NATIONAL ENVIRONMENTAL HEALTH SCIENCE AND PROTECTION ACCREDITATION COUNCIL (EHAC)

# Undergraduate Outcome Assessment Report

Compiled by Leslie Mitchell

This report details the analysis of the data provided by former undergraduates and their Supervisors of the programs seeking re-accreditation during the 2017-2018 academic year.

## Background:

The EHAC Undergraduate Requirements 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 undergraduates/current employees 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.

## Survey Context and Summary

EHAC' core mission is to accredit Environmental Health (EH) Programs that provide a scientifically rigorous and practical based education, which prepares graduates to enter the EH field "work force ready" and prepared to problem solve using critical thinking skills acquired during their university education. Toward this end, EHAC is continuously identifying strengths and weaknesses related to graduates successfully entering and progressing in the EH field of their choice. Survey responses from both graduates employed in the EH field and their supervisors assist EHAC in assessing and adapting Undergraduate Requirements and Graduate Guidelines for accreditation to the ever-evolving arena of Environmental Health.

Questions for both graduates and their supervisors focus on assessing the adequacy and effectiveness of a graduate's knowledge, skills and abilities related to their EH job, with graduates conducting a self -assessment and supervisors evaluating their current employees.

The following report provides a graphic representation of the results of the surveys with Undergraduate program employees and their Supervisors presented first, followed by Graduate program employees and their Supervisors.

Table 1 presents the six EHAC accredited Undergraduate programs re-accredited in 2018 the number of Supervisor responses, Undergraduate employee responses and the graduation dates represented by former undergraduate respondents. There were 50 total undergraduate respondents to the survey. Forty-one of these respondents are currently employed in EH related professions and are the focus of this report.

**Table 1. 2017-2018 Outcome Assessment Respondents – Undergraduate Programs**

| Re-accreditation Applicants | Next Accreditation Review | Initial Accreditation Year | Graduating Classes Reflected | Number of Undergraduate/ Employee Respondents | Number of Supervisor Respondents |
|---|---|---|---|---|---|
| Boise State University | 2018 | 1982 | 2004, 2007, 2008, 2011, 2013, 2014, | 8 | 4 |
| East Carolina University | 2018 | 1975 | 2006, 2008, 2016, 2017 | 6 | 3 |
| East Tennessee State University | 2018 | 1969 | 2011, 2013 ,2016, 2017 | 7 | 0 |
| Eastern Kentucky University | 2018 | 1985 | No responses | 0 | 0 |
| University of Findlay | 2018 | 2012 | 2003, 2004, 2006-2009, 2011-2017 | 22 | 5 |
| University of Georgia | 2018 | 1984 | 2012, 2013, 2017 | 7 | 1 |
| Totals | | | | 50 | 13 |
| Respondents Employed in Environmental Health Field | | | | 41 | |

## Undergraduate Skills

Listed below are core competencies in environmental health programs. Respondents were asked to choose the option that most closely describes their skill level. The percentages reflect 41 graduate survey respondents.

Charts 1-3 present undergraduate self-assessments of general job skills, interpersonal office skills and skills related to interpreting data. Overwhelmingly, undergraduates rated themselves either very or most proficient among these categories. Challenging areas for undergraduates include:

- It/Computer Skills;
- Technical Writing;
- Leadership skills;
- Organizing Work Flow; and
- Project Planning and Management Skills.

Environmental Specialty areas rating the highest in proficiency among undergraduates included Risk Assessment, Risk Communication and Risk Management, while epidemiology and toxicology are cited as the most challenging by undergraduate employees (Chart 4).

**Chart 1.**

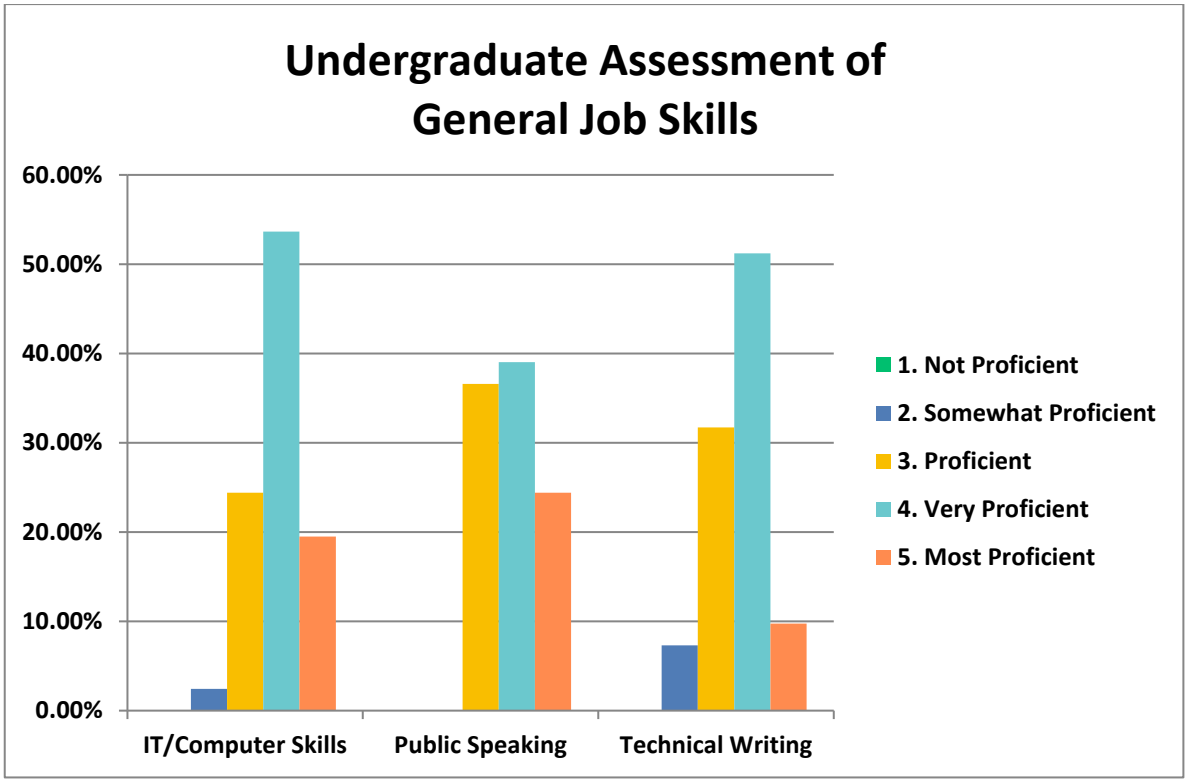


**Chart 2.**

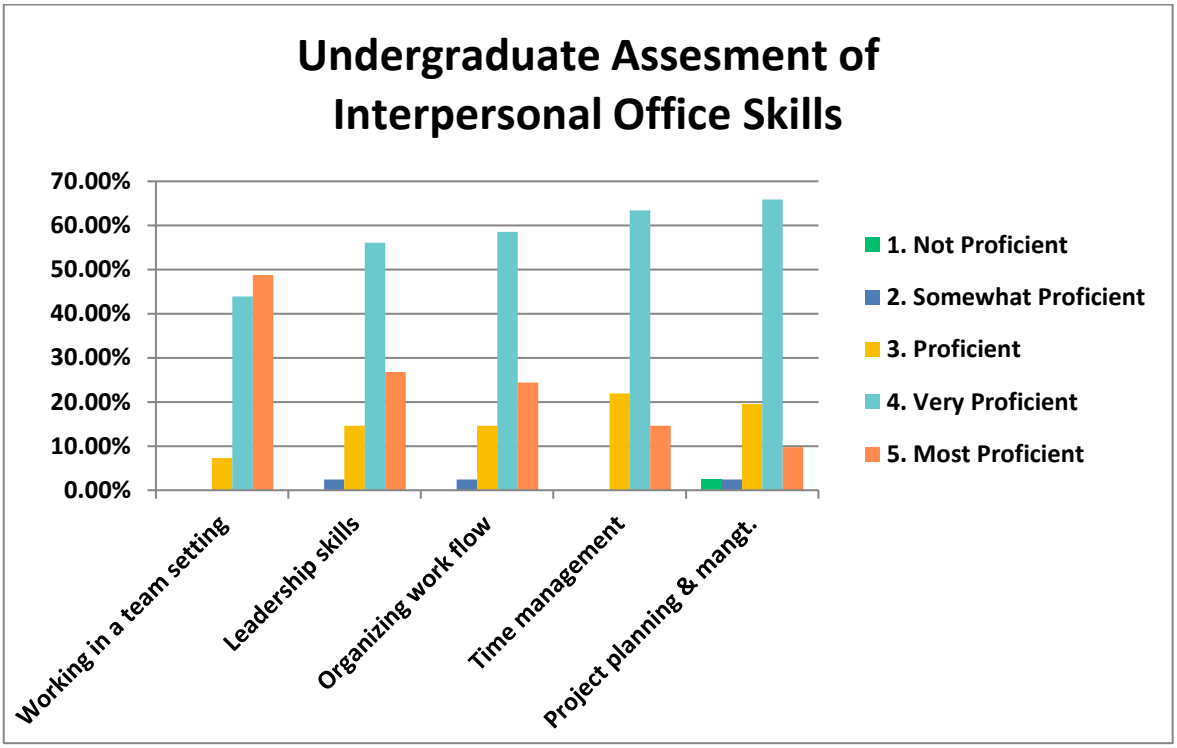



**Chart 3.**

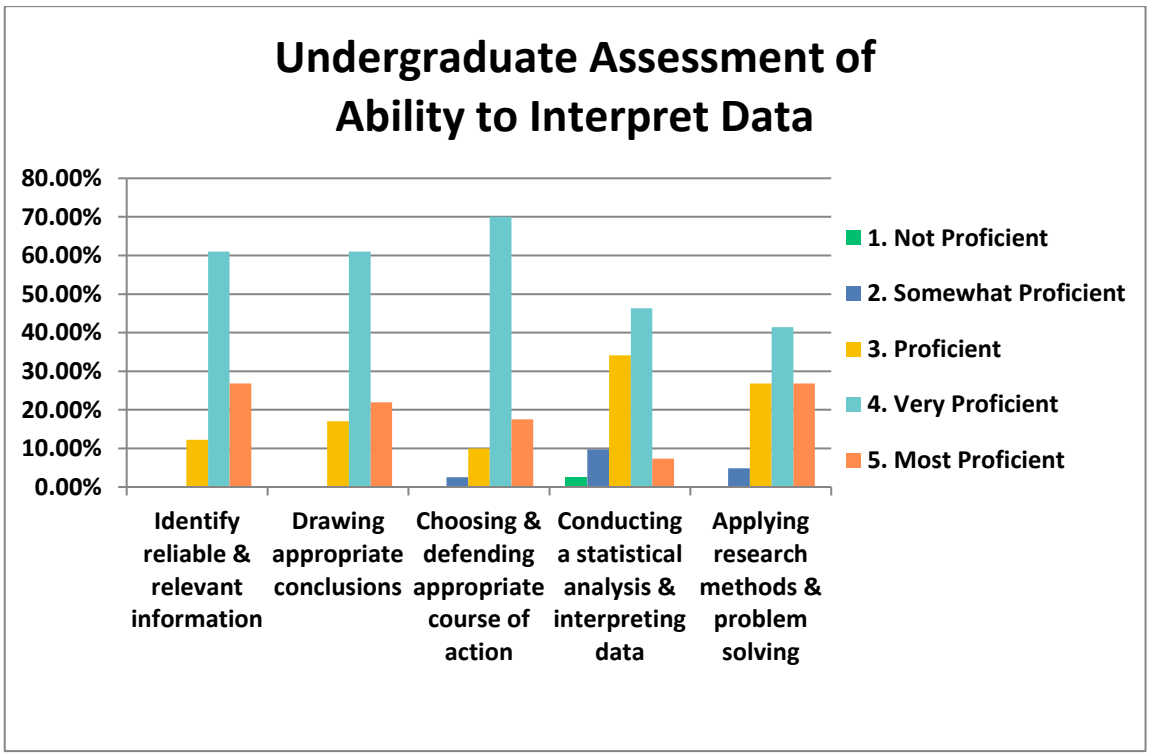
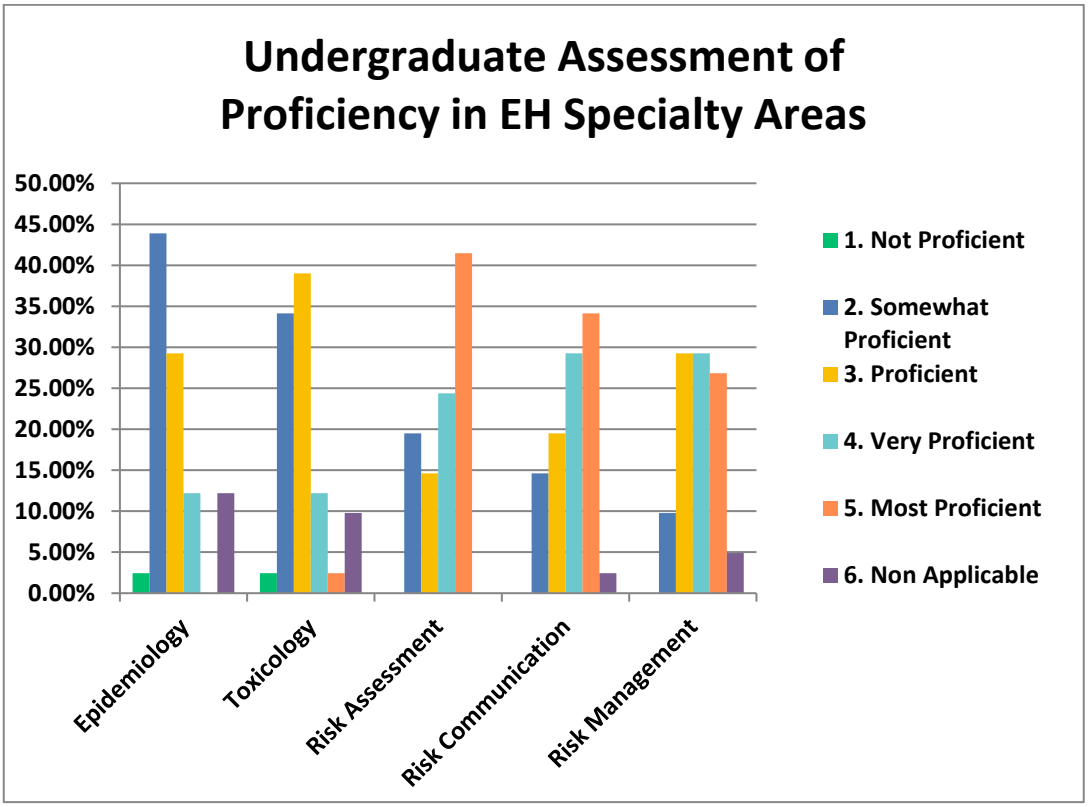


**Chart 4.**




**Course Relevance**

Undergraduate respondents were asked to answer yes or no if their job required knowledge in the following areas found in environmental health. The EH specialty areas cited most by Undergraduates included:

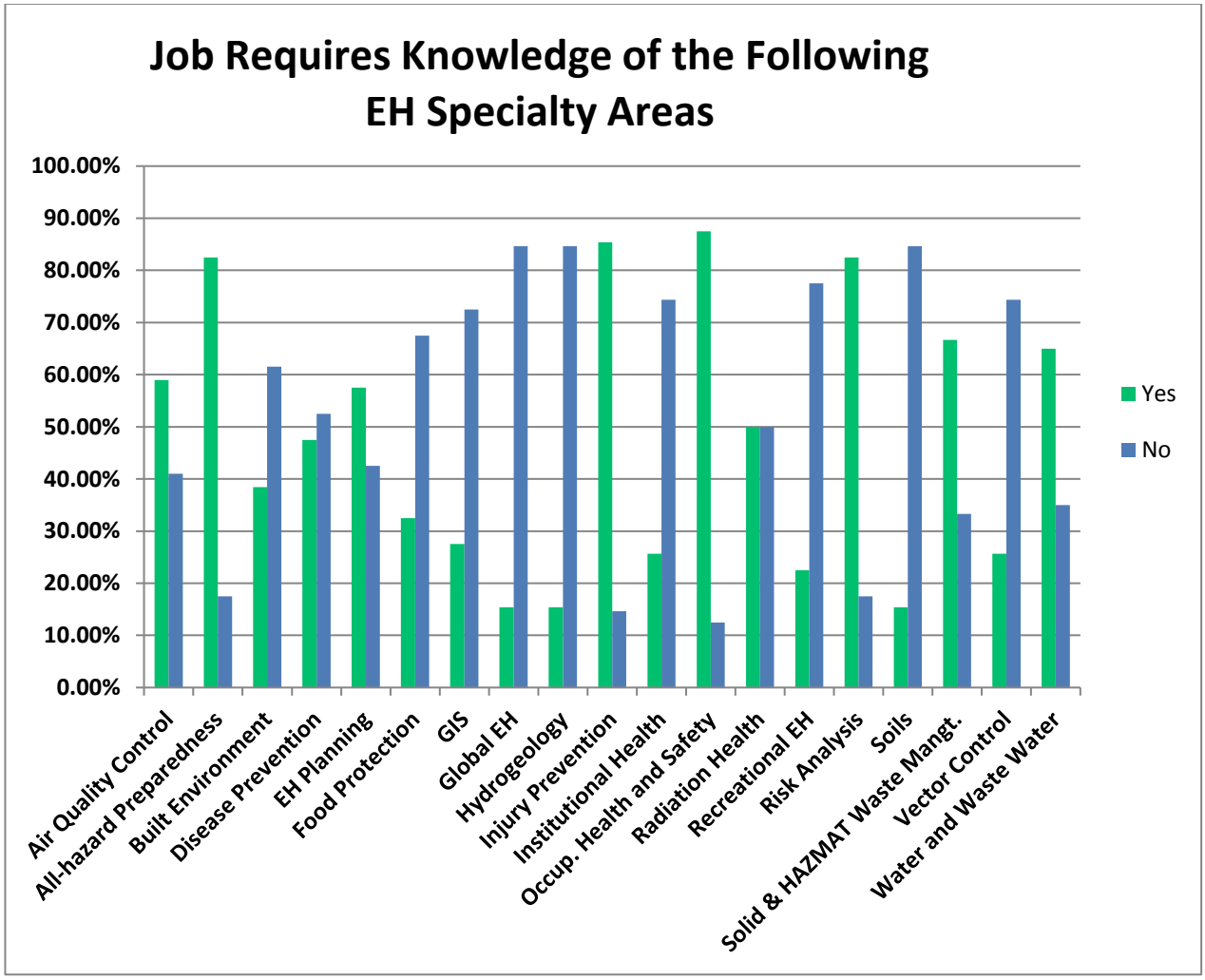
- Air Quality Control; All Hazard Preparedness;
- EH Planning; Injury Prevention;
- Occupation Health and Safety;
- Risk Analysis; Solid and HAZMAT Waste Management; and
- Water and Waste Water Treatment.

Knowledge was not required most among the following EH Specialty areas:

- GIS;
- Global Environmental Health;
- Hydrology;
- Institutional Health;
- Recreation Environmental Health;
- Soils; and

- Vector Control

**Chart 5.**




**Specialty Area Program Preparation**

Undergraduate respondents were asked to answer yes or no if they were well-prepared in the following specialty areas in their undergraduate program. Chart 6 presents the responses of 41 undergraduates, with more than 50% reporting they were well prepared for more than half of the specialty topics provided in the survey. Specialty areas scoring the highest in preparedness include:

- Air Quality Control;
- All-hazard Preparedness;
- Disease Prevention;
- Hydrogeology;
- Occupational Health and Safety;

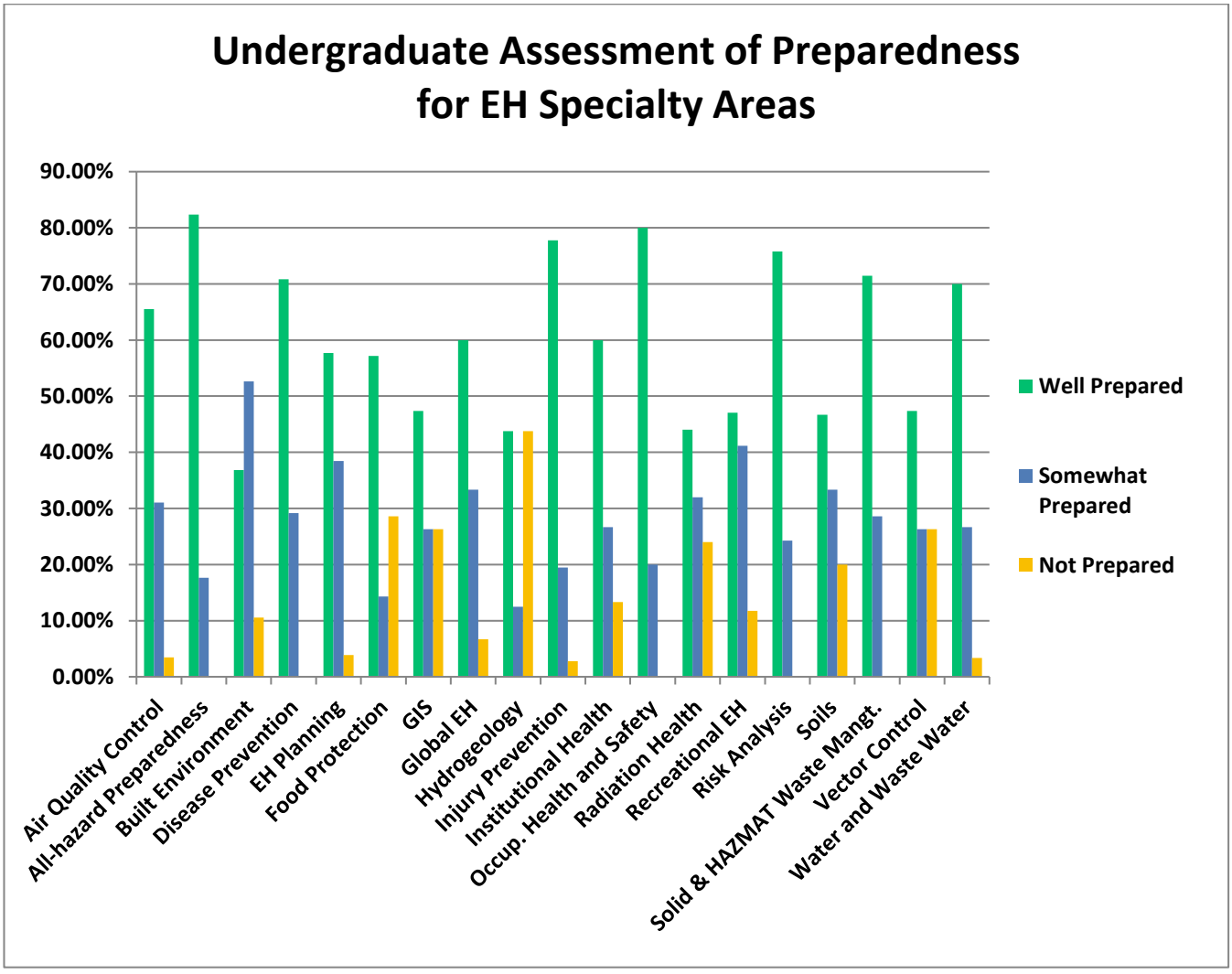
- Risk Analysis;
- Solid and HAZMAT Waste Management; and
- Water and Waste Water Treatment.

Specialty EH areas that undergraduates were least prepared for include:

- Hydrogeology;
- Food Protection;
- GIS;
- Radiation Health; and
- Vector Control.

These EH specialty areas mainly coincide with those knowledge reportedly not required by the employee's job.

**Chart 6.**



**Undergraduate Work Place Data:**

Chart 7 presents job sectors for undergraduates of the six schools surveyed. As previously mentioned, 41 of the 50 total respondents are currently employed in the Environmental Health field. More than 50 % of undergraduates are employed at private companies or corporations, as compared with just over 30% who work in government positions.

Chart 8 shows the distribution of those undergraduates who are employed by local, state or the federal government. The majority of respondents selected other government agency and did not specify their place of employment or chose "not applicable".

Chart 9 presents EH areas of employment for respondents. The majority of respondents have found employment within manufacturing.

The majority of Undergraduate employees reported making more than $70,000 per year as shown in Chart 10.

**Chart 7.**

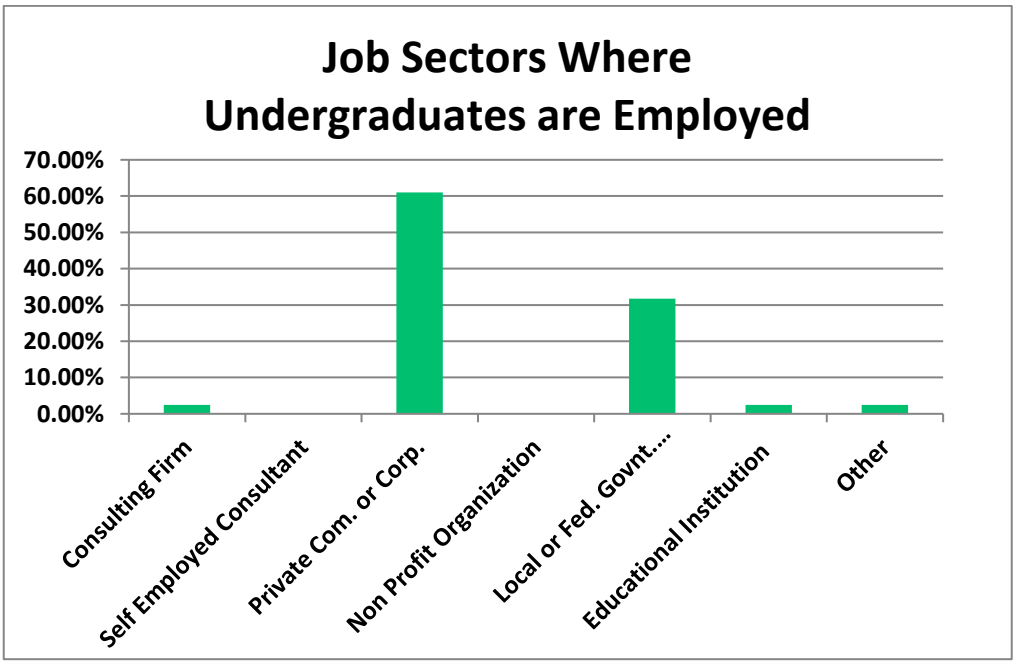
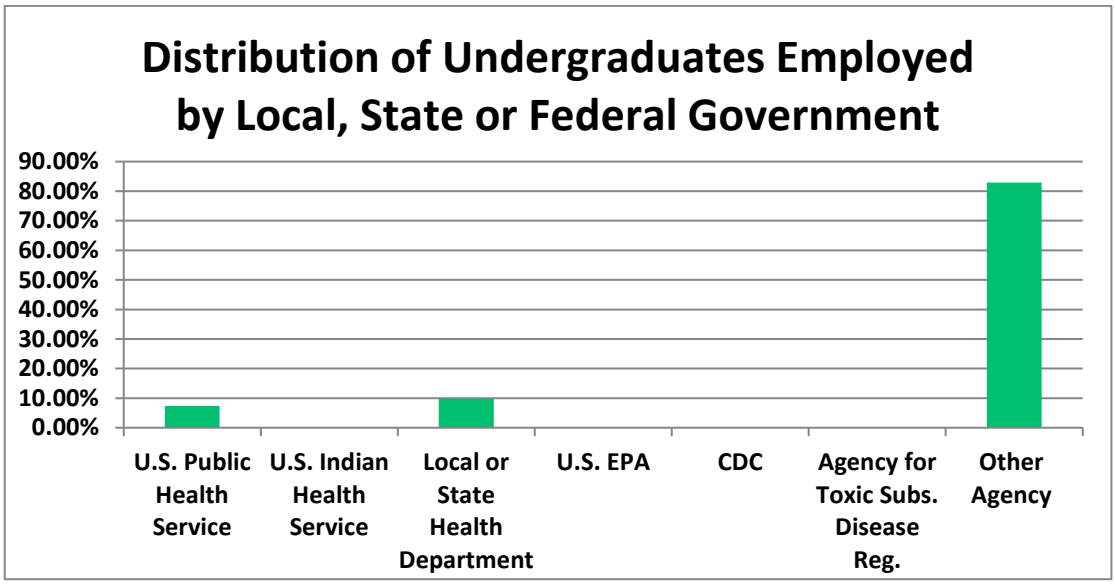
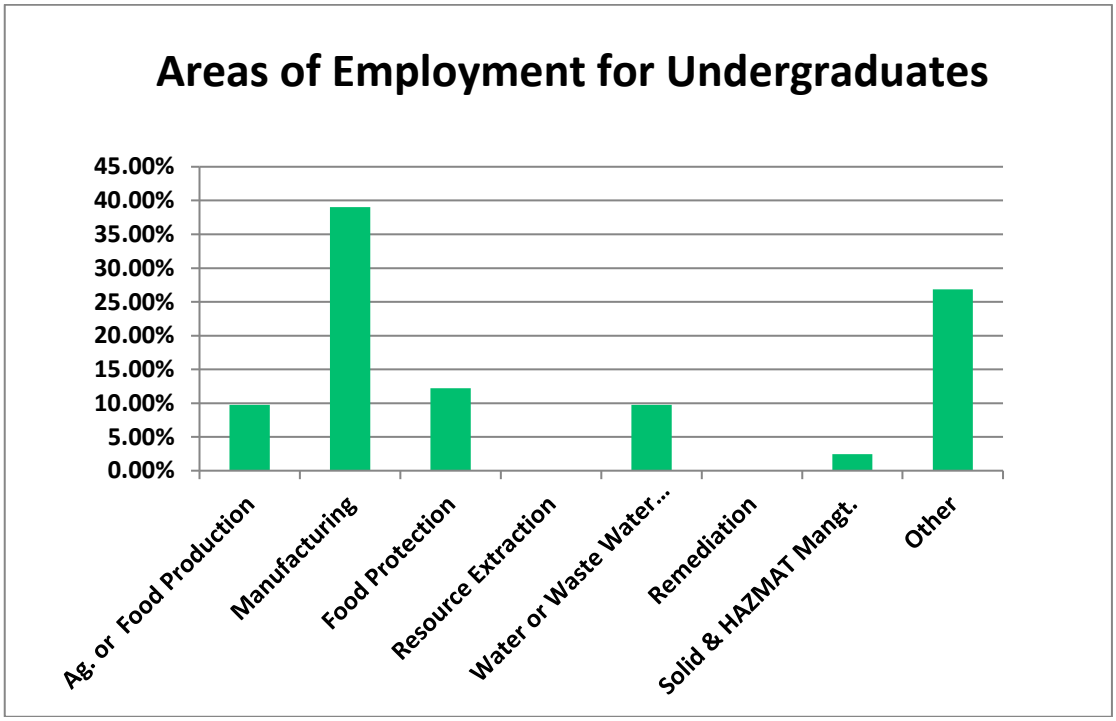


**Chart 8.**




Note: "Other" includes: U.S. Bureau of Reclamation or Not Applicable.

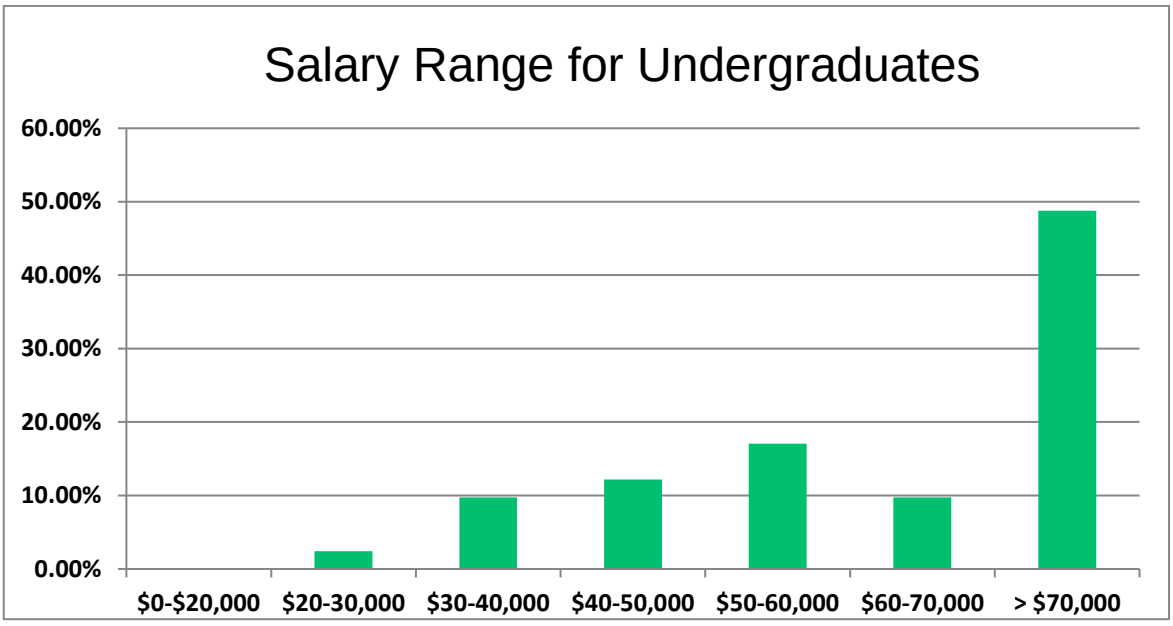
**Chart 9.**




Note: "Other" includes: safety, air pollution research, petroleum processing, Industrial hygiene/healthcare, oil and gas transportation and storage, pharmaceutical

manufacturing, smoke management, radiology, hydroelectric power and water.

**Chart 10.**




## Undergraduate Data on Continuing Education and Professional Development

Table 2. below details the types of degrees completed by undergraduates after earning a degree in Environmental Health:

**Table 2. Post Undergraduate Education**

| Number of Graduates that have Completed Post-Baccalaureate Degrees | Types of Degrees Awarded |
|---|---|
| 11 | MSPH, MS Environmental Science, Environmental and Occupational Exposure Science, Public Safety Leadership, MS Safety Management, MS Safety security and Emergency Management, MS Occupational Safety and Health, MS Environmental Health, MPH Disaster, MPH. |

## Professional Recognition

The following were listed as specific professional awards received by 12 respondents (Table 3.):

**Table 3. Awards Received**

| |
|---|
| Graduate of Safety Practitioner |
| GSP & CSP |
| USPHS – Commendation USPHS – Citation (2) USPHS – Presidential Unit Commendation USPHS – Unit Commendation (3) USPHS – Regular Corps Ribbon USPHS – Isolated Hardship Ribbon USPHS – Commissioned Corps Training Ribbon American Industrial Hygiene Association Sampling |

| |
|---|
| and Laboratory Analysis Committee Best Student Poster Psi Chapter, Delta Omega Honorary Society in Public Health Poster Presentation Award Phoenix Area IHS Environmental Health Officer of the Year Award |
| SW Idaho Laboratory Operator of the Year |
| CSP |
| Received the fall 2016 Northwest chapter AIHA scholarship, named February 2014 AEHAP student of the month |
| GSP |
| Member of Sigma Xi and Phi Kappa Phi |
| Nominated for NAFTA 2018 Rising Stars in Safety Award |
| 2017- USPHS Unit Commendation; 2016- NEHA Affiliate Certificate of Merit; "John C. Eason Award" (awarded by USPHS Environmental Health Officer Professional Advisory Category); USPHS Presidential Unit Citation; 2015- USPHS Citation; 2014- USPHS Unit Commendation; 2012- USPHS Achievement Medal; USPHS Unit Commendation; and Alaska Environmental Health Professional of the Year (awarded by Alaska Environmental Health Association); 2011- USPHS Citation; and USPHS Hazardous Duty Award |
| Graduate Safety Professional, Radiation Safety Officer |
| Received MD May 2016 and graduated AOA (top 10%), Two publications in addiction medicine, top medical student poster at 2015 GAFP annual meeting |

**Credentials Achieved:** The following were listed as specific certificate or credentialing exams passed by 17 respondents (Table 4):

**Table 4. Credentials Earned**

| |
|---|
| BCSP - Certified Safety Professional |
| Certified Safety Professional (CSP) |
| Certified Safety Professional, CSP |
| CHMM, CHSM |
| DOT Cert. |
| Global Health certificate |
| GSP |
| Idaho Laboratory Operator IV; Idaho Treatment Operator II |
| Land Use Training- Level I HAZWOPER; Certified Pool Operator |
| Licensed MD requiring passage of all 3 STEP exams |
| NEHA REHS/RS |
| OSHA #511 Class, Primary Operator Training for NCDEQ |
| Project Management Professional (PMP); Certified ScrumMaster (CSM) |
| Registered Environmental Health Specialist |
| REHS |
| REHS/RS |
| TDEC Erosion Control 1 |

## Professional Organizations

Twenty-seven undergraduate respondents indicated involvement in the professional organizations listed in Table 5. below:

**Table 5. Professional Organizations**

| |
|---|
| ASSE |
| AIHA |
| Alaska Environmental Health Association - member |
| ASDSO |
| ASSE - Responsible Ag - Technical Committee Member |
| American Society of Safety Engineers-VP of local chapter and government affairs of region |
| AWWA |
| BCSH |
| Commissioned Officers Association of the USPHS (COA) |
| Food Safety Advisory Committee (Wake County, NC); Food Safety Task Force (Wake Country, NC) |
| GEHA |
| IHMM |
| National Safety Council |
| NEHA |
| NSC Young Professionals-member |
| PNCWA |
| Special STAR Team Member (SSTM) - NC Department of Labor. |
| USPHS, EHOPAC Awards Subcommittee |

# Supervisor Survey Results

Supervisors of undergraduates from re-accrediting programs were asked to assess the skill and preparedness of their employees. Thirteen supervisors responded to the survey and their responses are presented below along with information related to their job sector and primary areas of work. Charts 11 and 12 present data related to the area of supervisor employment. There is almost an even split between supervisors working for government agencies and those working I the private sector (Chart 11). Similarly, to the undergraduate respondents, the majority of supervisors work in EH sectors related to manufacturing operations.

**Chart 11.**

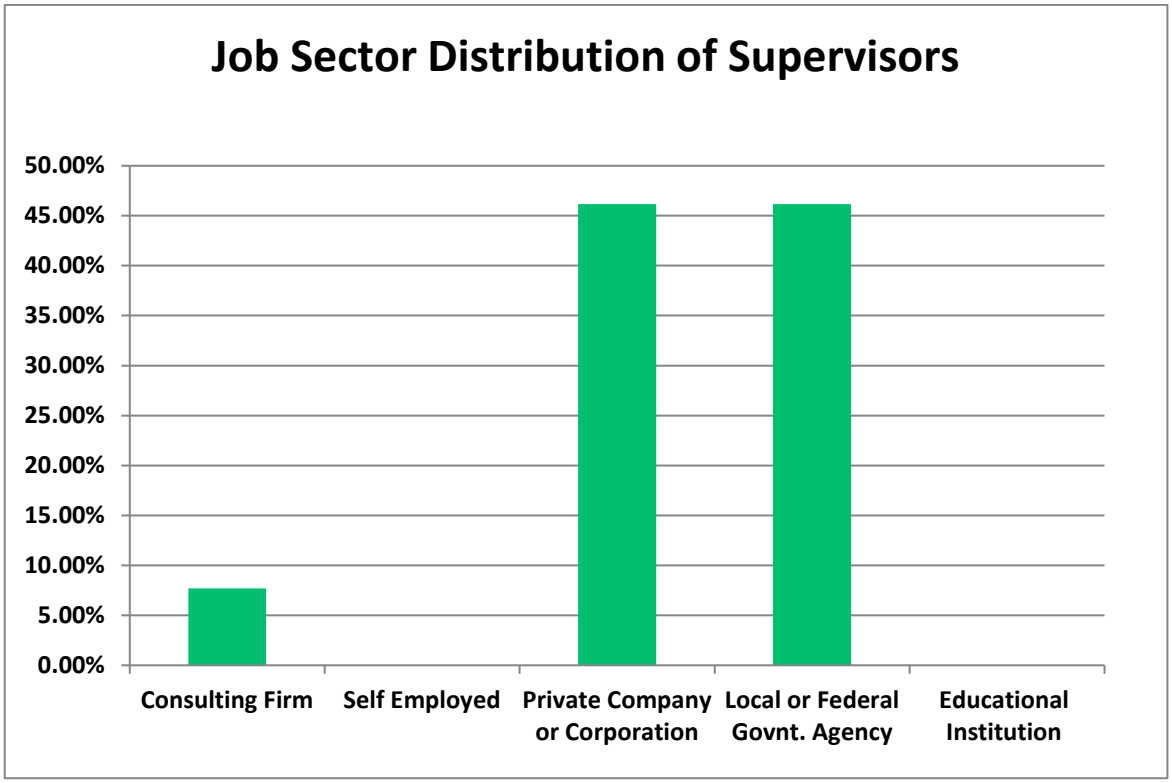
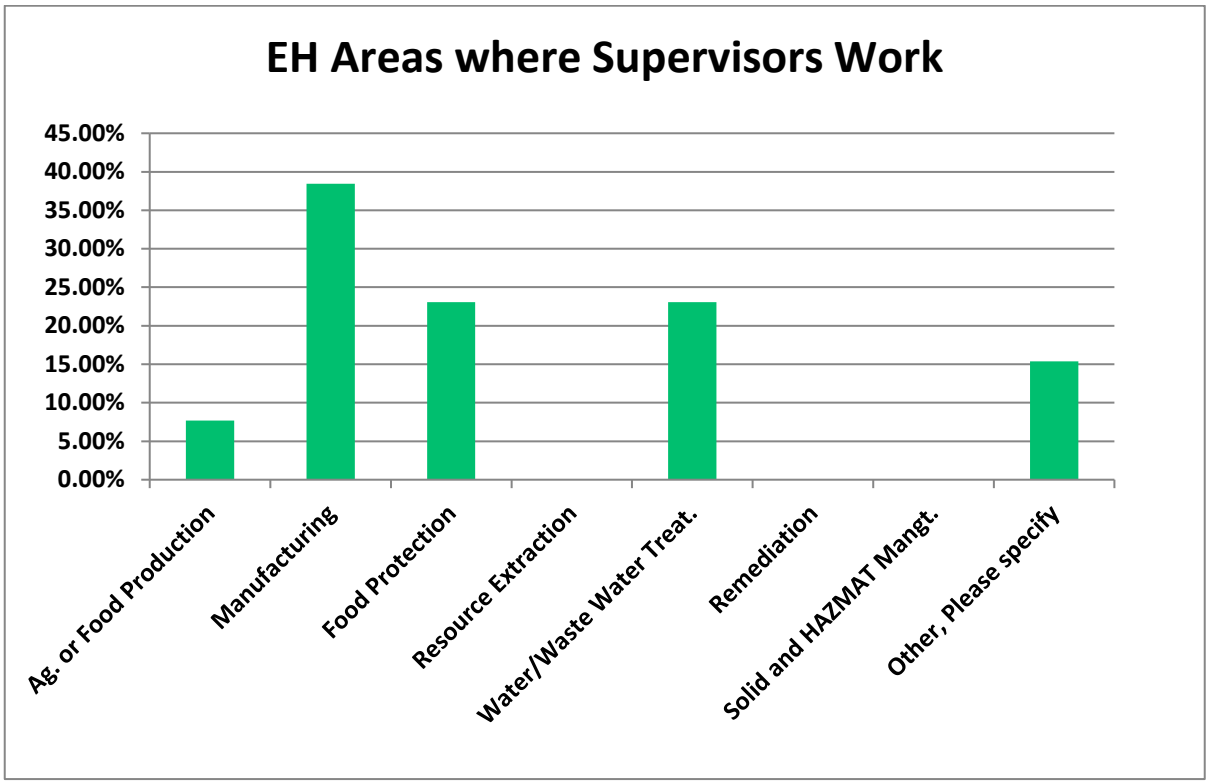


**Chart 12.**




Note: "Other" includes Regulatory Programs and Grocery/Retail.

## Supervisor Rating of Undergraduate Skills

Thirteen supervisors responded to questions regarding the skill levels of undergraduates. All supervisors responded with job sector and primary work area information. Charts 13-16 present the supervisor estimates of employee acumen related to job skills, interpersonal skills, skills related to interpreting data, as well as employee proficiency in EH specialty areas.

Supervisors reported high proficiency levels related to IT/Computer skills, public speaking and technical writing, although public speaking and writing skills showed less proficiency overall (Chart 13).

Interpersonal skills and Skills related to interpreting and reporting data were rated proficient or higher by supervisors (Charts 14 and 15).

Risk assessment, communication and management skills were also highly rated by supervisors while employee's understanding of toxicology and epidemiology had lower proficiency ratings (Chart 16). However, a majority of respondents cited toxicology and epidemiology as *not* applicable to their employee's position.

**Chart 13.**

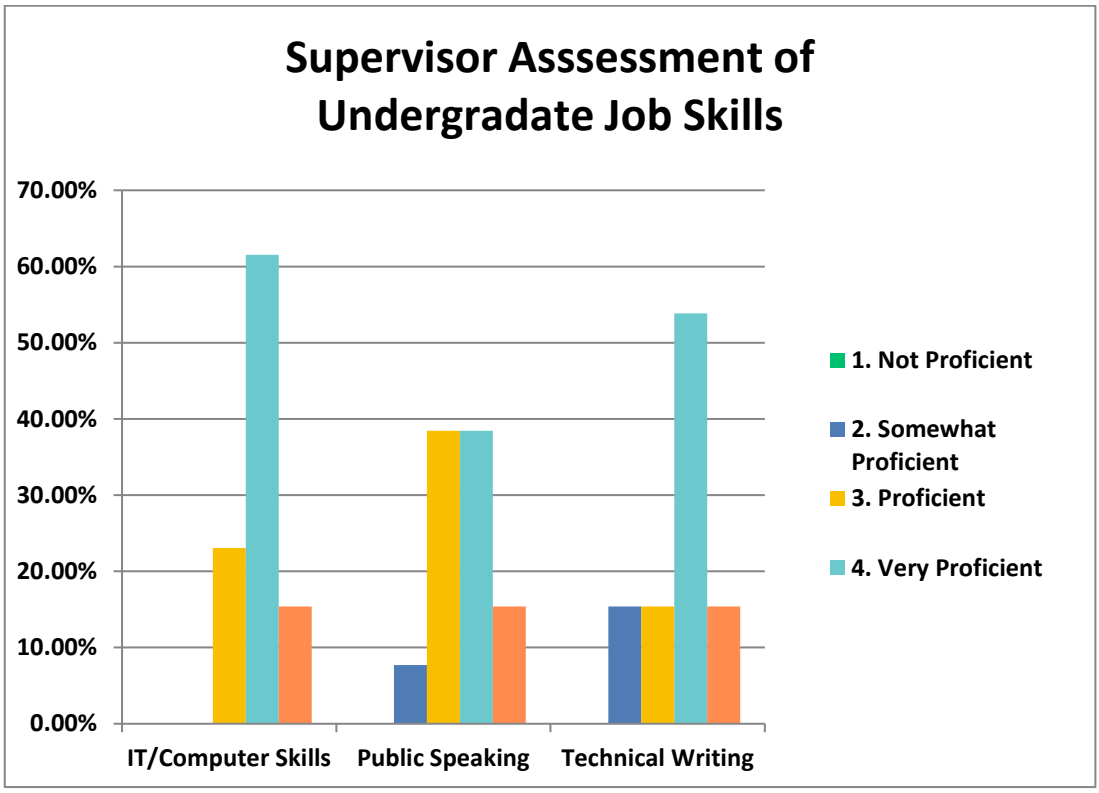



**Chart 14.**

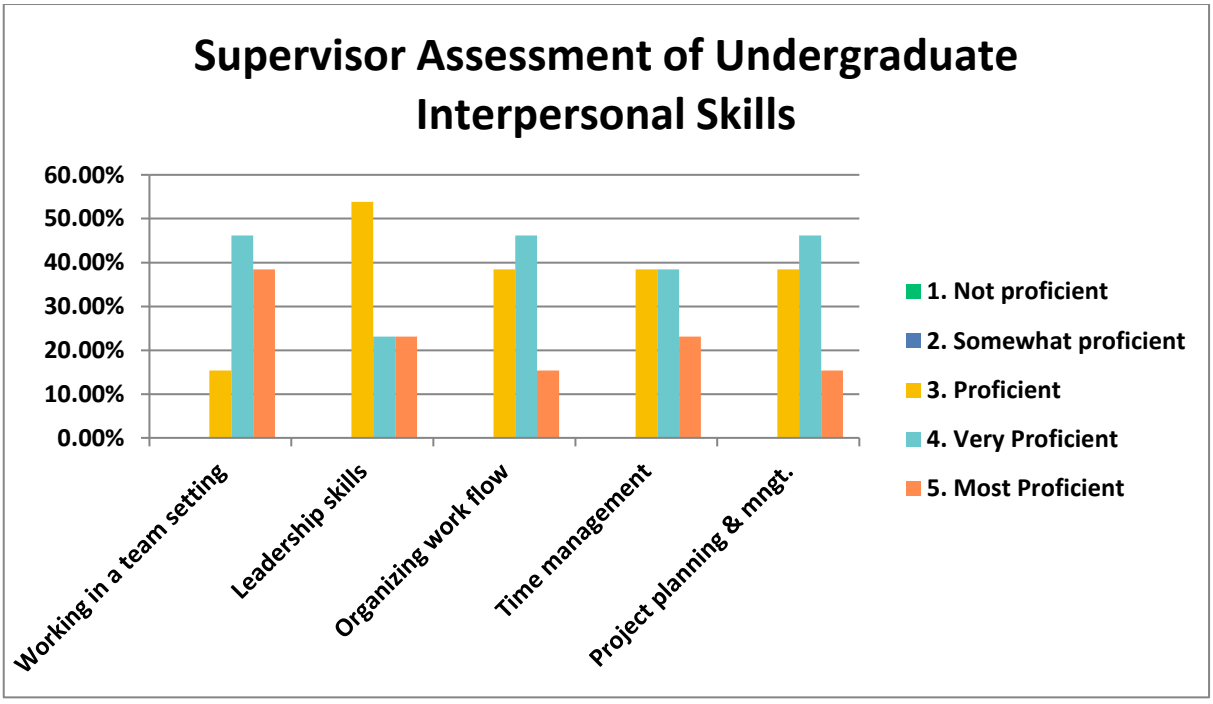


**Chart 15.**

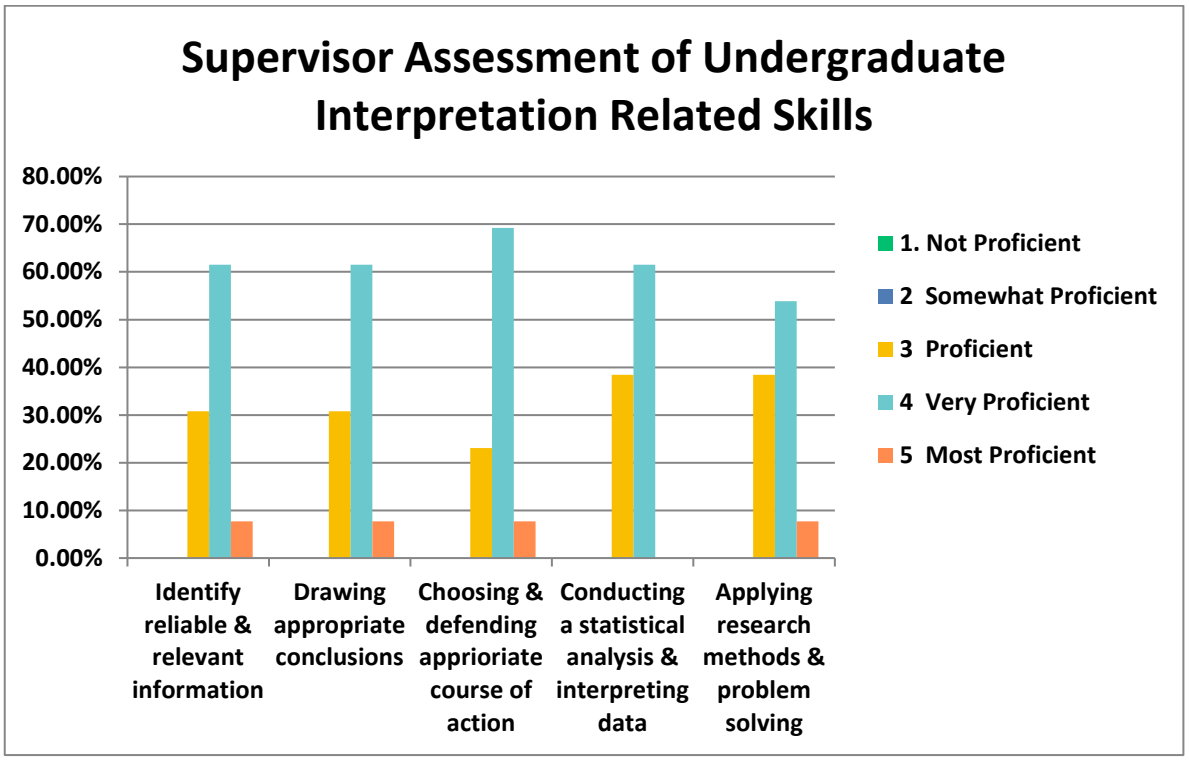
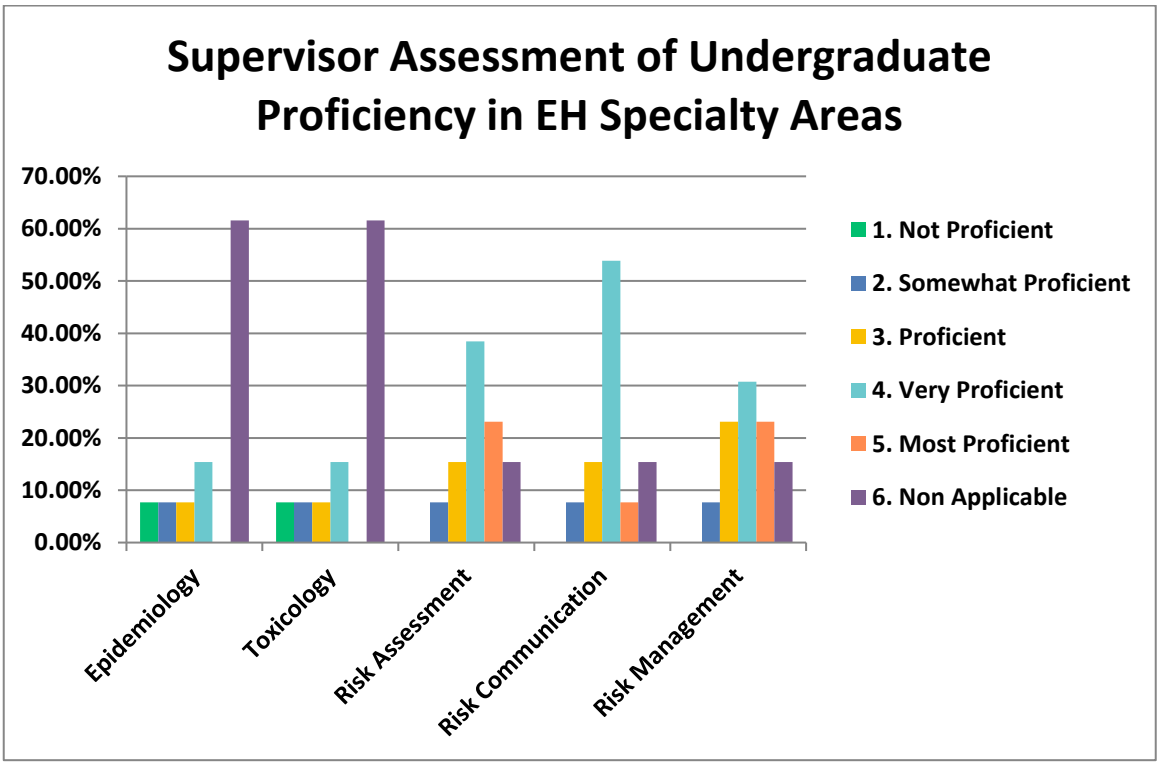


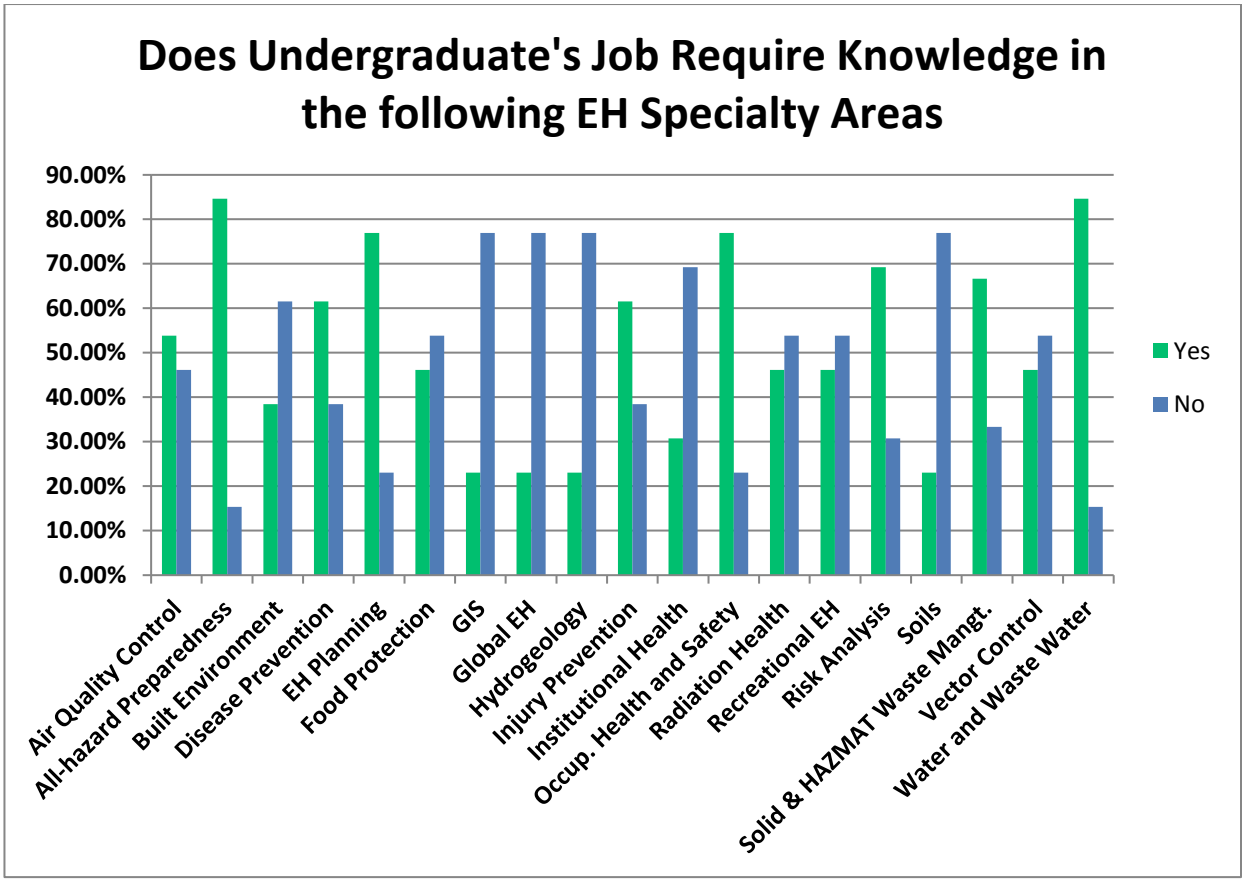

**Chart 16.**



## 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 Chart below represents the responses of 13 Supervisors:

**Chart 17.**




## Program Preparation

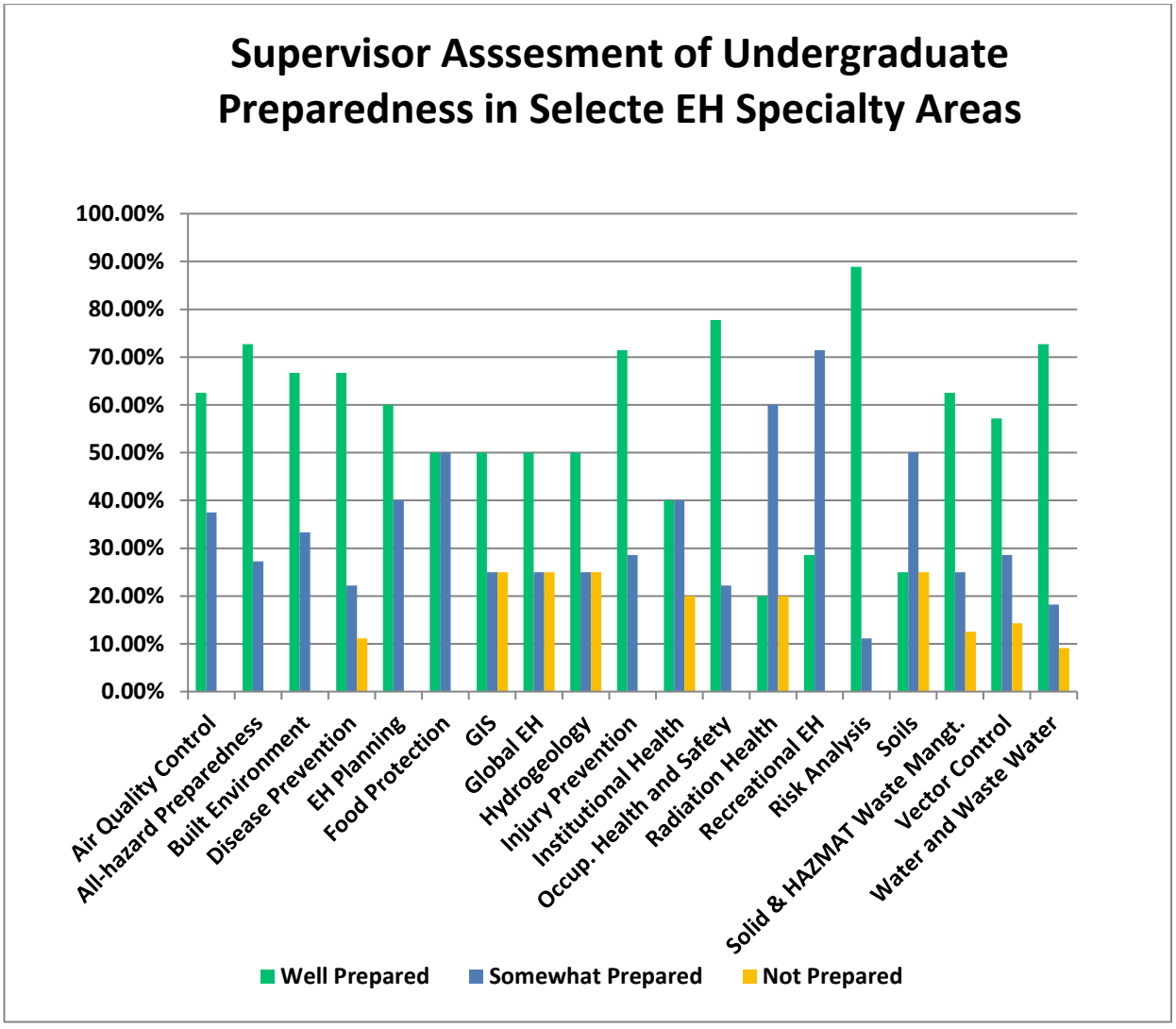
Supervisors of undergraduates were asked to answer yes or no if undergraduates were well-prepared in the following specialty areas. Chart 18, below, represents the responses of 13 supervisors. EH specialty areas scoring the highest in preparedness include:

- Risk Analysis;
- Occupational Health and Safety;
- All Hazard Prepardness;
- Injury Prevention;
- Water and Waste Water.

Specialty EH areas that undergraduates were least prepared for according to supervisors include:

- Soils;
- GIS;
- Global Environmental Health; and
- Hydrogeology.

**Chart 18.**



**Additional Specialty Areas Knowledge Needed**

Five of 13 Supervisor respondents indicated the following specific "other" specialty areas necessary for their jobs.

**Table 6. "Other" Necessary Specialty Areas**

| |
|---|
| Water Law-irrigation, groundwater, NPDES |
| Analytical laboratory techniques |
| Pool chemistry and hydraulics. |
| Understanding of environmental operating permits and regulatory inspection preparation |
| Industrial Hygiene assessment and control |

## Narrative and Discussion

EHAC accredits environmental health academic programs in order to create a cadre of educational institutions that produce environmental health undergraduates who 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 undergraduate assessments regarding preparedness shows undergraduates are graduating with an overall favorable preparedness level for their current jobs (Charts 19 and 20). The majority of all supervisor ratings of employee preparedness fell within the somewhat to well-prepared categories, with similar self-ratings by former students. Highest levels of preparedness were reported by both undergraduates and supervisors for the following specialty areas:

- Air Quality Control;
- EH Planning; and
- Food Protection

The more challenging areas of preparedness according to both supervisors and employees included:

- Institutional Health;
- Radiation Health;
- Recreation EH;
- Soils;
- and Vector Control.

**Chart 19.**

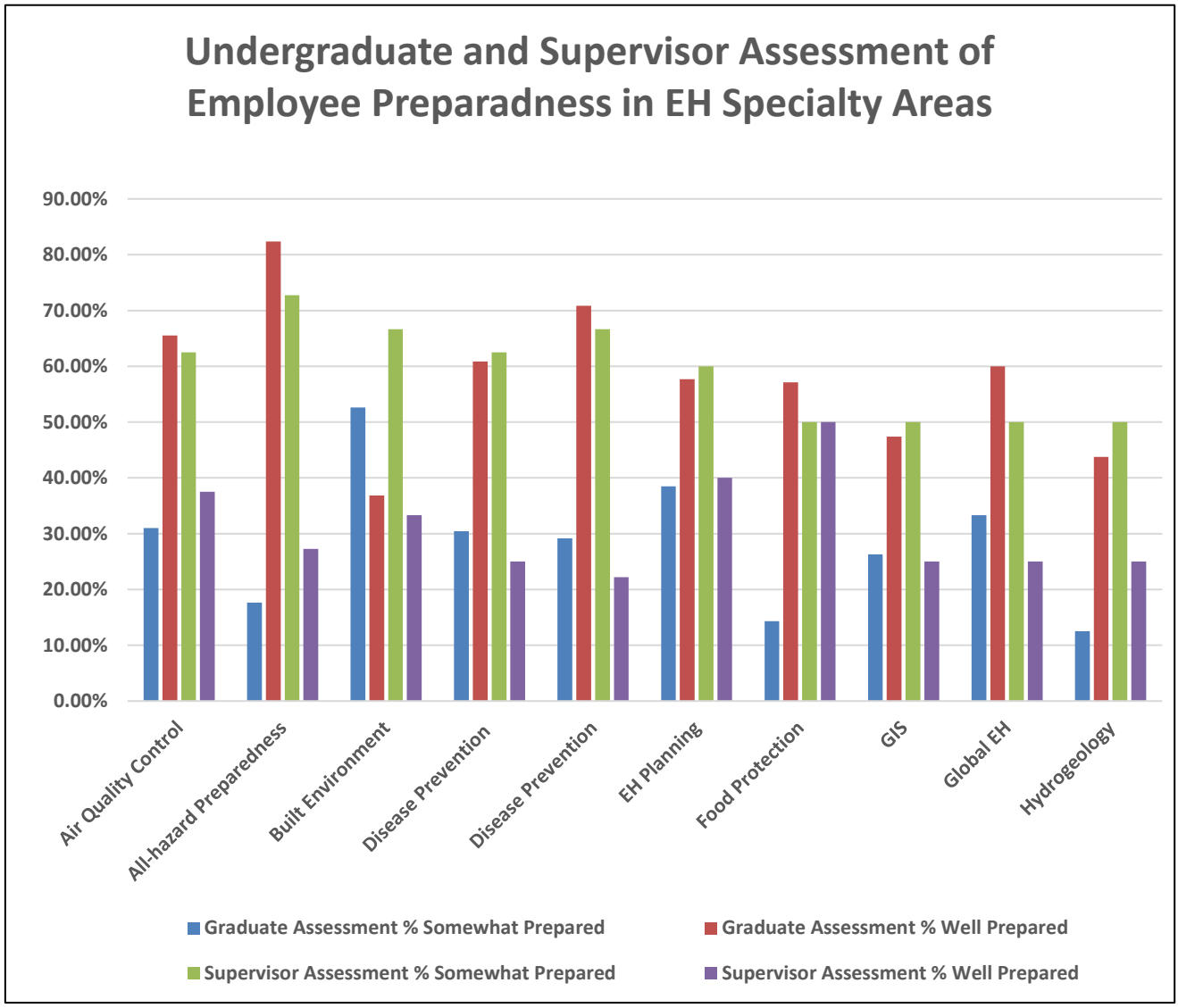

Undergraduate and Supervisor Assessment of Employee Preparadness in EH Specialty Areas
90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Air Quality Control
All-hazard Preparedness
Built Environment
Disease Prevention
Disease Prevention
EH Planning
Food Protection
GIS
Global EH
Hydrogeology
Graduate Assessment % Somewhat Prepared
Graduate Assessment % Well Prepared
Supervisor Assessment % Somewhat Prepared
Supervisor Assessment % Well Prepared

**Chart 20.**

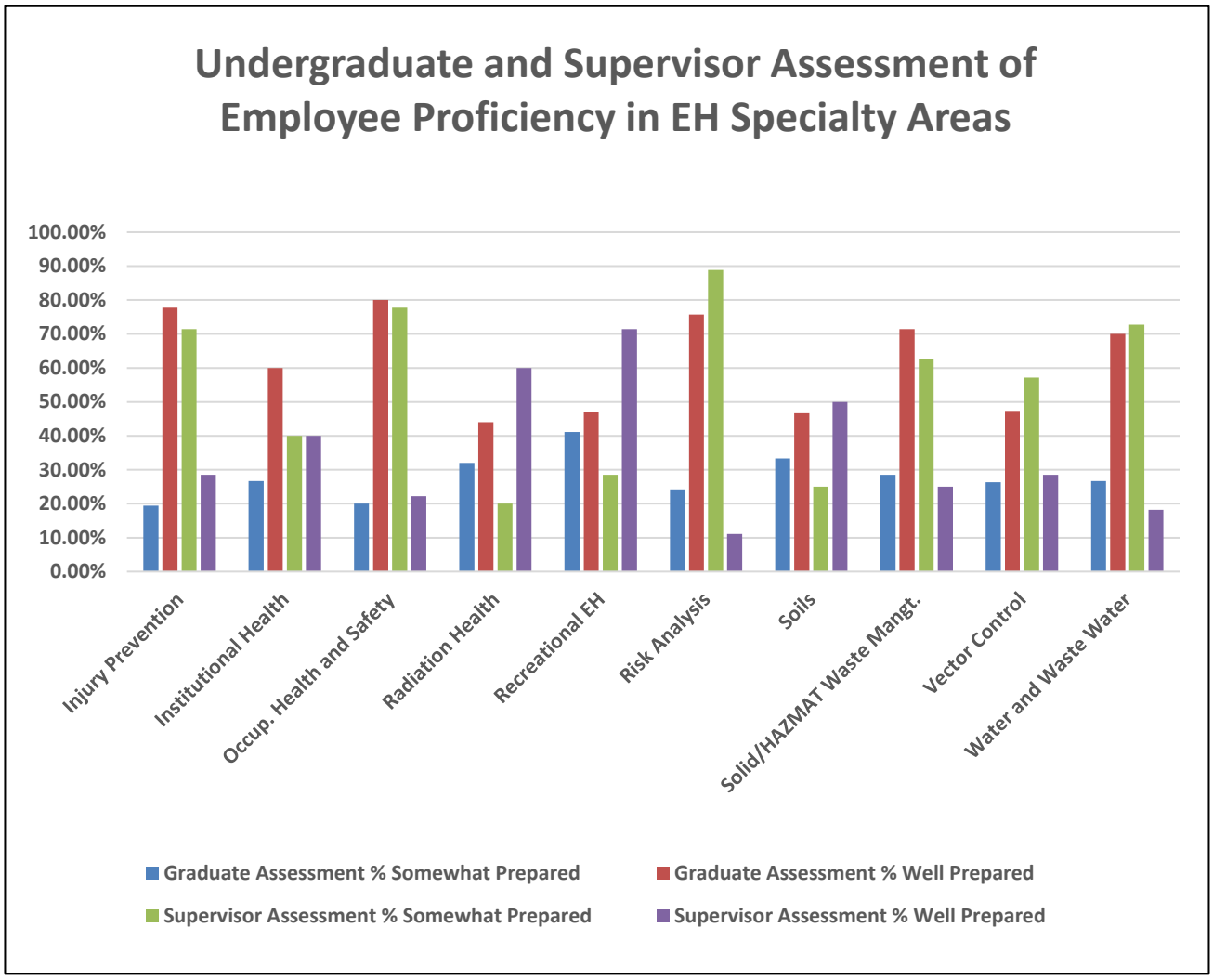


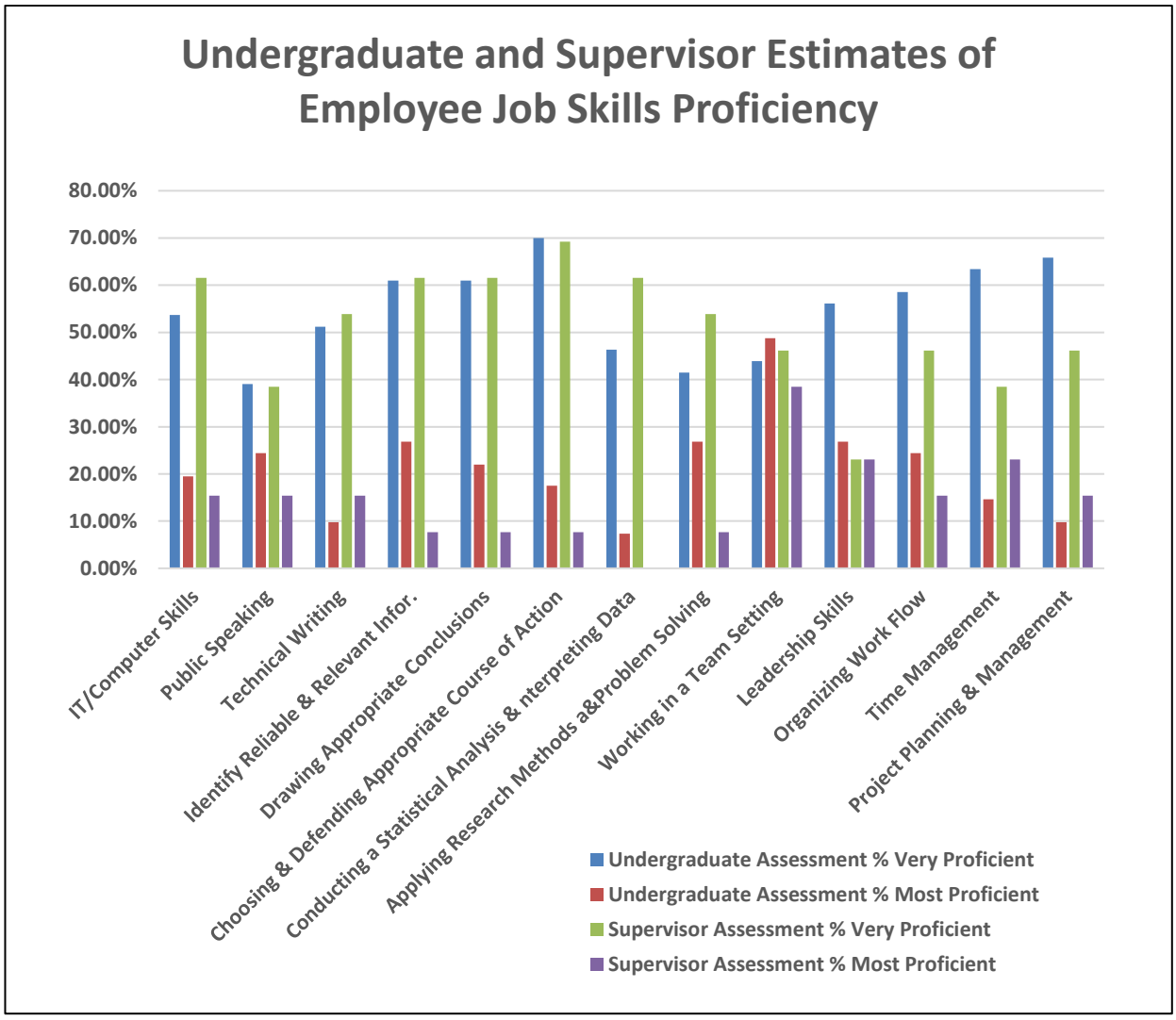

Chart 21 shows a similar satisfaction level of both undergraduates and supervisors regarding undergraduate skill levels in 18 different job skills areas. Again, the majority of undergraduate and supervisors rated job skills at very or most proficient. Supervisors and employees agreed that preparedness levels were high for:

- Information Technology/Computer Skills;
- Identifying Reliable and Relevant Information;
- Drawing Appropriate Conclusions;
- Time Management; and
- Project Planning and Management.

Job skills needing more preparation include:

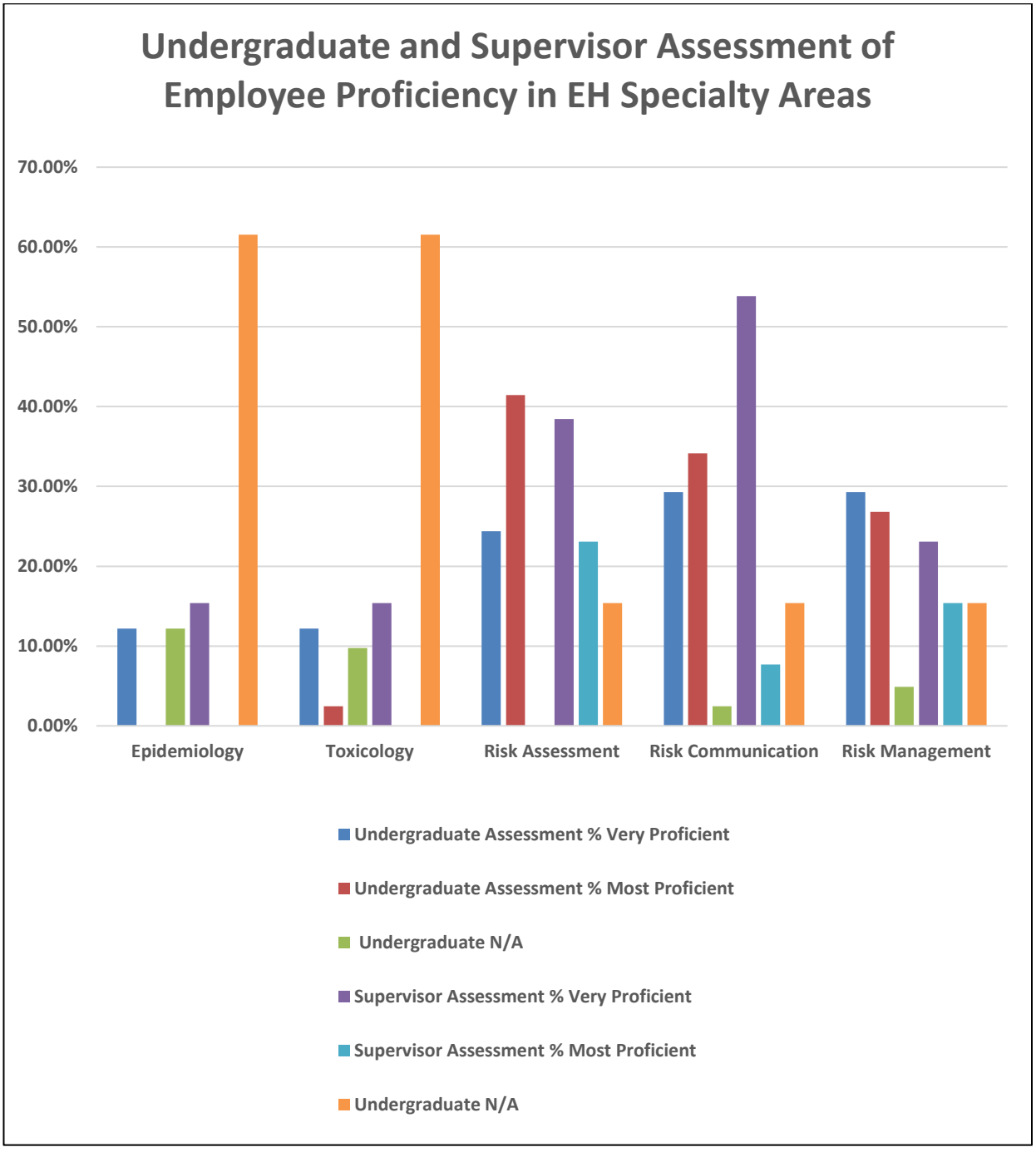
- Public Speaking;
- Leadership Skills;
- Technical Writing: and
- Organizing Work Flow.

**Chart 21.**




Lastly, undergraduate and supervisor ratings of employee proficiency levels in EH specialty areas found similarities, as well. While Epidemiology and Toxicology were not applicable to more than 60% of supervisors, those citing relevancy gave favorable ratings to their employees (Chart 22). Risk Assessment, communication and management also received high ratings from both supervisors and employees.

**Chart 22.**


Undergraduate and Supervisor Assessment of Employee Proficiency in EH Specialty Areas
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Epidemiology
Toxicology
Risk Assessment
Risk Communication
Risk Management
Undergraduate Assessment % Very Proficient
Undergraduate Assessment % Most Proficient
Undergraduate N/A
Supervisor Assessment % Very Proficient
Supervisor Assessment % Most Proficient
Undergraduate N/A