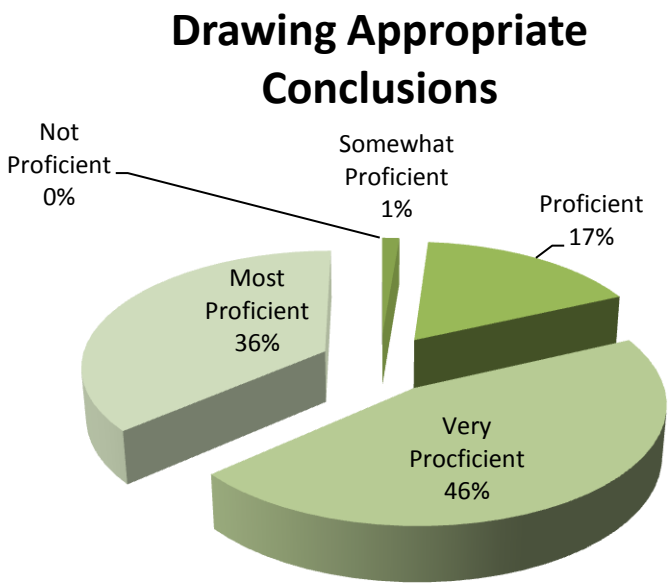

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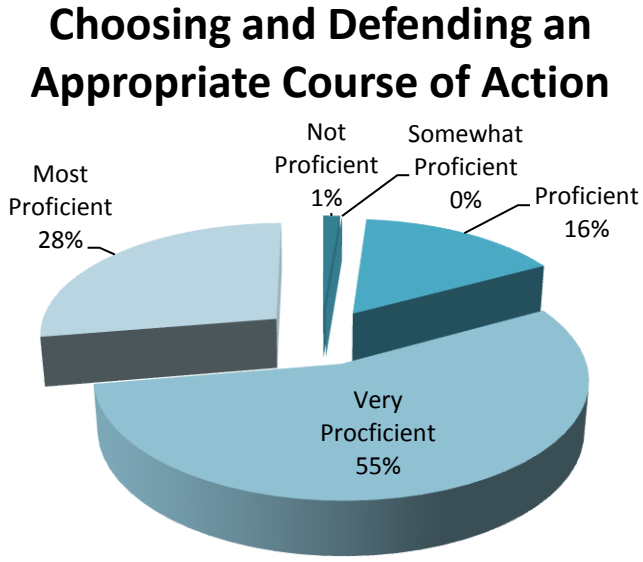

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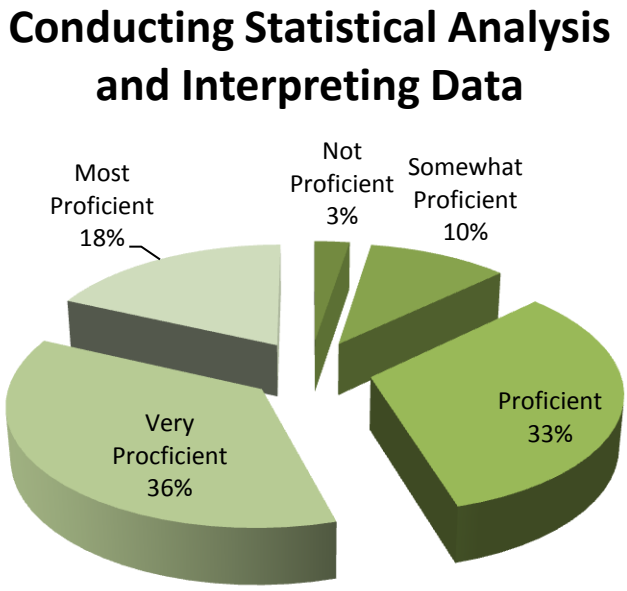

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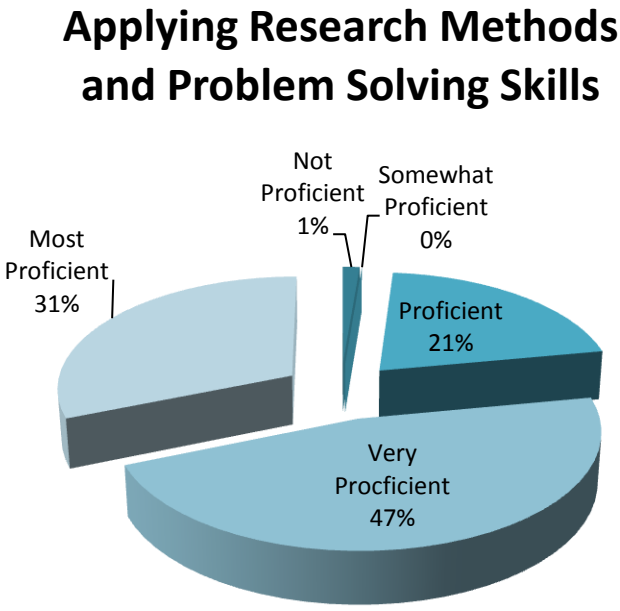

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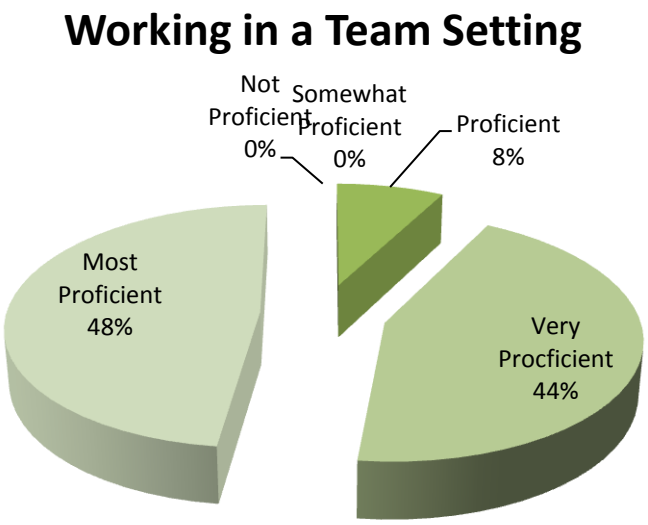

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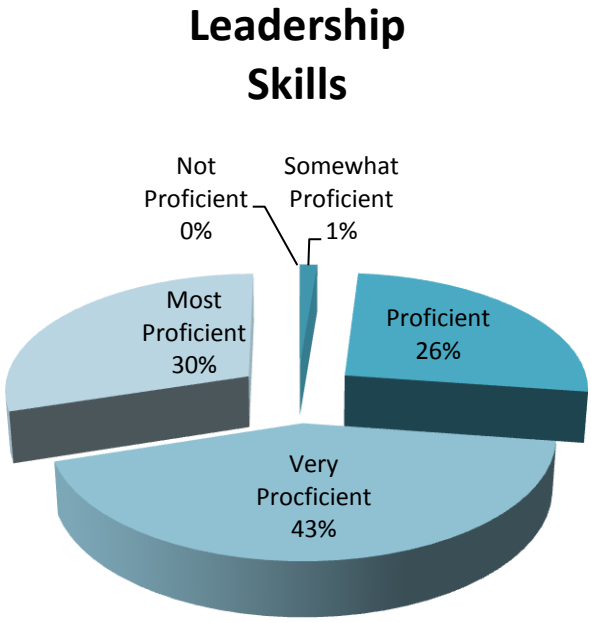
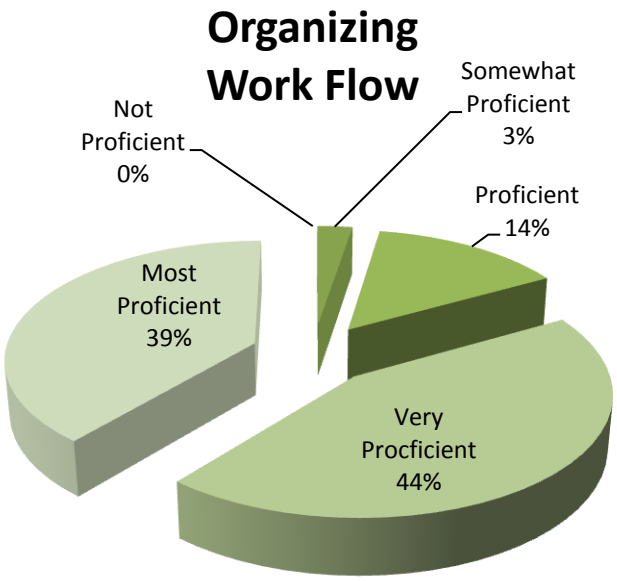


Chart 11



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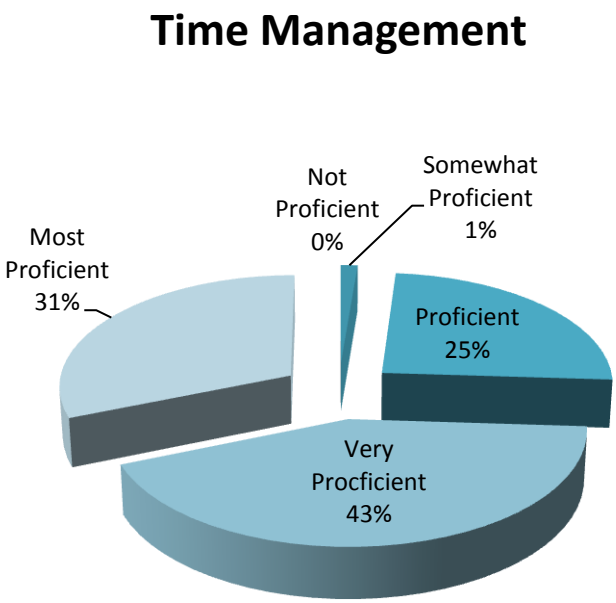

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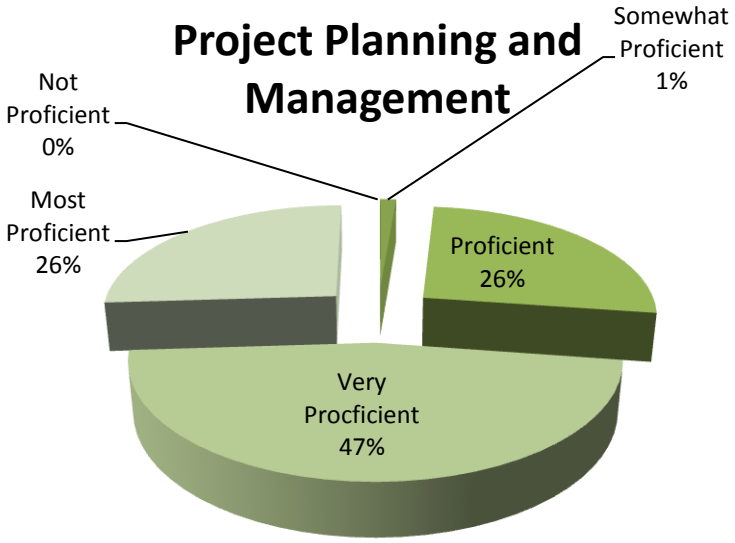

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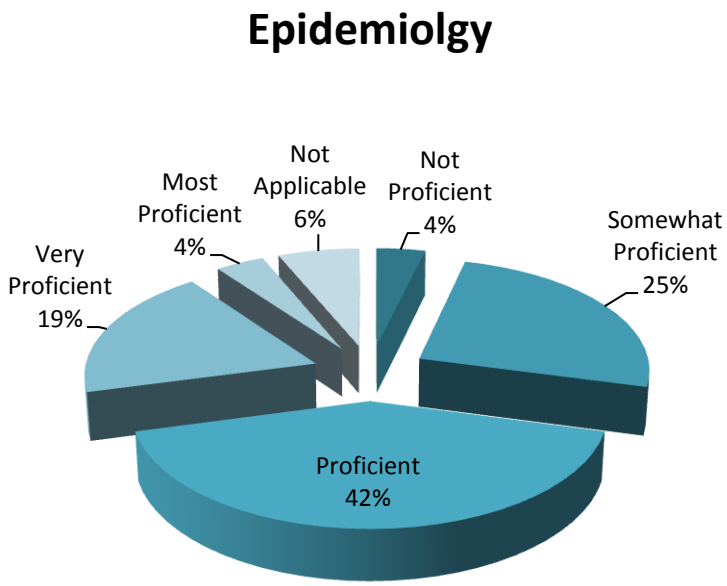


Chart 15

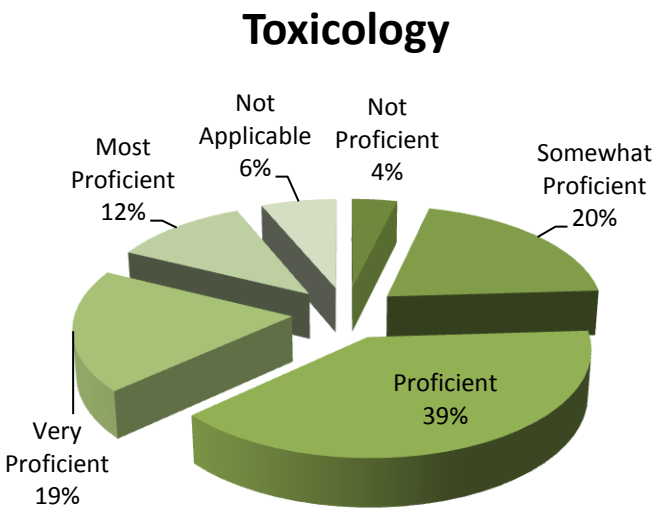
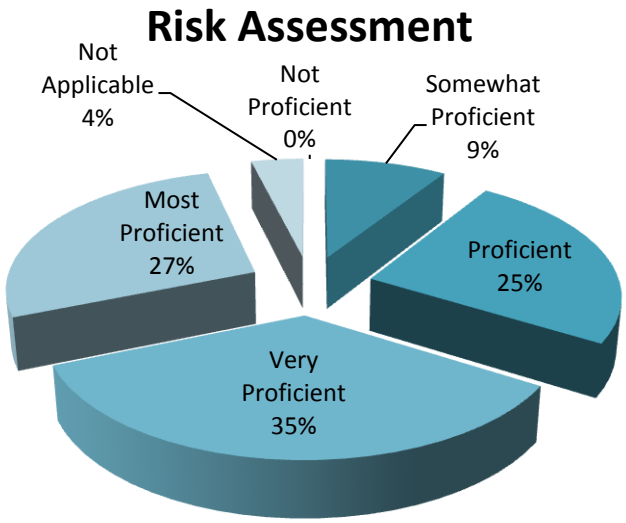


Chart 16



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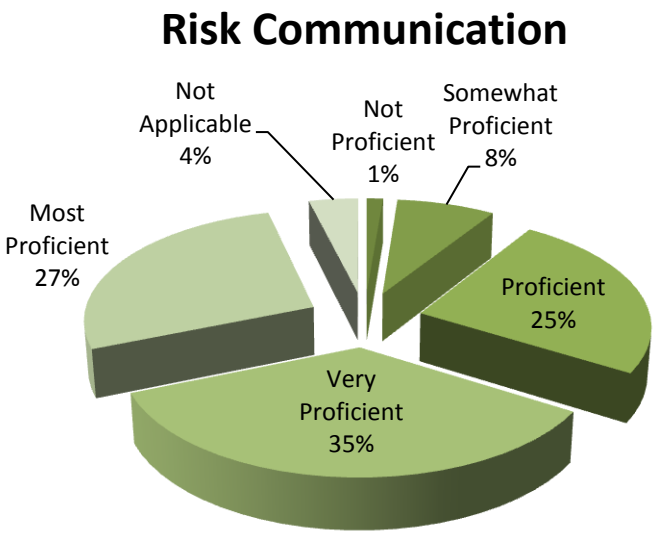

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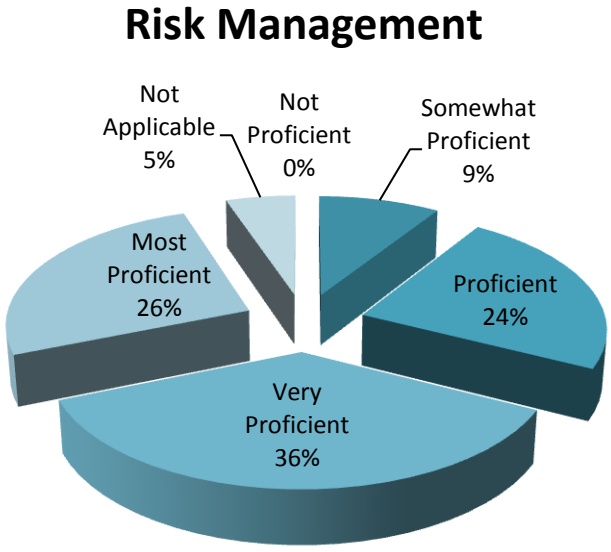


Skill Levels of Recent Graduates

Respondents were asked to rate their skill-level (5=Best, 1=Worst) in the following areas:

Figure 2.
Graduate Skills - All Respondents (5=Best, 1=Worst)

Skills	Number of Respondents	Average
Information Technology/Computer Skills	77	3.66
Public Speaking	77	3.79
Technical Writing	77	3.93
Identify Reliable and Relevant Information	77	4.17
Drawing Appropriate Conclusions	77	4.17
Choosing and Defending an Appropriate Course of Action	75	3.97
Conducting a statistical Analysis and interpreting Data	77	3.75
Applying Research Methods and Problem Solving	77	3.94
Working in a Team Setting	77	4.4
Leadership Skills	77	4.01
Organizing Work Flow	77	4.20
Time Management	77	4.04
Project Planning and Management	77	3.97
Epidemiology	79	2.70
Toxicology	79	3.14
Risk Assessment	77	3.69
Risk Communication	77	2.31
Risk Management	77	3.66

Course Relevance

Respondents were asked to answer yes or no if their job required knowledge in the following areas found in environmental health. The last two columns to the far right represent the respective percentages reflecting "knowledge required" and "knowledge not-required" in the jobs of survey respondents:

Figure 3.

Job requires knowledge of:	Individual Yes	Individual No	N/A	Total	% Knowledge Required	% Knowledge Not Required
Air Quality Control	36	36	0	72	0.50%	0.50%
All-hazard Preparedness	46	24	3	73	0.63%	0.33%
Built Environment	22	51	0	73	0.30%	0.70%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	30	44	0	74	0.41%	0.59%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	38	35	0	73	0.52%	0.48%
Environmental Health Planning	43	30	0	73	0.59%	0.42%
Food Protection	29	44	0	73	0.40%	0.60%
Geographical Information Systems (GIS)	18	55	0	72	0.25%	0.76%
Global environmental Health	14	58	0	72	0.19%	0.81%
Hydrogeology	14	58	0	72	0.19%	0.81%
Injury Prevention	44	28	0	72	0.61%	0.39%
Institutional Health	27	47	0	74	0.36%	0.64%
Occupational Health and Safety	28	24	0	52	0.54%	0.46%
Radiation Health	30	42	0	72	0.42%	0.58%
Recreational Environmental Health	27	43	0	70	0.39%	0.61%
Risk Analysis	54	18	0	72	0.75%	0.25%
Soils	22	50	0	72	0.31%	0.69%
Solid and Hazardous Material and Waste Management	48	27	0	75	0.64%	0.36
Vector Control	21	51	0	72	0.29%	0.71
Water and Waste Water	47	27	0	74	0.64%	0.36

Specialty Area Knowledge & Program Preparation-All Respondents

Respondents were asked to answer yes or no if they were well-prepared in the following specialty areas in their undergraduate program. The last two columns to the far right represent the percentages of all graduates who were well prepared and not prepared by their program:

Figure 4.

Degree to which EH Program prepared me in:	Well Prepared	Somewhat Prepared	Not Prepared	N/A	% Well Prepared	% Somewhat Prepared	% Not Prepared
Air Quality Control	16	21	1	0	0.42	0.55%	0.03%
All-hazard Preparedness	29	19	1	0	0.59	0.39%	0.02%
Built Environment	10	12	0	0	0.45	0.55%	0%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	25	5	0	0	0.83	0.17%	0%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	29	9	1	0	0.74	0.23%	0.03%
Environmental Health Planning	27	14	2	0	0.63	0.33%	0.05%
Food Protection	22	7	0	0	0.76	0.24%	0%
Geographical Information Systems (GIS)	4	11	5	0	0.20	0.55%	0.25%
Global environmental Health	9	5	0	0	0.64	0.36%	0%
Hydrogeology	6	6	1	0	0.46	0.46%	0.08%
Injury Prevention	32	12	1	0	0.71	0.27%	0.02%
Institutional Health	14	11	1	0	0.54	0.42%	0.04%
Occupational Health and Safety	40	8	1	0	0.82	0.16%	0.02%
Radiation Health	16	13	1	0	0.53	0.43%	0.03%
Recreational Environmental Health	14	11	1	0	0.54	0.42%	0.04%
Risk Analysis	37	13	4	0	0.69	0.24%	0.07%
Soils	8	9	6	0	0.35	0.39%	0.26%
Solid and Hazardous Material and Waste Management	30	18	1	0	0.61	0.37%	0.02%
Vector Control	13	8	0	0	0.62	0.38%	0%
Water and Waste Water	34	14	1	0	0.69	0.29%	0.02%

Graduate Work Place Data:

The pie chart below represents job sectors for graduates of the six schools surveyed. Of the respondents, 78 are currently working, 2 are not working\

Chart 19

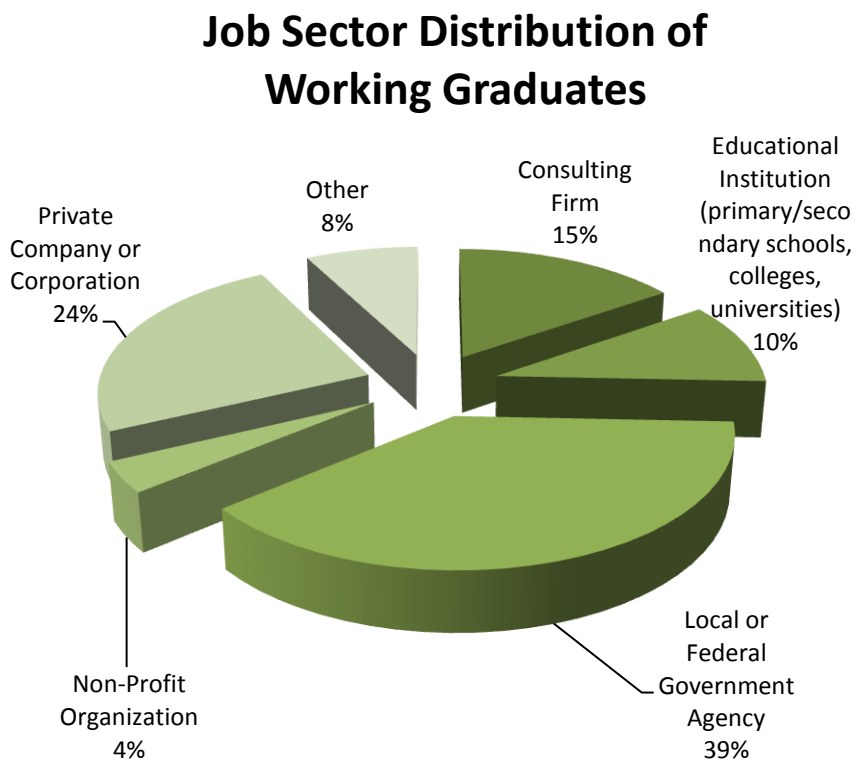
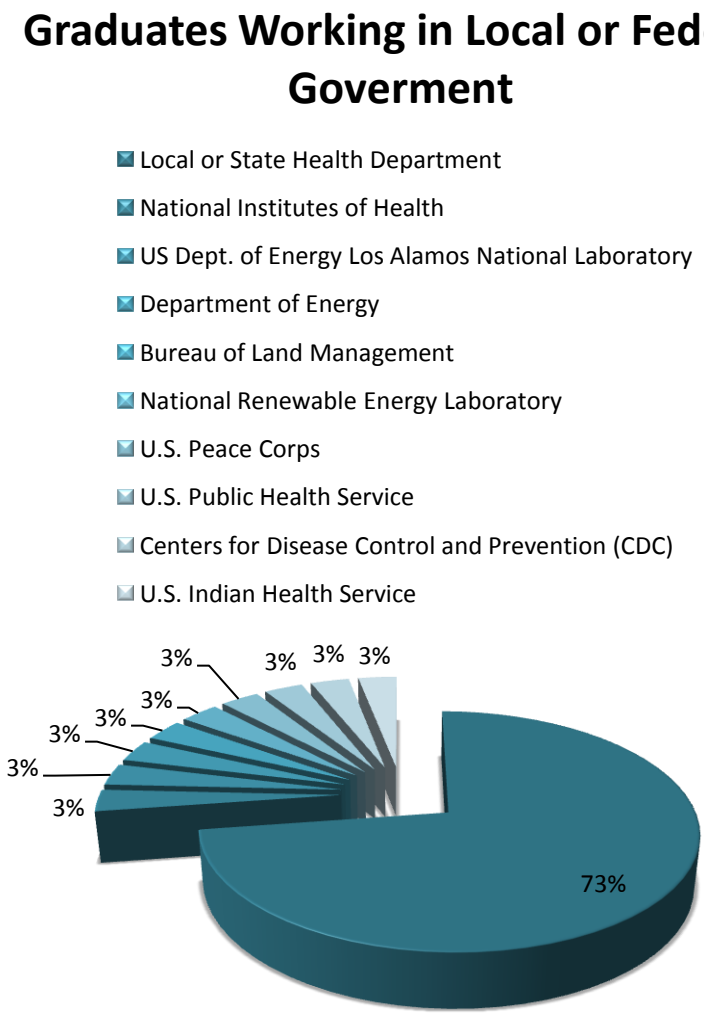


Chart 20


Graduates Working in Local or Federal Goverment
Local or State Health Department
National Institutes of Health
US Dept. of Energy Los Alamos National Laboratory
Department of Energy
Bureau of Land Management
National Renewable Energy Laboratory
U.S. Peace Corps
U.S. Public Health Service
Centers for Disease Control and Prevention (CDC)
U.S. Indian Health Service
3%
3%
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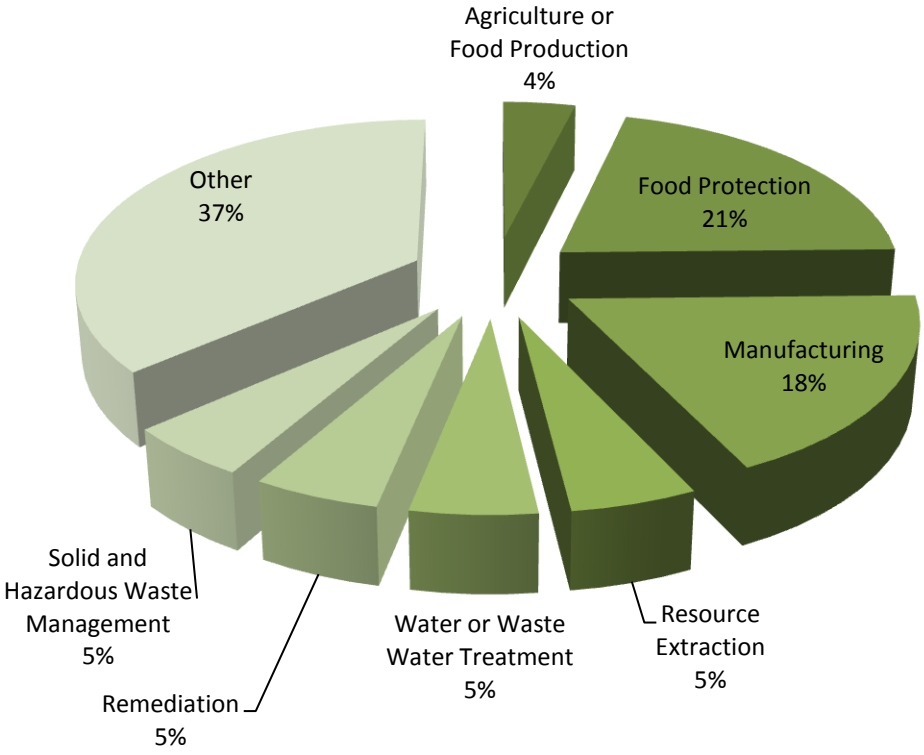
73%

Chart 21

Graduate's Primary Area of Work



"0ther" includes: Pharmacogenomics, Toxicology, Research, Manufacturing, Healthcare, Construction, Telecommunications, Animal health, Air Program, Zoonosis, Solid Waste and Recycling Management, Water, Waste Management, Safety, Radiation Protection, Providing OSHA Consultation services to private industry, Renewable Energy Research, Student Geology disaster prevention

Chart 22

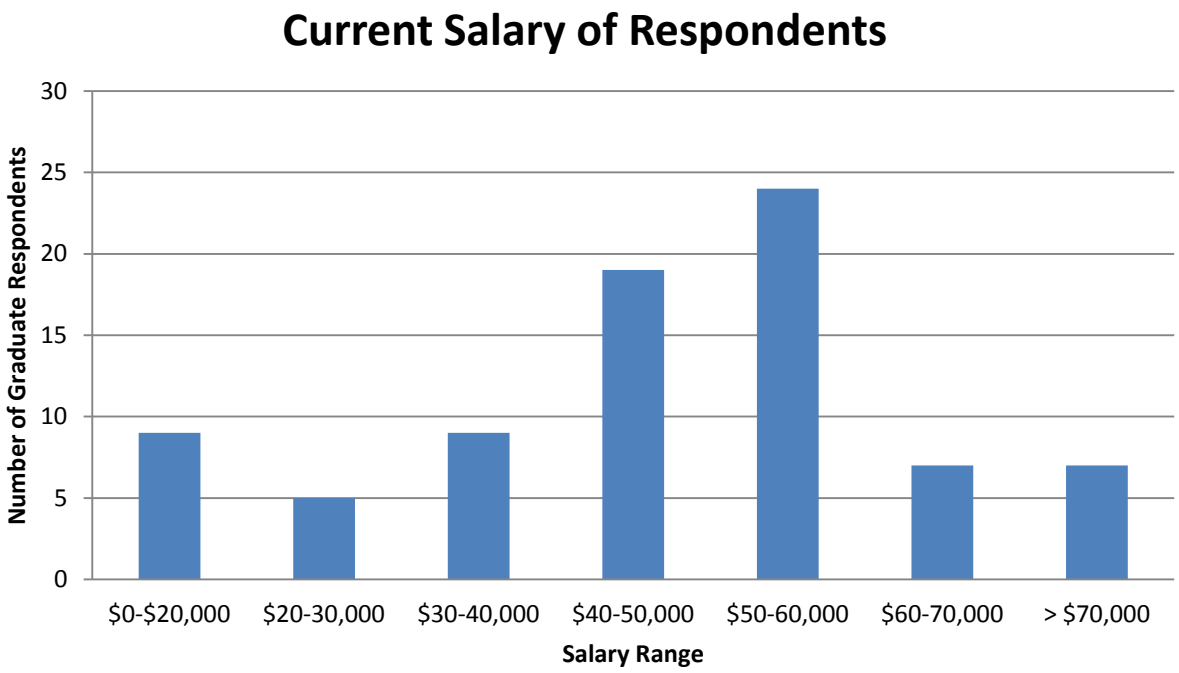
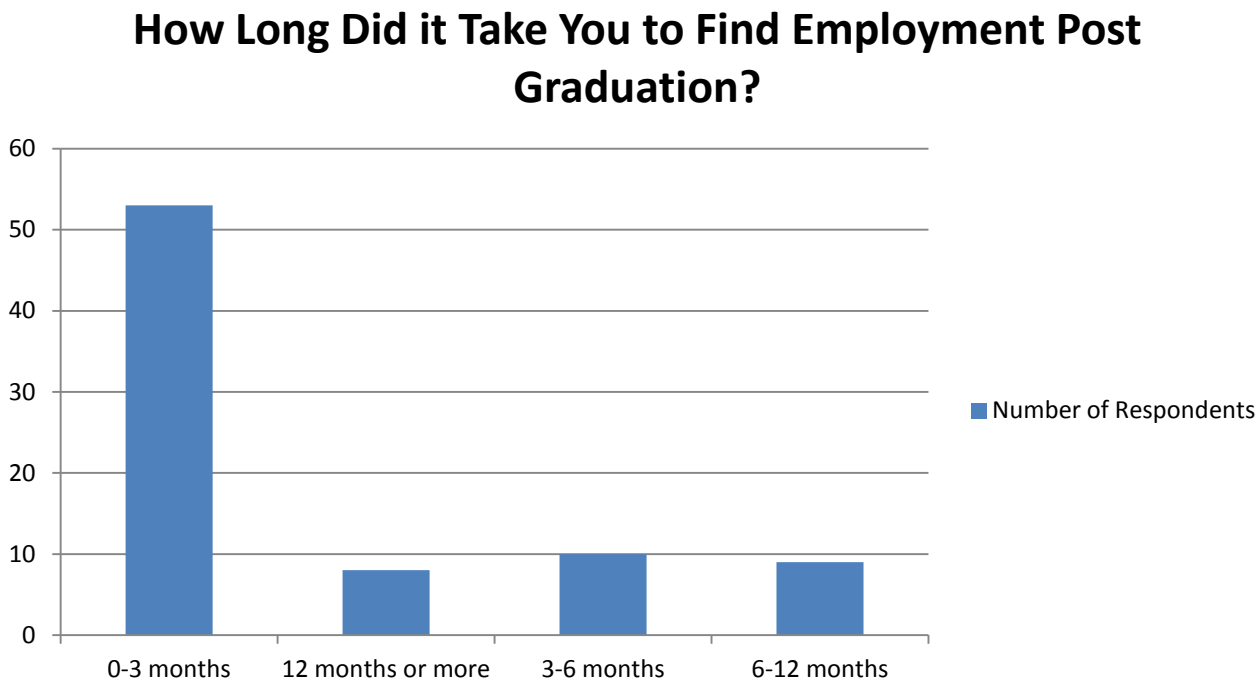


Chart 23



Specific Places of Employment

The following were listed as specific places of employment for 42 respondents indicating which one, other agency (please specify):

Figure 5.

Private Corporation
Work for a Consulting Firm
I am not working in Environmental Health
N/A or none

Graduate Data on Continuing Education and Professional Development

Post Undergraduate Education

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

Figure 6.

Number of Graduates that have Completed Post-baccalaureate Degrees	**Types of Master Degrees**
12	MS Environmental Health and Toxicology, MPH, MPH Environmental Health concentration, MS Exposure Science, MS Industrial Hygiene, MS Radiological Health Sciences, MS Health Physics

Professional Awards Received

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

Figure 7.

AEHAP Student of the Month (January 2013) AEHAP Student Research Competition Winner (July 2013) 1st Place Best Undergraduate Research Presentation, Society of Environmental Toxicology and Chemistry (November 2013) U.S. EPA Greater Research Opportunities Fellowship (August 2012-May 2014)
CDC Public Health Associate Fellowship Program
Creighton University School of Medicine Community Oriented Primary Care Scholarship
Elected president of CEHA
Employee of the month
Individual Achievement Awards and Team Achievement Awards
Kleinman grant for volcano research recipient (2012), Association of Environmental & Engineering Geologists grant/scholarship recipient (2013), Michigan Technological University graduate scholarship recipient (2012)
OSHA VPP Special Government Employee
Outstanding Environmental Health graduate for the class of 2013. -Completed a six month standardization process conducted by five Michigan Department of Agriculture Standardized Field Trainers. -Promoted from Public Health Sanitarian Technician to Public Health Sanitarian within 10 months of being hired.
Recipient of ERC grant

Credentials Achieved

The following were listed as specific certificate or credentialing exams passed by 42 respondents:

Figure 8.

40 hr HAZWOPER
Air Quality Visible Emission Evaluations
Certificate Radiation Safety
CDPHE Air Monitoring Specialist CDPHE Certified Asbestos Building Inspector 40 Hour HAZWOPER DOT Security and Awareness DOT Hazardous Materials Transport CDOT Commercial Drivers License Class C with HAZMAT Endorsement
CDPHE Building Inspector, CDPHE Air Monitoring Specialist, CDPHE Project Designer, NIOSH 582
Certificate: Infectious Disease Epidemiology accompanying MPH studies in Environmental and Occ Health
Certified Erosion Prevention & Sediment Control Inspector (CEPSCI) Class Three Landfill Operator Certification for Landfill Managers
Certified Food Protection Manager Certified Pool Operator
Certified Occupational Hearing Conservationist, PEC SafeL and Authorized Instructor.
DOT Hazardous Material Transportation Certification CDPHE Hazardous waste management Certification
FEMA NIMS FEMA NIMS Command System
Hazwoper and Hazwoper supervisor, First Aid, MSHA
National Association of Wastewater Technicians- Inspector; National Swimming Pool Foundation- Certified Pool Operator
OSHA 10 certification - general industry OSHA 10 certification- construction
OSHA 30-hr. General Industry Training Course National Safety Council Fundamental of Industrial Hygiene PEC Premier SafeLand USA Oil Field Safety American Red Cross First Aid/CPR Certified
OSHA 40 Hour hazwoper MSHA Training
part 1 of the Certified Health Physics exam. This exam is managed by the American Board of Health Physics
Part I of the Certified Health Physicist Exam (American Academy of Health Physics)
Radiation Safety Officer, preparing for ASP exam
Registered Environmental Health Specialist
registered professional sanitarian, registered professional environmental specialist
REHS/RS, CPO, AFO, ServSafe Instructor, NV Restricted-Use Pesticide Applicator
REHS-IT
RS
REHS
Standardization Certificate for Retail Food Establishment CPOW - visual and tactile evaluation Training Reduced Oxygen Packaging Environmental Health Training in Emergency Response - Center for Domestic Preparedness
State Certified Asbestos Building Inspector
State of Ohio Registered Sanitarian
Stormwater Management and Erosion Control Training Western States Project Environmental Enforcement Training Verbal Judo Training
TCEQ Class C Surface Water Operator License
Teaching certificate
USMLE Step 1 USMLE Step 2 CK USMLE Step 2 CS BLS ACLS

Professional Organizations

Forty-seven graduate respondents indicated involvement in the professional organizations listed below:

Figure 9.

ACGIH
ACGIH member only
AIHA - member; ASSE - member; VPPPA - member
AIHA-RMS, member only ASSE-Colorado Chapter, member only
American College of Preventive Medicine
American Conference of Industrial Hygienists - Member
American Industrial Hygiene Association American Society of Safety Engineers
American industrial hygiene association - member American society for safety and engineering- member
American Industrial Hygiene Association member Colorado Environmental Professionals Association member American Conference of Governmental Industrial Hygienists member
ASSE
ASSE - member Carolina Air Pollution Control Association - member NEHA - member
Assist City of Fort Collins in rule-making for Air Pollution Control,
CEHA (Member), NEHA (Member)
CEHA, WCAEHO - just member
Colorado Environmental Health Association: President
Colorado Environmental Health Association-Member
Colorado Safety Association - member Colorado Environmental Health Association - member
Delta Omega Chapter member; American Public Health Association member
Georgia Environmental Health Association, INC.
Health Physics Society - member
health physics society - member only
Health Physics Society member
I participate in Industrial Hygiene Proficiency Analytical Testing quarterly so that the firm I work for can maintain it's lab accreditation
member only CEHA, NEHA, CPOW, NOWRA
Member, CEHA Member, CACVT
Michigan Environmental Health Association, member only. National Environmental Health Association, member only.
National Environmental Health Association (member only), Colorado Environmental Health Association (member only)
National Environmental Health Association (member) Colorado Professionals in Onsite Wastewater (member)
NEHA
NEHA - member only
CEHA - Member only
OEHA Member Only
New Mexico Environmental Health Association-Member
OEHA Past President
Ohio Environmental Health Association

Oklahoma society of environmental health professionals
Society of Environmental Toxicology and Chemistry
Society of Environmental Toxicology and Chemistry (Vice-Chair of North America Student Advisory Council) Society of Toxicology
Southeast Ohio sanitarian association
Texas Master Naturalists- Member Audubon Society- Member

Supervisor Survey Results

Background:
Thirty-three supervisors were surveyed on the skill levels of graduates. Ten supervisors responded with job sector and primary work area information, which is presented in Charts 22-24.

Chart 24

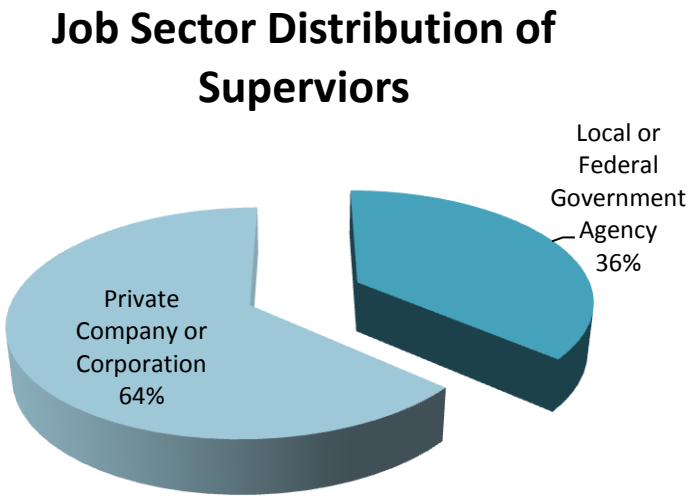
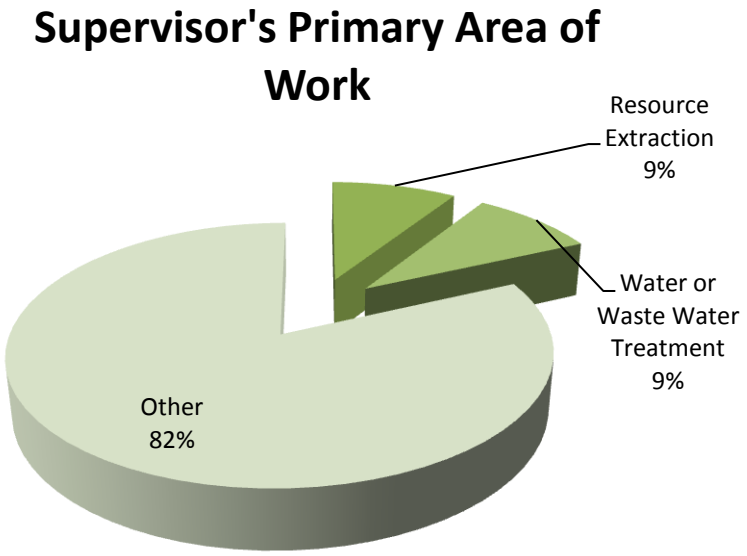


Chart 25



"Other" includes environmental health & safety, recycling stormwater compliance, recycling, and grants management.

Figure 10.
Supervisor Rating of Graduate Skills - All Respondents (5=Best, 1=Worst)

Skills	Number of Respondents	N/A	Average
Information Technology/Computer Skills	33	0	4.1
Public Speaking	33	0	3.67
Technical Writing	33	0	3.82
Identify Reliable and Relevant Information	33	0	4.3
Drawing Appropriate Conclusions	33	0	4.24
Choosing and Defending an Appropriate Course of Action	33	0	3.97
Conducting a statistical Analysis and interpreting Data	33	0	3.85
Applying Research Methods and Problem Solving	33	0	4.1
Working in a Team Setting	33	0	4.33
Leadership Skills	33	0	3.7
Organizing Work Flow	33	0	3.88
Time Management	33	0	4
Project Planning and Management	33	0	3.97
Epidemiology	33	21	3.67
Toxicology	33	17	3.73
Risk Assessment	33	5	3.77
Risk Communication	33	7	3.96
Risk Management	33	8	3.3

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 33 supervisors:

Figure 11.

Job requires knowledge of:	Individual Yes	Individual No	N/A	% Required	% Not Required
Air Quality Control	13	16	0	0.45%	0.55%
All-hazard Preparedness	19	9	0	0.68%	0.32%
Built Environment	4	23	0	0.15%	0.85%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	7	21	0	0.25%	0.75%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	6	22	0	0.21%	0.79%
Environmental Health Planning	14	14	0	0.50%	0.50%
Food Protection	6	22	0	0.21%	0.79%
Geographical Information Systems (GIS)	3	25	0	0.11%	0.89%
Global environmental Health	3	25	0	0.11%	0.89%
Hydrogeology	3	25	0	0.11%	0.89%
Injury Prevention	18	11	0	0.62%	0.38%
Institutional Health	7	21	0	0.25%	0.75%
Occupational Health and Safety	18	12	0	0.60%	0.40%
Radiation Health	21	8	0	0.72%	0.28%
Recreational Environmental Health	6	22	0	0.21%	0.79%
Risk Analysis	20	10	0	0.67%	0.33%
Soils	6	22	0	0.21%	0.79%
Solid and Hazardous Material and Waste Management	18	10	0	0.64%	0.36%
Vector Control	7	21	0	0.25%	0.75%
Water and Waste Water	16	12	0	0.57%	0.43%

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 33 supervisors.

Figure 12.

Graduate/Employee Preparedness	Well Prepared	Somewhat Prepared	Not Prepared	N/A	% Well Prepared	% Not Prepared
Air Quality Control	9	4	0	0	0.69%	0%
All-hazard Preparedness	12	8	0	0	.60%	0%
Built Environment	3	1	0	0	0.75%	0%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	6	1	0	0	0.86%	0%
Disease Prevention (e.g. vector-borne, zoonotic, etc.)	5	1	0	0	0.83%	0%
Environmental Health Planning	12	2	0	0	0.86%	0%
Food Protection	6	0	0	0	100%	0%
Geographical Information Systems (GIS)	2	1	0	0	0.67%	0%
Global environmental Health	2	1	0	0	0.67%	0%
Hydrogeology	2	1	0	0	0.67%	0%
Injury Prevention	12	6	0	0	0.67%	0%
Institutional Health	4	0	0	0	100%	0%
Occupational Health and Safety	9	9	0	0	0.50%	0%
Radiation Health	4	3	0	0	0.57%	0%
Recreational Environmental Health	4	2	0	0	0.67%	0%
Risk Analysis	16	4	0	0	0.80%	0%
Soils	3	2	1	0	0.50%	0.16%
Solid and Hazardous Material and Waste Management	11	6	1	0	0.61%	0.55%
Vector Control	5	2	0	0	0.71%	0%
Water and Waste Water	10	5	1	0	0.63%	0.6%

Specialty Areas Knowledge Needed

Of the 33 surveyed supervisors, 4 indicated the following specific "other" specialty areas needed for the job.

Figure 13.

Storm water
Industrial Hygiene-Somewhat Prepared
Asbestos management Biological safety Ergonomics Hearing protection Construction safety Sustainability
He stepped into a health physics position and has done great with on the job training, but a little more knowledge in radiological control would have been helpful. We have a hard time finding people who have the air control background and radiological control as well.

Narrative

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 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 students receive premium quality education and training form institution of higher education.

An aggregation of supervisor and graduate responses to skill level and preparedness assessments presented in this report shows a high level of success for EHAC accredited organizations regarding the preparedness of environmental health graduates from both the graduate and the supervisor perspectives. As shown in Figure 13, graduate rate their preparedness in specialty areas at an average of 61% well prepared, while supervisors rate their new employees at average of 71% well prepared. These averages point to a high level of competence for environmental health graduates as well as leaving room for improvement in a number of specialty areas including air quality control, soils, occupational health and safety, built environment and hydrology, where assessments levels were slightly lower. Both graduates and supervisors reported lower levels of preparedness in radiation health in particular.

Figure 13. Comparison of Graduate and Supervisor Responses Regarding Knowledge Required and Graduate Preparedness

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 - % Well Prepared	Supervisor Assessment of Graduate Preparedness in Specialty Areas - % Well Prepared
Air Quality Control	0.50%	0.45%	0.42%	0.69%
All-hazard Preparedness	0.68%	0.68%	0.59%	0.60%
Built Environment	0.30%	0.15%	0.45%	0.75%
Disease Prevention (e.g. vectorborne, zoonotic, etc.)	0.41%	0.25%	0.83%	0.86%
Disease Prevention (e.g. vectorborne, zoonotic, etc.)	0.52%	0.21%	0.74%	0.83%
Environmental Health Planning	0.59%	0.50%	0.63%	0.86%
Food Protection	0.40%	0.21%	0.76%	100%
Geographical Information Systems (GIS)	0.25%	0.11%	0.67%	0.67%
Global environmental Health	0.19%	0.11%	0.64%	0.67%
Hydrogeology	0.19%	0.11%	0.46%	0.67%
Injury Prevention	0.61%	0.62%	0.71%	0.67%
Institutional Health	0.36%	0.25%	0.54%	100%
Occupational Health and Safety	0.54%	0.60%	0.82%	0.50%
Radiation Health	0.42%	0.72%	0.53%	0.57%
Recreational Environmental Health	0.39%	0.21%	0.54%	0.67%
Risk Analysis	0.75%	0.67%	0.69%	0.80%
Soils	0.31%	0.21%	0.35%	0.50%
Solid and Hazardous Material and Waste Management	0.64%	0.64%	0.61%	0.61%
Vector Control	0.29%	0.25%	0.62%	0.71%
Water and Waste Water	0.64%	0.57%	0.69%	0.63%

Figure 14 also shows a high level of satisfaction of both graduates and supervisors regarding the skill level of graduates in eighteen different job skills areas, with graduates rating their skill levels at an average of 3.75 out of 5 (5 = best, 1 = worst) and supervisors rating recent graduates at an average of 3.91 out of 5. Epidemiology and risk communication were the lowest ranked skill levels for graduates rating themselves, while public speaking and risk management were ranked lowest by supervisors. Challenging areas cited by both graduates and supervisors include information technology/computer skills, public speaking, technical writing, choosing and defending and appropriate course of Action, conducting a statistical analysis and interpreting data, applying research methods and problem solving, project planning and management, epidemiology, toxicology, risk assessment, risk communication, and risk management.

Figure 14. Comparison of Graduate's Job Skills Assessment with Supervisor Assessment of Graduate Skills (5 = Best, 1 = Worst)

Skills	# of Graduate Respondents	Graduate's Assessment of Skills - Average	# of Supervisor Respondents	Supervisor's Assessment of Graduate Skills - Average
Information Technology/Computer Skills	77	3.66	33	4.10
Public Speaking	77	3.79	33	3.67
Technical Writing	77	3.93	33	3.82
Identify Reliable and Relevant Information	77	4.17	33	4.30
Drawing Appropriate Conclusions	77	4.17	33	4.24
Choosing and Defending an Appropriate Course of Action	75	3.97	33	3.97
Conducting a statistical Analysis and interpreting Data	77	3.75	33	3.85
Applying Research Methods and Problem Solving	77	3.94	33	4.10
Working in a Team Setting	77	4.40	33	4.33
Leadership Skills	77	4.01	33	3.70
Organizing Work Flow	77	4.20	33	3.88
Time Management	77	4.04	33	4.00
Project Planning and Management	77	3.97	33	3.97
Epidemiology	79	2.70	33	3.67
Toxicology	79	3.14	33	3.73
Risk Assessment	77	3.69	33	3.77
Risk Communication	77	2.31	33	3.96
Risk Management	77	3.66	33	3.30