OUTSTANDING STUDENT SECTION of the YEAR AWARD
Co-sponsored by American Society of Safety Engineers
and Mine Safety Appliances Company
2011

WESTERN CAROLINA UNIVERSITY
STUDENT SECTION
**Annual Minimum Criteria**

<table>
<thead>
<tr>
<th>Check-off</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Student Section (Section) publishes a newsletter at least 4 times during the academic year.</td>
</tr>
<tr>
<td>X</td>
<td>Section sends at least one representative to a minimum of two parent-chapter General Membership or Executive Committee meetings per year.</td>
</tr>
<tr>
<td>X</td>
<td>Section conducts at least 6 meetings per year, with 4 being of technical content. The definition of “technical” in this context is that the process or procedure directly relates to SHE practice.</td>
</tr>
<tr>
<td>X</td>
<td>Section Bylaws are reviewed annually and revised and re-approved within the last 2 years.</td>
</tr>
<tr>
<td>X</td>
<td>Section works with and cooperates with the Faculty Advisor on all matters.</td>
</tr>
</tbody>
</table>

**Outstanding Student Section Application**

Application Date (No later than April 1, 2011): 04/01/2011

Activity Dates: **September 2010 through March 2011**

Student Section Name: Western Carolina University Student Chapter

Parent Chapter: Piedmont Chapter

Faculty Advisor: Dr. Tracy Zontek

Number of Students Pursuing an Academic Degree in Safety or related discipline: 65

Number of Section Members: 27

Names and Titles of Student Section Officers and Leaders

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christopher Caler</td>
<td>President</td>
</tr>
<tr>
<td>Layne Arnold</td>
<td>President Elect</td>
</tr>
<tr>
<td>Nick Hammond</td>
<td>Secretary</td>
</tr>
<tr>
<td>Drew Craig</td>
<td>Treasurer</td>
</tr>
<tr>
<td>Levi Mines</td>
<td>Chair for the Outstanding Student Section of the Year Award</td>
</tr>
<tr>
<td>James Fincannon</td>
<td>Chair for Website Development</td>
</tr>
</tbody>
</table>
Outstanding Student Section Award

Application Contact Page

We attest that the information provided in this application is a true representation of the Student Section activities for the period specified.

[Signature]
Signature – Student Section President

[Signature]
Signature – Faculty Advisor

Student Section Address: Phone Number:
School of Health Sciences (828) 227-2146
106A Moore Hall
Western Carolina University
Cullowhee, NC 28723

Please email a PDF version of your COMPLETE application and supporting data to chapterservices@asse.org. Only electronic submissions will be accepted.
1.0 Professional Development

Section meetings devoted to furthering safety education, research and professionalism. Additional information can be found in newsletters, Appendix B.

<table>
<thead>
<tr>
<th>Meeting Date</th>
<th>Topic</th>
<th>Speaker</th>
<th># of Section Members in Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01/10</td>
<td>Semester Kick-off Meeting, Bylaw review</td>
<td>ASSE student officers</td>
<td>12</td>
</tr>
<tr>
<td>09/04/10 ASSE Piedmont Section Parent Chapter Social (Greenville, SC)</td>
<td>Networking and social</td>
<td>Greenville Drive Minor League baseball team</td>
<td>10</td>
</tr>
<tr>
<td>09/22/2010</td>
<td>*Radionuclides in Water</td>
<td>Catherine Rosfjord NC Dept. of Environment and Natural Resources</td>
<td>7</td>
</tr>
<tr>
<td>10/11/2010</td>
<td>*Hearing Protective Devices</td>
<td>Sally Crabtree 3M Corp.</td>
<td>14</td>
</tr>
<tr>
<td>10/21/2010 ASSE Piedmont Section Parent Chapter Meeting</td>
<td>*OSHA Emergency Action Plans</td>
<td>DJ Neuberger Spartanburg Regional Medical Center</td>
<td>25</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Organizer</td>
<td>Duration</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>12/02/2010</td>
<td>*Health and Safety in R&amp;D</td>
<td>Dr. Joe Pickel Oak Ridge National Laboratory</td>
<td>18</td>
</tr>
<tr>
<td>01/31/2011</td>
<td>Semester Kick-off Meeting</td>
<td>ASSE student officers</td>
<td>15</td>
</tr>
<tr>
<td>02/22/2011</td>
<td>Advising Day – Getting the most from your classes, internship, and extracurricular activities</td>
<td>ASSE Officers and other student presenters</td>
<td>28</td>
</tr>
<tr>
<td>03/17/2011</td>
<td>ASSE Piedmont Section Parent Chapter Meeting (Fountain Inn, SC)</td>
<td>*Piedmont Section Professional Development Conference</td>
<td>Various speakers and topics, tour of Grainger distribution facility</td>
</tr>
<tr>
<td>03/22/2011</td>
<td>*Environmental Health Research Symposium</td>
<td>Student Researchers</td>
<td>10</td>
</tr>
<tr>
<td>04/04/2011</td>
<td>Chapter meeting, new officer introductions</td>
<td>ASSE Officers</td>
<td>X</td>
</tr>
<tr>
<td>04/29/2011</td>
<td>End of semester party and recruiting event</td>
<td>ASSE members and others interested in joining</td>
<td>X</td>
</tr>
</tbody>
</table>

*Denotes a technical meeting

### 2.0 Section-Sponsored Research:

A list of research is presented here; more detailed information is provided in Appendix B.

#### 2.1 The use of RFID to Improve the Effectiveness, Efficiency and Safety of Chemical Inventories at the Center for Nanophase Materials Sciences ~ Drew Craig

- Overall Winner at ASSE Region VI Professional Development Conference, 2010
- Presented at ASSE Piedmont Section PDC, 2011

#### 2.2 Using the Condensation Particle Counter to Evaluate Cleanroom Particle Counts during High and Low Occupancy and Developing Contour Maps to Characterize Cleanroom Control Technology ~ Samantha Connell

- Will be presented at national ASSE conference, 2011
- Poster Winner at ASSE Region VI Professional Development Conference, 2010
2.3 Identifying Deficiencies in Construction Safety Injury/Illness Reporting ~ Layne Arnold
   - Presented at ASSE Region VI Professional Development Conference, 2010
   - Presented at ASSE Piedmont Section PDC, 2011

2.4 Exploring Sustainability in Health and Safety ~ Nick Hammond
   - Presented at ASSE Region VI Professional Development Conference, 2010
   - Presented at ASSE Piedmont Section PDC, 2011

2.5 Assessing Safety and Environmental Health Measures in Elderly Homes in Angoon, AK ~ Stephanie James
   - Presented at ASSE Piedmont Section PDC, 2011

2.6 Complete Hazard Assessment within a Gross Anatomy Laboratory ~ Christopher Caler
   - Presented at ASSE Piedmont Section PDC, 2011

2.7 Comparison of Chainsaw Noise Emissions ~ Amanda McQueen
   - Presented at National Conference on Undergraduate Research, 2011

2.8 Use of Gravimetric Analysis to Determine if Ozone Can Improve Air Quality in an Unoccupied Location ~ Amanda McQueen
   - Presented at National Conference on Undergraduate Research, 2011

3.0 Community and Professional Enhancement:

Additional information found in newsletters, Appendix B.

Section-sponsored community activities:

3.1 Water Quality Monitoring
ASSE members Stephanie Caler and Kelly Nicewonger coordinated a community service water quality project to investigate fecal coliform contamination of Savannah Creek. In conjunction with a non-profit association and the local health department sources of contamination were identified for intervention.

3.2 Cullowhee Valley School Supply Drive (CVSSD)
ASSE members collected school supplies for local children who do not have basic provisions to succeed.

Section participation in other community activities:

3.3 Tuck River Clean Up
ASSE members will assist in cleaning 27 miles of river, removing about 3 tons of
garbage using a whitewater raft to paddle down the Tuck and collect trash.

3.4 **Project Fuel Intervention for the Rural Elderly (FIRE)**
ASSE members donned leather gloves, ear muffs and safety glasses to chop donated timbers into usable firewood to be used by low-income elderly whose only source of heat and cooking fuel is wood.

3.5 **Etiquette Dinner**
ASSE members attended WCU’s Etiquette Dinner. At the formal five course dinner, students learned about place settings, how to make appropriate dinner conversation, network, and navigate an interview during a meal.

**Section-sponsored campus activities:**

3.5 **ASSE Members Teaching Others Colorimetric Detector Tubes (CDT)**
ASSE students taught other students to use CDT to analyze air for potentially dangerous chemicals. By teaching others about CDTs and air quality, both ASSE members and students came away with a better understanding of air sampling methods and generated interest careers in health and safety.

4.0 **Recognition:**
Additional information is found in newsletters, [Appendix B](#).

4.1 Three students, Samantha Connell, Mikayla Deardorff, and Maika Lee were each awarded a $1000 scholarship at the Annual ASSE Piedmont Professional Development Conference.

4.2 Amanda McQueen was selected to present two research projects at the National Conference for Undergraduate Research in Ithaca, NC.

4.3 Samantha Connell was selected to present her research at the national ASSE PDC in Chicago.

4.4 Amanda McQueen was selected to present during a NC legislative session to increase support for undergraduate research in state universities.

4.4 Six students were selected to present research at the ASSE Region VI PDC. Drew Craig took first place overall and Samantha Connell won the poster presentation.

4.5 Stephanie James Caler won the ASSE sponsored SiteHawk Safety Scholarship, $1000.

5.0 **Student Section Participation:**

5.1 There are 65 environmental health majors at WCU. Currently, 41.5% (n=27) are members of the ASSE section with 3.7% of members are freshman, 37% of members are sophomores, 29.6% of members are juniors, and 29.6% of members are seniors.
5.2 Percentage of student ASSE members at each meeting.

<table>
<thead>
<tr>
<th>Meeting Date (mm/dd/yyyy)</th>
<th>Percent of ASSE Members in attendance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01/2010</td>
<td>43</td>
</tr>
<tr>
<td>09/04/2010</td>
<td>36</td>
</tr>
<tr>
<td>09/22/2010</td>
<td>25</td>
</tr>
<tr>
<td>10/11/2010</td>
<td>50</td>
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<tr>
<td>10/21/2010</td>
<td>89</td>
</tr>
<tr>
<td>12/02/2010</td>
<td>64</td>
</tr>
<tr>
<td>01/31/2011</td>
<td>53</td>
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<tr>
<td>02/22/2011</td>
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<tr>
<td>03/17/2011</td>
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<tr>
<td>03/22/2011</td>
<td>38</td>
</tr>
<tr>
<td>04/04/2011</td>
<td>TBD</td>
</tr>
<tr>
<td>04/27/2011</td>
<td>TBD</td>
</tr>
<tr>
<td>04/29/2011</td>
<td>TBD</td>
</tr>
</tbody>
</table>

5.3 Roster List for 2010 – 2011

1. Layne Arnold
2. James Bailey
3. Kristina Bartlett
4. Kirby Blackwelder
5. Lauren Butner
6. Christopher Caler
7. Justin Clayton
8. Ann Coxe
9. Drew Craig
10. Tyler Cummings
11. Mikayla Deardorff
12. James Fincannon
13. Heather Foster
14. Ricky Greene
15. Nick Hammond
16. Stephanie James
17. Maika Lee
18. Amanda McQueen
19. Ryan Michaud
20. Katherine Mills
21. Levi Mines
22. Kelly Nicewonger
23. Emily Patton
6.0 Endorsements

Letters are found in Appendix A.

David Day, ASSE Piedmont Student Liaison
Kurt Rayburg, ASSE Piedmont President
James Miller, ASSE Region VI r
Vincent R. Miller, ASSE Region VI Vice President
Burt Ogle, ENVH Program Director
Tracy Zontek, Student Section Advisor

7.0 Support Documentation

Support documentation has been provided with this application. Included documents can be found in Appendix B.

- A summary of the chapter’s yearly goals and objectives
- A summary of the chapter’s long-term goals and objectives
- A one page summary of WCU’s health and safety program
- A history of WCU’s ASSE student chapter
- Four newsletters
- Agenda from ASSE Advising Day Event
- Examples of student research projects

8.0 Other

The WCU ASSE student chapter has grown in leaps and bounds in the past year since our inception. We would like to formally acknowledge our parent chapter, the Piedmont section, and Region VI for their generous and vast support of our chapter. Despite the fact that the Piedmont section is two and a half hours away, officers and members have made constant efforts to be available to students for mock interviews, job and internship advice, questions regarding professional practice, service as guest speakers, donation of used equipment, networking, and simple friendship. We are proud to be part of this dynamic and engaged organization. Thank you.
Appendix A

Endorsement Letters
I am writing this letter in support of the A.S.S.E. Student Section of Western Carolina University who are competing for the Outstanding Student Section Award for 2010-2011.

I have known Dr. Tracy Zontek, faculty advisor and A.S.S.E. student section leader for the past 24 months. During this time she has lead the formation of the Western Carolina University A.S.S.E. Student Section under our Piedmont Chapter of A.S.S.E. in Greenville, SC. Dr. Zontek is a very dedicated professional. In addition to being the assistant professor and student section leader Dr. Zontek is a CSP and a CIH which proves her interest and professionalism to the health & safety profession.

Tracy and her students continuously raise the bar in their efforts to expose the students to learning opportunities as well as community service. Dr. Zontek and her students also recognize the benefits of benchmarking with safety professionals which they believe opens many doors to learning about a wide variety of safety and health opportunities.

The student section was organized in 2009. Because of this Dr. Zontek and her students have worked especially hard to develop all of their successful programs and activities without the benefit of a mature student section.

Some of their student activities include Region VI PDC attendance and strong participation and winning success in student research competition, Piedmont Chapter annual PDC attendance, community service activities such as the Tuckaseegee River Clean-Up Project and Project FIRE (Fuel Intervention for the Rural Elderly), community water quality monitoring to assess possible sources of contamination, formaldehyde monitoring in Physical Therapy anatomy lab providing documentation for their accreditation process, and demonstrating the use of colorimetric tubes for younger students to generate interest in health & safety.

In addition the students generate monthly newsletters, they have a great student section website to capture on-going activities and generate interest among new students, they have a strong summer internship program and they organize an impressive list of speakers to present at their monthly student section meetings such as Dr. Joe Pickel from Oak Ridge National Laboratory.

As you can see this young student section has achieved a tremendous amount in their short existence and we wish to help them improve in the coming years.

We, the Piedmont Chapter of A.S.S.E. in Greenville, SC truly believe the student section at Western Carolina University is a model student section in all they do and we ask for your support in recognizing their efforts and successes in naming them the Student Section Award recipients for 2010-2011.

David Day

David Day  MS, CIH, CSP
Manager, EHS Auditing
Sealed Air Corporation
To: Program Evaluators of Student Section Awards  
From: Kurt Rayburg, CSP, CPEA President of Piedmont ASSE Chapter  
Re: Recommendation of student section for award

I have been an active member with ASSE for 25 years, support and am involved with many aspects of the association. I would like to recommend the student section of WCU for the outstanding student section award for the below reasons.

The student section has been organized and lead by the faculty advisor Tracy Zontek. Dr. Zontek has done a tremendous job in communications and bringing students to the levels needed to become successful EHS professionals. Her commitment, time and efforts have resulted in many accomplishments such as internships, field trips for awareness and enhancement of learning objectives. Many graduates have been placed in high level positions due to achievement from an academic level.

The student section has been actively involved in the ASSE at both the local, regional and national levels. Students have displayed interest and commitment to learn and promote the safety profession by attending poster contests, community service representing ASSE, development of web based materials to bring light to their accomplishments and holding fund raisers to help the growth of the student section.

Having been a part of other chapters with student sections, the WCU students have far exceeded any other section with respect to involvement with ASSE, and showing interest in promoting the EHS role in their efforts.

I recommend the students due to the commitment, hard work, interest and academic achievements that have been accomplished by the majority of its members.

Respectfully,

Kurt Rayburg

Kurt Rayburg, CSP, CPEA  
President, Piedmont Chapter ASSE
September 17, 2010

Dr. Tracy Zontek
Western Carolina University
106A Moore Hall
Cullowhee, NC

Subject: Appreciation

Dear Tracy:

I want to publicly show my appreciation and respect for you in working with the students of Western Carolina University and the American Society of Safety Engineers.

As you may recall, our first meeting was about 5 years ago, when I was the Regional Vice President for ASSE, and was working to revitalize the student portion of our regional conference. You inquired about participating, and as a result of your efforts, we had several students from WCU participate. Much in part as a result of your efforts, the student portion of the conference remained an active and vital part of the program. To be honest, it was nearly voted out the year before due to problems with previous students and a lack of participation. In other words, your participation, the caliber of students you brought with you (representing WCU), and the way they conducted themselves at the conference helped save the student part of our program! This has not only been of benefit to WCU, but other area colleges and universities with safety and environmental programs as well.

...but it didn’t end there. The next year, not only did you have more students and more winners, but your WCU students nearly swept the awards. We were even able to send one student to the ASSE future leaders conference in St. Louis as a result of his work and our cooperation.

...but it still didn’t end there. As a result of the WCU student participation, we were able to work with the local Chapter (Piedmont) that includes Cullowhee, and we were able to form a new and very strong student section. This included seed money and a chance for some of the wonderful WCU students and faculty to show their leadership skills in running a part of an organization that includes an international membership of more than 32,000 safety, health, and environmental professionals.

You have made a difference, Tracy. Please note that I do not make this statement lightly. I have had the pleasure of knowing you over the last several years, and I am proud to consider you a colleague and a friend. Your work with the students and the networking with professionals in the field have helped students gain valuable skills and make important connections as they develop their future.

Again, thank you for your efforts, and for your continued support as we work together to protect people, property, and the environment. You are a credit to Western Carolina University, our great Society of safety professionals, and the noble field of higher education. We need more like you out there, teaching and empowering our future leaders.

Sincerely,

James H. Morris, III
Former Regional Vice President, Region VI – ASSE (2005-2010)
Current Programs Chair, ASSE Region VI
I am writing this letter in support of the A.S.S.E. Student Section of Western Carolina University who are competing for the Outstanding Student Section Award for 2010-2011.

Dr. Tracy Zontek, faculty advisor and A.S.S.E. student section leader has lead the formation of the Western Carolina University A.S.S.E. Student Section under our Piedmont Chapter of A.S.S.E. in Greenville, SC. Dr. Zontek is a very dedicated professional. In addition to being the assistant professor and student section leader Dr. Zontek is a CSP and a CIH which proves her interest and professionalism to the health & safety profession.

Some of their student activities include Region VI PDC attendance. I have also been provided information indicating that the Student Section has been participating and winning success in student research competition, Piedmont Chapter annual PDC attendance, and community service activities.

I believe the student section at Western Carolina University is a model student section in all they do and wish to support them in recognizing their efforts and successes in naming them the Student Section Award recipients for 2010-2011.

Vincent R. Miller Jr. CSP
Region VI Vice President
March 31, 2011

To whom it may concern,

I am writing this letter in support of the Western Carolina University Chapter of the American Society of Safety Engineers (ASSE). I am the Program Director of the WCU Environmental Health Program and I am quite familiar with the student membership and the faculty advisor.

Although this chapter has only been established for a little over a year, it has been enthusiastically embraced by the student membership and has been one of the most active student organizations on campus. The faculty advisor, Dr. Tracy Zontek has worked tirelessly to establish a charter, raise funding, and organize scholarly engagement activities for the membership. The parent organization, the Piedmont Section of ASSE, has been a rock-solid supporter of the WCU organization. They have provided funds, supported activities, organized activities and offered up internships for the student members. WCU went from having a mediocre interest in occupational safety to full immersion. The entire WCU community from the Chancellor and Provost down to the College and School are all familiar and proud of what the WCU Chapter has meant to the community.

I can honestly say that I am extremely proud of the work that these students and faculty have done to bring WCU to this superior level of professionalism and so quickly. Western has already benefited in so many ways and the strong start has carried over to the next class of students. I believe that this organization is well established and will continue to be.

I have no hesitation in giving this organization my highest endorsement for national recognition. Please contact me if you have questions about this information.

Yours Truly,

Burton R. Ogle, Ph.D., CIH, CSP
March 31, 2011

Dear Outstanding Student Section Award Committee,

The purpose of this letter is to confirm that the Western Carolina University ASSE student section has worked tirelessly and collaborated well with me, the faculty advisor.

The officers have tested and refined their organization, leadership, and team building skills, while providing opportunities for others to assist. They took on a tremendous amount of work this year, and still are full of new ideas to expand our organization. They have created a strong organization that students want to join and we currently have a robust slate for election of next year’s officers.

We appreciate all the assistance and support from the Piedmont Chapter and Region VI officers and members. They have been extremely generous with their time and understanding of student issues. Other organizations (AIHA, NEHA) have asked for student involvement, but they do not have the same commitment to students that ASSE has shown the WCU students.

Thank you for your careful consideration of our first student section award application, in our first full year as an ASSE student section.

Sincerely,

Tracy L. Zontek, PhD, CIH, CSP
Assistant Professor, Environmental Health Program
Western Carolina University
Appendix B

Yearly Goals
Long Term Goals
Summary of Health and Safety Program
History of WSU ASSE Chapter
Chapter Newsletters
Agenda from ASSE Advising Day Event
Examples of Student Research Projects
WCU ASSE Chapter Goals for 2010-2011

This is the first full academic year of the newly formed WCU ASSE student section. The officers and faculty advisor set the following goals.

1. **GOAL: Recruit new students to chapter**
   - Objective: Increase student membership to 25% of students enrolled in the Environmental Health program

   **OUTCOME:** The student membership increased to 41.5% of students enrolled in Environmental Health Program.

2. **GOAL: Complete required activities to submit for Outstanding Student Section Award (OSSA)**
   - Objectives
     - Recruit a Chair to coordinate OSSA
     - Publish 4 newsletters
     - Send one representative to two parent chapter meetings
     - Conduct 6 meetings per year, 4 technical
     - Review and revise bylaws
     - Cooperate with Faculty Advisor

   **OUTCOME:** This award submission serves as evidence that all objectives were met to accomplish this goal.

3. **GOAL: Renew Student Government Association (SGA) membership**
   - Objectives
     - Complete required paperwork in August
     - Petition for space to create student section webpage
     - Request funding for printing
     - Request funding for travel to parent chapter conference

   **OUTCOME:** SGA membership for the student section was successful. This membership allowed the club approximately $50 in printing costs, access to the university web page development software and server space, and $360 to assist with student travel costs to professional meetings. (This is especially critical as our parent chapter is a 2.5 hour drive each way.)
WCU ASSE Chapter Long Term Goals

1. GOAL: Complete a service learning project each academic year, in conjunction with WCU Facilities Services.
   - Objectives
     - Contact Jon Maddy, WCU Safety Officer
     - Identify appropriate project and scope of assistance
     - Request funding for equipment and other required items
     - Complete project and write official report

2. GOAL: Establish consistent community service opportunities for students.
   - Objectives:
     - Chapter officers and members identify service opportunities and choose several for chapter participation
     - Establish a Chair position for community service to coordinate, advertise, and establish chapter connections
     - New Chair will coordinate at least one community service project per semester

3. GOAL: Increase membership.
   - Objectives
     - Increase membership to 50% of Environmental Health majors
     - Attend at least 2 lower level classes each semester to discuss the benefits of ASSE membership and section involvement
     - Attend at least one off-campus even to recruit new majors and ASSE members

4. GOAL: Provide more professional development activities for students.
   - Objectives
     - Identify nearby industrial facilities that would provide tours for students.
     - Consider offering a continuing education opportunity for students and professionals.
     - Investigate “job shadowing” for with local professionals.
Summary of Health and Safety Program

The Environmental Health (ENVH) Program at WCU began in 1977. It is accredited by the National Environmental Health Science and Protection Council (EHAC), one of thirty accredited programs in the U.S. The first graduation of environmental health majors occurred in 1981. Until Dr. Burton Ogle joined the faculty in 2002, the ENVH program focused on preparing sanitarians and public and environmental health professionals.

Additional current faculty includes Associate Professor Phillip Kneller, Dr. Tracy Zontek, and Dr. Brian Byrd. Professor Kneller specializes in food safety, environmental law, institutional and residential health, and solid and hazardous waste. Dr. Byrd specializes in public health pests (vector-borne disease) and epidemiology.

Dr. Ogle and Dr. Zontek are both CSP and CIH certified and have extensive professional experience in occupational health and safety. Dr. Ogle specializes in toxicology, air quality and general public, environmental and occupational health. Dr. Zontek specializes in industrial hygiene, water quality, and general public, environmental and occupational health. Both Drs. Ogle and Zontek have been Faculty Fellows at Oak Ridge National Laboratory for the past five years researching the industrial hygiene approach to nanoscale materials.
**WCU ASSE Student Chapter History**

In the spring of 2007, Jim Morris, the student research chair for the ASSE Region VI Professional Development Conference sent a request for student abstracts. Three WCU students were accepted and they, along with Dr. Tracy Zontek attended the PDC. During this and subsequent conferences, ASSE Piedmont Section discussed their support of a new student section at WCU. In late 2008, Bill Wiseman (founding member and former President of WCU ASSE student section) began organizing students and bylaws for a new student section. It was more than a year’s worth of emails, phone calls, and the commitment from Raja Shekar, David Day and Bill Geddings from the Piedmont section before the chapter bylaws would be written and enough student interest generated.

On March 19, 2010, the ASSE Piedmont section granted WCU its student section charter and generously donated $2000 in start-up funds. The Piedmont section also announced it would fund three $1000 scholarships every year in the spring semester to students based on academic achievement, service and need.

A year later, March 28th 2011, WCU ASSE has grown from its original 12 members to 27. Students have received more than $6000 dollars in scholarships, numerous internships, presented and won at conference competitions, and some graduating members have obtained employment through ASSE’s mentorship. In the years to come, WCU ASSE plans to expand its membership base even more and maintain the strong relationship with its parent Piedmont chapter, while continuing to provide a valuable resource to its student members and the surrounding community.
MESSAGE FROM
THE PRESIDENT

Welcome to the first quarterly issue of the Catamount Safety newsletter! We hope you enjoy reading this edition and look forward to future printings.

Over the last couple years, an enormous amount of coordination has gone into bringing ASSE to Western Carolina University. The time spent is well worth it and the students, faculty, and staff are very grateful. This year is off to an impressive start already and no doubt we will continue to prosper as students, mentors, and eventually EH&S professionals.

After many months of hard work by our previous President, Bill Wiseman our faculty sponsor Dr. Tracy Zontek, and many of the ASSE Piedmont chapter members, Western Carolina University finally received a charter for a student chapter of ASSE. Primarily composed of environmental health majors, there are students of various majors too like engineering.

“Western Carolina University is a wonderful university educating thousands of students from around the United States and the world for careers in all industries. Hence, the environmental health program is needed to educate all students about being safe at work, and the program provides the education needed for the students to work in any industry worldwide,” said Diane Hurns, public relations manager of ASSE. “We celebrate the partnership and look forward to helping it grow in the future, especially as ASSE celebrates its 100th anniversary in 2011.”
Now a senior at Western and nearing completion of my Environmental Health degree, I am serving as the President of WCU’s ASSE student chapter. I have had the pleasure of working and studying with many people in the industrial hygiene, safety, and sanitation subfields. This past summer I interned with the United States Public Health Service where I worked alongside EH&S professionals at the Phoenix Indian Medical Center. Daily hazard surveillance rounds, air quality monitoring, radiation and chemical dosimetry, and emergency preparedness planning/drills made up most of summer and has provided me unique insights. Our chapter is brand new, with lots of work ahead, but with my experience and that of my fellow officers below, I have no doubt will succeed and have fun doing so.

Although entering my last year of undergraduate schooling, I feel that there is still so much more ahead of me. I am currently serving as the treasurer of Western Carolina’s ASSE chapter and I am more than happy to do so. Since the beginning of my studies in environmental health, the safety field has always peaked my interest. I have had the pleasure of studying the safety field both here in the United States at Oak Ridge National Laboratory and abroad with DHL Shipping Solutions in Breda, Netherlands. Those professional experiences coupled with the superior education our professors have provided gives our chapter confidence that it has the students it needs to be successful.

As a junior at Western Carolina, I have been able to spend the last two years studying various Environmental Health topics as I work towards my degree. Courses in public health, radiation safety, water quality, and toxicology have given me a broad foundation of knowledge to build on in the future. I look forward to advancing in my career at Western and gaining experience to help guide me in the world of public and environmental health after graduation.

Christopher Caler
Layne Arnold
Drew Craig
Nick Hammond

I am a senior in the Environmental Health major and hold the position of ASSE Secretary. Over the summer I worked with Fluor Corporation as a Health, Safety and Environmental Intern. The employees I worked with allowed me to further my knowledge about safety and how it impacts the environment as a whole. ASSE has allowed me to expand my skills in the health and safety world, as well as meet those who have an extensive passion for the subject. As a new club, ASSE will continue to grow with the emerging leaders in the Environmental Health major.
Saturday, September 4th WCU ASSE was invited to visit and mingle with the parent chapter at a baseball game at Fluor Field in Greenville, S.C. The game was exciting and the Greenville Drive beat the Hickory Crawdads 10-2.

It was an excellent opportunity to meet other ASSE members and talk shop. Several conversations revolved around the newest trends in safety as well as tips on resumes, interviews, and possible internships. We would like to thank the Region VI Piedmont Chapter for their gracious hospitality and look forward to future games.

Mark Your Calendars!!

September 22nd @ Western Carolina (11:15am)
Radionuclides in Water w/ Catherine Rosfjord, NC DENR

October 2nd @ Western Carolina (8:00am Service Learning!)
Project FIRE w/ Ben Fiddle, Jackson County Dept. on Aging

October 11th @ Western Carolina (1:25pm)
Hearing Protection Devices w/ Sally Crabtree, 3M

October 21st @ Western Carolina
ASSE Piedmont Chapter Meeting w/ Kurt Rayburg

November 10th @ Western Carolina (12:00pm)
Webinar – “Safety is Free....”

November 22nd @ Western Carolina (11:15am)
Catamount Safety Newsletter 2nd Issue
26th Annual Tuckaseegee River Cleanup!!

Every year in the Spring, students of WCU and the community gather to clean up one of the largest natural resources of the mountains of Western North Carolina. This event has become the largest single day river clean up in the United States. This year there were 600-900 people gathered to clean 27 miles of river, removing about 3-5 ton of garbage. Events of such importance in the community could have not been absent of WCU ASSE students.

Several members of the club gathered on Saturday, April 17th to be part of this rewarding experience. After acquiring a white water raft, they paddled down the Tuck and stopped to collect several bags of cans and bottles, a couple tires, and various other pieces of garbage. The boat was full after a couple hours of work and the crew returned to campus to enjoy some well deserved food.
I have been a member of ASSE for about a year and a half now, I’ve made some great contacts at ASSE conferences that helped propel me into my career in construction safety. When ASSE was first mentioned to me I immediately knew that it would be beneficial to my future goals if I joined this organization.

I have enjoyed networking with other safety professionals and learning all about the new safety technology that is coming out. These conferences have seminars that focus on specific areas of safety which gives you a different perspective and vantage point on how you will approach, solve and implement strategies to reduce risk to workers as well as promote awareness and accountability for the safety program.

I graduated in the summer of 2010 and was offered a job with Fluor, an excellent company whose attitude towards safety programs is very stringent. I was offered a job after working my internship on a major highway construction job in Utah, where I trained our employees on the project safety rules and requirements that have been mandated by OSHA, EPA, client and our joint venture companies. I do still get valuable information from the ASSE website and articles that are always filled with good information and ideas on how to improve safety in the workforce.

ASSE is an organization that I will encourage anyone that is interested in being a safety professional to become an active member, the benefits of the networking capabilities are endless and I will remain and continue to be an active member. I am keeping current with the website and following and listening in on webinars which is just one of the few ways ASSE puts out information that will help people improve their Health, Safety, and Environmental management approaches.

I am a HSE safety specialist and I help instill, enforce, implement and improve the safety of our 2,000 + employees and our work sites. My job is very demanding and also very fulfilling knowing that I am saving lives every day. We are all responsible for our own personal safety, but there has to be a personal commitment by all workers to follow all safety rules and policies which will always result in the prevention of job related injuries and illnesses.
September 22—Catherine Rosfjord from the NC Department of Natural Resources discussed radionuclides in water with the ASSE student section. Western North Carolina is a hot spot for radon for radon in air and water and Ms. Rosfjord provided valuable information on testing for and abating radon.

October 2—Project FIRE (Fuel Intervention for the Rural Elderly) Walter Fox, Drew Craig, Matt Hall, and Chris Caler donned some leather gloves, ear muffs and safety glasses to chop donated timbers to usable firewood. The firewood is used by low-income elderly whose only source of heat and cooking fuel is wood.

October 11—Sally Crabtree from 3M Occupational Health & Environmental Safety lead an educational session on choosing the appropriate hearing protective devices. As always, Ms. Crabtree made learning fun and the students appreciated all the free PPE that she demonstrated and provided.

October 21—The Piedmont ASSE section hosted its monthly meeting at WCU! DJ Neubauer from Spartanburg Regional Medical Center gave an interesting lecture on OSHA emergency action plans (EAPs). He stressed the importance of accurate EAPs and provided many examples from his experiences in a variety of situations. This meeting was an excellent opportunity for students to meet professionals from our parent section. The following day, a few Piedmont chapter members, David Day and Kurt Rayburg, got to fish in our local Tuckaseigee River with some students. Thank you Piedmont Chapter for driving up, taking the time to visit, and providing us with not only useful information, but fun too!
ASSE Region VI, made up of sections from Delaware, Kuwait, Maryland, NC, SC, Virginia and Washington DC hosts a professional development conference each year with a student research competition. Six WCU students were chosen to present their research.

**Drew Craig, Overall winner.** The use of RFID to improve the effectiveness, efficiency and safety of chemical inventories at the Center for Nanophase Materials Sciences. “The conference was beneficial to me as a student because it provided me with a chance to practice my public speaking abilities and to promote myself as a potential employee for those present and looking to hire.”

**Samantha Connell, Poster winner.** Using the condensation particle counter (CPC) to evaluate clean room particle counts during high and low occupancy and developing contour maps to help characterize clean room control technology at CNMS.

**Layne Arnold,** Identifying deficiencies in construction safety injury/illness reporting. “The conference helped me focus in on what exactly I am interested in. Hearing what the ASSE professionals had done with their careers and past job changes showed me that the possibilities are endless in this field of work.”

**Nick Hammond,** Exploring sustainability in health and safety. “I benefited from the conference by learning how to network better and give the initial handshake. This will be very important for future job opportunities.”

**Stephanie James,** Assessing safety and environmental health measures in elderly homes in Angoon, AK. “By presenting a topic of mine that had a foundation based on my courses in the program, I gained a better understanding of "real-world issues" that can arise from the material that I've learned from my textbooks.”

**Chris Caler,** Complete hazard assessment within a gross anatomy laboratory. “The ASSE PDC embraced student involvement by helping with research, supplying financial support, and offering "insider" information which is extremely valuable and not easily attainable anywhere else.”
Below are some upcoming events, meetings, and important dates for the spring of 2011. Not all events, meetings, and guest speakers are listed, but additional information will be passed along in emails. Get involved!

We have 19 T-shirts remaining too, so if you haven’t gotten one yet and would like to they are yours for just $15.

Mark Your Calendars for 2011!!

January 31st @ Western Carolina (1:25am in MO 101)
First official meeting of the spring semester.

Feb 15th @ Western Carolina
Scholarship Applications are due to Dr. Zontek

Feb 22nd ADVISING DAY @ Western Carolina (1 PM, Moore 107)
Find out about research, internship and other ENVH insider information.

March 17th @ Greenville, SC (All day event)
Piedmont Chapter’s Professional Development Conference, watch for email about sign ups!

April meeting date / time to be announced
Officer elections

Officers
President, Chris Caler
ccaler1@catamount.wcu.edu

President—Elect, Layne Arnold
carnold1@catamount.wcu.edu

Treasurer, Drew Craig
dwcraig1@catamount.wcu.edu

Secretary, Nick Hammond
nbhammond2@catamount.wcu.edu

Committee Chairs
Chapter Award, Levi Mines
lmines1@catamount.wcu.edu

Web, James Fincannon
jwfincannon1@catamount.wcu.edu

Faculty Advisor
Dr. Tracy Zontek
zontek@email.wcu.edu
ASSE INTERNSHIP SPOTLIGHTS

Jordan Blazer, a senior in the Environmental Health program recently completed an internship at Owens Corning Incorporated, a fiberglass plant. Jordan shadowed an environmental safety professional during his time there, and gained valuable experience in the work environment. Blazer stated that his favorite part of the internship involved getting things you simply couldn’t learn in class, and experiencing the professional environment in person, as opposed to an outsider looking in. According to Blazer, the most significant thing he learned on his internship was how important your contacts are. “Never close any doors, you never know when the people you meet can help you find jobs somewhere down the line”, Jordan said. Internships help one learn outside of a classroom, and gain valuable professional insight into future career paths. Jordan says that the classes that have helped to prepare him the most for this field and his internship were Occupational Health and PPE. Blazer was required to use various PPE on the internship, ranging from steel toed boots to face respirators. In concluding the interview, Blazer stated “internships are the best thing to prepare you for the real world, and I learned the most from his internship.”

Author - David Rollick

Nick Hammond is a senior and ASSE Secretary that recently finished his internship at FLUOR Corporation in Greenville, South Carolina. Hammond worked for FLUOR Corporation in the summer of 2010. While he was there, his internship consisted of making a digital scrapbook, publishing an article on heat stress, attending several training classes, working with material safety datasheets, presenting safety topics for executive meetings, and composing an agenda for Safety Week. There were many skills he was able to work on during his internship. For example, he was able to improve his ability to work with a team, he learned the importance of asking questions, and he obtained knowledge about substance abuse, industrial hygiene, and human resources. Hammond experienced many pros and cons of interning at this specific corporation. He enjoyed getting to work in a professional and relaxing environment. On Wednesdays he got to play Ultimate Frisbee with his fellow employees, and further strengthened his networking skills. Hammond enjoyed his internship so much that he which helped to hopes to either work with FLUOR, or somewhere else in the safety field.

Author - Emily Patton
On December 2, Western Carolina University was visited by a mysterious guest who hailed from deep within the smoky bubbly confines of Oak Ridge National Laboratory. Well, perhaps the guest is not so mysterious but certainly the research and technological developments being done at Oak Ridge are. The guest was the venerable Dr. Joe Pickle. Dr. Pickle is a polymer research scientist gone operations/safety manager. Dr. Pickle has a lasting connection with the university through hosting student internships (one of which I myself was lucky enough to participate in). Students of all majors and interests came out for the event to fill up the entire room of Moore 107 as WCU ASSE hosted Dr. Pickle for a special lecture on the happenings within Oak Ridge and special safety precautions that must be taken when dealing with some of the facilities (lasers, super magnets, brain-scramblers). Students made a time of the event and Dr. Pickle entertained questions for the better part of an hour on nano-particles, Einstein’s laboratory, and green technology of the future. The students were more than appreciative for the presentation WCU ASSE dly plush-catamount for his soon to be born baby. Western also ex- extended the invitation to Dr. Pick- le that he was welcome any- time in the future whether it be for academic purposes or just Dr. Joe Pickle and his wife Dr. Deanna Pickle

Author - Drew Craig
ASSE members attended an etiquette dinner hosted by Dr. Beth Loftquist, on February 8th. The lecture based dinner was supplemented with brochures and handouts further explaining the aspects of a formal meal. As students begin to venture into the real world and begin the process of interviewing for jobs, they will need to be equipped with the tools to handle themselves in any business setting. General guidelines regarding appropriate conversation topics, formal introductions, name tag placements, and seating arrangements were discussed. As many interviews include a meal, this was excellent place for students to practice.

Once seated, students began to navigate their way through the table setting. Learning which silverware should be used for what, how to pass an item to a table member and what to do with your napkin helped to give a better understanding of the way the table etiquette works. Students enjoyed the experience and were able to acquire skills they would not have elsewhere. Dr. Loftquist’s presentation will prove to be advantageous for all students whether interviewing for a job or working as an intern. After participating in the etiquette dinner, students will now be able to represent themselves, Western Carolina University and their future employers with dignity and pride.

Author - Layne Arnold

Upcoming Events:
Thursday March 17— Greenville Chapter Professional Development Conference
Tuesday March 22— Environmental Health Research Symposium
Volunteering
Community Service Water Quality Monitoring

ASSE members Stephanie Caler, Kelly Nicewonger and those students enrolled in the Fall 2010 Water Quality Control class recently coordinated a community service water quality project involving the investigation of fecal coliform contamination of a local waterway, Savannah Creek, in Jackson County, N.C. As it was recently declared a Category 5 impaired waterway on the 303(d) list by the Environmental Protection Agency, a local grassroots organization known as The Watershed Association of the Tuckasegee River (WATR) started an awareness campaign and monitoring program for the stream.

The environmental health sciences program at Western Carolina University assisted their efforts by dedicating projects in the water quality control class toward fecal coliform testing, in an effort to assist the WATR organization. The aim was to evaluate which sections of Savannah Creek had high fecal coliform counts in an attempt to pinpoint potential contamination sources. ASSE members Caler and Nicewonger spearheaded the project and coordinated with WATR executive director Roger Clapp to determine where students should collect water samples, and twelve locations for testing were confirmed.

The project helped students learn about potential waterway contamination sources, water quality control and management, the significance of the presence of fecal coliform in water and the dangers posed by coliform in waters used for human consumption and recreation. **Author - Stephanie Caler**

ASSE Members Teaching other Students about Colorimetric Detector Tubes

ASSE students assisted the ENVH-230 class in performing a lab using colorimetric detector tubes (CDT). The purpose of this lab was to demonstrate the way in which CDTs can be used to analyze ambient air quality for potentially dangerous chemicals or gases. Students helped to set up each sampling station containing a chemical, detector tube, a pump, instructions and proper disposal of used tubes. Ammonia, ozone, hydrogen chloride, formaldehyde and car exhaust were all measured. ASSE students then helped ENVH-230 student to take their own samples using the correct number of pump strokes and interpret results. By teaching the ENVH-230 class about CDTs and air quality, both ASSE members and students came away with a better understanding of air sampling methods. **Author - Layne Arnold**
On Thursday, March 17, 2011, the WCU ASSE Student Chapter went to the parent section ASSE Piedmont section professional development conference in Greenville, SC. The conference began with remarks from the chapter’s President Elect, Alex Sierra, and President, Kurt Rayburg. The first presentation by Dean Glenn, Global Director of Environment, Health and Safety at Remy International, Inc, detailed innovative plans to improve safety that he had learned and helped develop at his time at Remy and his prior place of employment, TRW Automotive. Glenn was an excellent speaker, and provided an interesting talk.

After Glenn’s presentation, attendees had the option of going on a tour of the Grainger facility, attend presentations on warehouse safety or the new OSHA crane standard or network. The 1.1 million square foot facility, established in 1988 contains about $77 million in inventory, of which accuracy exceeds 99%. The facility has 60 inbound docks and 60 outbound docks, a conveyor automaton added in 2003, and are in operation 24 hours a day, 5 days a week. One of the highlights of the tour included the “bright ideas board”, which is a place where employees can go to suggest new innovations to improve safety in the facility. There was also a demonstration involving a swing-reach device, which is the means employees use to retrieve much larger freight. Students learned a great deal about industrial operations by participating in this tour.

After lunch, Elle Lackey, who has spent over twenty years working in petrochemical and refining industries, as well as automotive and hospital management, presented on process safety management, which involves identification of the hazard, such as hydrogen sulfide, and providing a proactive and systemic approach to evaluation and prevention. The primary method discussed involves the “5 Whys” in which specific questions are asked to determine the full nature of the problem.

Following Lackey’s presentation, David Lynn, who has worked with OSHA, Duracell, Owens Corning, and Fluor, stepped up to provide his presentation on the zero incident policy, in which techniques are developed to deal with upholding the five major principles: management commitment, employee involvement, worksite analysis, hazard prevention and control, and safety and health training.

The conference was a valuable learning experience for many first time attendees, as well as a place for experienced and new students to make valuable connections for future jobs and even secure future internships. See page 2 for scholarship winners.

Author - David Rollick
President’s Farewell

What an incredibly memorable year! WCU ASSE’s first year has seen membership more than double in size, completion of a student chapter award submission to nationals, three student scholarships, and numerous student presentations honored in both of the Carolinas. It is with some sadness that I am leaving such a hardworking and fun group behind, but I know that they are in good hands. Layne Arnold will replace me next fall and I have the utmost confidence she will be a competent and enthusiastic leader. I will continue to study environmental health issues in the future too. After graduation, I will be attending the University of Maryland at College Park for the upcoming fall semester. Coincidently, my wife Stephanie got accepted into the same program, so thankfully we will both be pursuing our Masters in Public Health degrees together. My final parting advice for all of you is to study hard, get involved in club activities, or even take charge of them, and it will pay dividends in the future.

Piedmont Section Scholarship Winners

The ASSE Piedmont chapter announced the winners of its student scholarship competition. Three scholarships were awarded of $1000 each. The scholarship winners were Samantha Connell, Mikayla (KayKay) Deardorff, and Maika Lee. The three scholarship winners shared how ASSE has impacted them as well as the impact the scholarship has made. Samantha Connell says, “Through ASSE, I have been able to meet and network with professionals in the top of their fields. Professional members are always full of encouragement and eager to assist students. The scholarship that they provided me with has opened doors, financially, for my future endeavors.” Maika Lee says, “I wish I would've known about ASSE earlier because it is definitely something that has helped me grow in this major, especially getting hands-on experience in networking and my communication skills. This scholarship will really help me pay off some school loans and help me this summer since I will be interning for the United States Public Health Services in Phoenix, Arizona, so I'm definitely blessed and grateful for that.” Finally, KayKay Deardorff expressed that “the ASSE chapter at Western has provided me with many opportunities and has encouraged and supported me to do my best. I am extremely thankful that they granted me a scholarship and look forward to being a member in the years to come.”

Author - Jessica Stevenson

Amanda McQueen, a student in WCU’s Environmental Health program, recently submitted two research projects to NCUR, the National Conference of Undergraduate Research, both of which were sponsored by Dr. Burton Ogle.

Her first presentation was on the “Comparison of noise emissions of standard electric and gas-powered chainsaws”, which discusses specifically how harmful levels of noise associated with chainsaw usage can affect the user. McQueen’s study examined the acoustical difference between gasoline and electric chainsaws in actual use. Her comparisons were made in sound measurements at the operator’s ear using a Type I noise dosimeter and noise measurements at various distances from the cutting operation. The measurements were taken with various tree diameters and compared with each other to determine if and how much of a difference in noise occurs from each type of chainsaw. Finally, all of her measurements were compared to the OSHA Noise regulations to determine if measurements are found within acceptable levels. Josh Turner assisted with this study.

Amanda’s second project, on “Potential use of an ozonator to improve air quality in unoccupied spaces.” The study was a case-control measuring aerosol dust in two unoccupied areas, one without treatment, which served as a control, and the other following the application of ozonated air, which was the case study. McQueen conducted air sampling and analysis using the NIOSH Method 0500 for Total Dust Collection. Her air samples from each area were collected and measured gravimetrically using a microbalance, then compared to determine if any difference in aerosol dust could be found between the treated and control areas. Author - David Rollick

Upcoming Events:
Sunday April 3 — Valley of the Lilies Half Marathon
Monday April 4 — Chapter Meeting
Saturday April 16 — Tuck River Clean Up
Wednesday April 27— Gas Detection by Walter Fournet, MSA
Friday April 29— Party!
ASSE Sponsored ENVH Research Symposium

On Tuesday, March 22, the ASSE chapter sponsored the Environmental Health Research Symposium, part of the WCU Undergraduate Research Symposium. All of the presentations were expertly done and well researched. Following are the highlights of each presenter and their presentation.

The first presenter was Erin Gymburch, “Not in my Backyard...Unless I’m Poor, Uneducated or a Person of Color: The Toxicity of PCBs, Midnight Dumping, and Environmental Racism in Warren County, North Carolina” which highlighted the illicit waste disposal practices utilized by many industries and how they centered around areas of low socioeconomic status, particularly Warren County in North Carolina. Gymburch is also presenting at the National Conference on Undergraduate Research.

Lailani Rockholt’s presentation on “Water quality monitoring in the Carol’s cabins community” was actually conducted due to a very interesting story. Her cat began wheezing one day, and after some extensive testing, it was found that the water she had been giving it had abnormally high nitrate levels, and while not enough to harm a human, it was enough to give the cat health problems. Apart from the nitrate levels, the community’s water supply proved to be very safe and well maintained.

Erin Gymburch’s second presentation was on “Progress toward the development of a molecular assay to discriminate two species of Bed Bugs”. This presentation discussed the quest to create an assay to determine differences between two species of bed bugs using gel electrophoresis.

Closing the symposium was Virginia Hopkins’ presentation on the “Application of the Agilent BioAnalyzer for the identification of two morphologically similar mosquitoes.” The presentation demonstrated the use of the Agilent bioanalyzer, which is a microfluidics-based platform for sizing, quantification and quality control of DNA, RNA, proteins and cells. This goal of this research was to distinguish between two very similar mosquitoes, Aedes atlanticus and Aedes tormentor, the techniques proved unsuccessful, but provided valuable methodic insight nonetheless.

Health and safety research presentations by Drew Craig, Chris Caler, Stephanie James Caler, Layne Arnold, and Samantha Connell were also highlighted. Details about these research studies can be found in the last issue of Catamount Safety. The above presentations provided valuable insight and ideas for all in attendance, and serve not only as valuable resources for other students to create their own research projects, but also as a testament to the innovation and persistence of the Environmental Health program in their continuing research and goals to prepare students for the professional world. Author - David Rollick

ASSE Sponsored Student Advising Day Event

On Advising Day, Tuesday February 22, the ASSE Club hosted a peer mentoring meeting. Students discussed getting the most out of your major, what classes to take and when, internships and how to get one, and the importance of building your resume every semester. ASSE members helped others develop strategies for being successful in college and beyond. ASSE Club officers also discussed the importance of membership in professional organizations.
Welcome from Dr. Zontek and ENVH Faculty

ENVH Classes, what to take and when to take them, ENVH Faculty
  - 8 semester plan
  - Suggested Liberal Studies courses

Why ENVH is a good pre-professional major (Jessica Stevenson)
  - Pre-professional advisor Emily Sharpe, easharpe@wcu.edu

Examples of student internships
  - PHS (Jessy Phillips, Heather Foster, and Erin Gymburch presenting. Also Chris Caler and Stephanie James Caler completed PHS internships),
  - Oak Ridge National Lab (Samy Connell presenting, also Drew Craig),
  - Owens Corning/ASSE (Jordan Blazer, also Nick Hammond Fluor/ASSE),
  - NC Health Departments (Rebekah Presnell/Kelly Nicewonger)

Graduate school, start preparing now! (Chris Caler and Stephanie James Caler)

ASSE and why joining professional associations is important (Drew Craig and Nick Hammond)
  - What ASSE has done for me
  - Opportunities to get involved
  - Become an officer
  - Attend the professional development conference http://piedmont.asse.org/ ($15 for students)
    - All day on Thursday March 17 at Fountain Inn, SC at Grainger (we will car pool)
    - Meet professionals (internships/jobs), attend education sessions and tour facility
    - Note for other classes about your attendance at this professional conference

Examples of ENVH student research
  - ASSE Region VI Professional Development Conference, Myrtle Beach SC
  - WCU Undergraduate Research Expo (March 22 and 24, 12:35 – 1:50, Moore 107)
  - National Conference on Undergraduate Research

Leadership, service learning, and scholarship, putting it all together with the eBriefcase (Kaykay)

Questions and networking with other students

Make sure to sign in, and also sign up for additional information.
USE OF GRAVIMETRIC ANALYSIS TO DETERMINE IF OZONE CAN IMPROVE AIR QUALITY IN AN UNOCCUPIED LOCATION

Amanda McQueen - Western Carolina University

National Conference on Undergraduate Research - 2011

Purpose

- Determine if the presence of ozone will reduce the overall dust particle count in the air
- Safer work environment
- Determine if this method could be used as an alternative method for air purifying in similar locations

Ozone and Dust

- Three atoms of oxygen (O$_3$)
- Charged dust particles attracted to oppositely charged surfaces
- Two types: ≤0.1 µm diameter
  - Inhalable (airborne material that enters respiratory tract)
  - Respirable (material that penetrates the lung)

Hypothesis

- Ozone will disperse and charge airborne dust particles, causing them to quickly collect on oppositely charged surfaces
- Prove a positive relationship of use of ozone generator and reduction of airborne dust particles
- Prove that commercial ozone generators are effective to control ambient dust particles

The Location

H.F. Robinson Administration Building, Storage Room 6, 3rd floor
Western Carolina University
Cullowhee, NC

Equipment: Pumps

- Gillian Air Con 2 Constant Flow Sampler (high volume)
- Both pumps were pre- & post-calibrated

Equipment: Ozone Generator

- Rainbow Air Activator 500 Model #5200-11
- 0.35 amp-60 Hz
Methodology

- Collect and analyze samples using the NIOSH Method 4500 for Total Dust Collection
- Gravimetric analysis

Methodology

- Monitor location before and after treatment with commercial ozone generator
- Air will be pumped at approx. 22 LPM for around 40 hours before and after treatment
- Ozone generator will run for 12 hours
  - Addition of 24 hours to air out

The Set-Up: Pumps (Pre-Treatment)

- Because of timer function, the ozone generator ran for 12 cycles of 1-hour time spans, followed by a 1-hour rest period

Duration

<table>
<thead>
<tr>
<th>Pre-Treatment Pumps (22-23 LPM)</th>
<th>Ozone Generator (High)</th>
<th>Post-Treatment Pumps (22-23 LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38 hrs, 11 mins.</td>
<td>12 hrs.</td>
<td>44 hrs, 3 mins.</td>
</tr>
</tbody>
</table>

Observation: Pump 2 randomly shut off.

Weighing: Gravimetric Analysis
**Results: Filter Weights**

<table>
<thead>
<tr>
<th>Filter</th>
<th>Post-Weight (µg)</th>
<th>Pre-Weight (µg)</th>
<th>Total Dust (µg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Pre-Pump 1)</td>
<td>0.00001442</td>
<td>0.00001377</td>
<td>0.00000065</td>
</tr>
<tr>
<td>4 (Post-Pump 1)</td>
<td>0.00001467</td>
<td>0.00001408</td>
<td>0.00000059</td>
</tr>
<tr>
<td>2 (Pre-Pump 2)</td>
<td>0.00001406</td>
<td>0.00001379</td>
<td>0.00000027</td>
</tr>
<tr>
<td>5 (Post-Pump 2)</td>
<td>0.00001454</td>
<td>0.00001423</td>
<td>0.00000031</td>
</tr>
<tr>
<td>3 (Pre-Blank)</td>
<td>0.00001367</td>
<td>0.00001359</td>
<td>0.00000008</td>
</tr>
<tr>
<td>6 (Post-Blank)</td>
<td>0.00001437</td>
<td>0.00001432</td>
<td>0.00000005</td>
</tr>
</tbody>
</table>

**Results: Averages**

<table>
<thead>
<tr>
<th>Pre-Ozone (Pumps 1&amp;2)</th>
<th>Post-Ozone (Pumps 4&amp;5)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00000046µg</td>
<td>0.00000045µg</td>
<td>0.00000001µg</td>
</tr>
</tbody>
</table>

**OBSERVATIONS:**
- Disparity in blank filter weights
- Disparity between Pumps 1 and 2
- Filters were not desiccated
- Moisture
- Seepage of dust collection onto filter pad
- Pump 2 may not have been running for entire time

**Conclusions**

Special thanks to Dr. Burton Ogle and Josh Turner

Questions? Comments?
Comparison of Chainsaw Noise Emissions
Amanda McQueen
Western Carolina University

Purpose
• Examine the acoustical difference between gasoline and electric chainsaws in actual use
• Compare these results to other indicators (i.e. cost, functionality)

Overview

Methods
• Compare gas and electric chainsaw noise by using:
  — Personal dosimetry
  — Sound meter level readings at various distances

Equipment
- Makita DCS 540 4-stroke Gas Chainsaw
- Earthwise CS30014 10amp Electric Chainsaw

PPE
- Hearing Protection (i.e. foam ear plugs, ear muffs)
- Heavy gloves
- Chaps

Calibrated with: QC-10 calibrator 114dB-1000Hz
Set up for OSHA compliance monitoring:
5 dB exchange rate, slow response

Measurements: Within Hearing Range
The Set-Up

Correct PPE ✓
Equipment in place ✓

Measurements: In Close Proximity (1-3 ft.)

Measurements: At The Periphery (6-12 ft.)

Ancillary Trial

Ancillary Trial Measurements

RESULTS

• All results compared to OSHA standard for noise:
  − Permissible Exposure Limit (PEL)
  − Time Weighted Average (TWA)
  • Projected duration of time

Results: Personal Dosimetry

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Gas Chainsaw</th>
<th>Electric Chainsaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavg</td>
<td>97.3 dBA</td>
<td>43.6 dBA</td>
</tr>
<tr>
<td>Dose</td>
<td>5.478%</td>
<td>0.162%</td>
</tr>
<tr>
<td>Projected dose</td>
<td>275.8%</td>
<td>4.380%</td>
</tr>
<tr>
<td>Projected TWA (8 hr)</td>
<td>97.3 dBA</td>
<td>67.4 dBA</td>
</tr>
</tbody>
</table>

*OSHA uses A-weighting (dBA)
Results: Mobile Dosimetry

<table>
<thead>
<tr>
<th>Type of Measurement</th>
<th>Gas Chainsaw</th>
<th>Electric Chainsaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background Noise Level</td>
<td>65.0 dBA</td>
<td>65.0 dBA</td>
</tr>
<tr>
<td>Idle in Hearing Zone</td>
<td>75.5 dBA</td>
<td>0.0 dBA</td>
</tr>
<tr>
<td>Revved in Hearing Zone</td>
<td>100.2 dBA</td>
<td>89.9 dBA</td>
</tr>
<tr>
<td>1 foot away</td>
<td>101.4 dBA</td>
<td>92.7 dBA</td>
</tr>
<tr>
<td>3 feet away</td>
<td>97.9 dBA</td>
<td>91.3 dBA</td>
</tr>
<tr>
<td>6 feet away</td>
<td>93.7 dBA</td>
<td>90.9 dBA</td>
</tr>
<tr>
<td>9 feet away</td>
<td>92.3 dBA</td>
<td>89.2 dBA</td>
</tr>
<tr>
<td>12 feet away</td>
<td>90.6 dBA</td>
<td>88.1 dBA</td>
</tr>
</tbody>
</table>

Results: Compared to OSHA Standards

<table>
<thead>
<tr>
<th>Measurement</th>
<th>OSHA Standard</th>
<th>Gas Chainsaw</th>
<th>Electric Chainsaw</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavg/PEL</td>
<td>90 dBA</td>
<td>97.3 dBA</td>
<td>43.6 dBA</td>
</tr>
<tr>
<td>TWA (8 hour)</td>
<td>90 dBA</td>
<td>97.3 dBA</td>
<td>67.4 dBA</td>
</tr>
</tbody>
</table>

- Gas chainsaw supercedes permissible levels, according to OSHA
- Electric chainsaw is in compliance with OSHA

Overall Comparison

<table>
<thead>
<tr>
<th>Type of Chainsaw</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Gas | - Gives into the “bigger is better” male mentality<br>- No power limitations<br>- More costly ($200+)
| - Requires gas (extra money and time)<br>- Requires periodic maintenance<br>- May require numerous attempts to get started<br>- PPE required |
| Electric | - Less expensive ($60-70)<br>- Environmentally friendly (i.e. low emissions of toxins and noise)<br>- Light in weight<br>- Immediate start-up<br>- Less maintenance<br>- No gas required | - Power cord (potential hazard and limitation)<br>- Electrical power needed |

References

- Special thank you to Dr. Burton Ogle

Thank you.
Questions? Comments?
Purpose of the Study

The purpose of this study is to explore the safety, effectiveness and efficiency of various chemical inventory systems as compared to the newest technology - Radio Frequency Identification (RFID). This study was conducted at Oak Ridge National Laboratory (ORNL) - Center for Nanophase Materials Sciences (CNMS), located in Oak Ridge, Tennessee.

Methods and Materials

While RFID is not a new invention, new applications are still being found for this technology, seemingly every day. RFID consists of a small two-part system: a tag, a reader, and a network data collection system. RFID is designed to track multiple items of interest unobtrusively, eliminating the need to be within the immediate proximity of the objects being identified. This also eliminates the need to make physical contact with the items being identified. RFID is capable of tracking items behind or through solid barriers – unlike barcode scanning, where the “line of sight” and close proximity to accomplish identification. Once implemented, RFID is a potential upgrade in technology from the barcode scanning system. The barcode scanning system has a tendency to be intrusive in operations. The RFID system is designed to be unobtrusive in operations. The RFID technology is limited to detecting a single item at a time; RFID can detect multiple items at once, thus increasing efficiency.

For this study, the entire CNMS chemical inventory was reconciled with the existing bar code system. Afterwards, the bar code system was implemented and an assessment was made to identify benefits, if any, that could be derived by switching to the RFID system for all ORNL laboratories. Chemical inventory reconciliation requires five to ten weeks to complete.

Results

Safety Considerations for the Inventory Worker

RFID has the ability to simultaneously identify multiple items of interest unobtrusively, without having to move, interact, or handle the objects. This removes the hazards previously seen with barcode technology wherein each chemical, hazardous or not, was taken from a shelf and scanned manually. In each instance where a chemical is handled, there is a potential for human injury from toxic exposure or physical injury from an explosion (shock sensitive substances), fire (pyrophoric substances), or cuts/abrasion (broken glass). Chemical containers often have residue on the outside of the container that can lead directly to exposure when handled (particularly from an ungloved hand).

Any facility operating under the OSHA Laboratory Standard, and using chemical substances must have a Chemical Hygiene Plan (CHP). The primary goal of the CHP is to reduce hazardous substances by this employing user. RFID, perhaps somewhat unfamiliar or untrained in chemical hazards, to avoid handling a multitude of chemicals and consequently removing the hazard.

Safety considerations for storage practices

RFID labeling improves safety in chemical storage by providing the ability to see every chemical container (volume, container type, hazards associated) and its location within a laboratory instantly after a scan. Allowing a user to see what chemicals and its location within a laboratory is beneficial because it provides a means to better ensure proper chemical storage. For example if an RFID reader detects that a highly flammable chemical is located in a laboratory withoutflammable cabinets then the reader can notify the Laboratory Safety Manager of the exact chemical and location in order to quickly correct the problem. This scenario can also be expanded even more; RFID has the ability to perform a scan that would show any chemical that is located within a lab incapable of handling its associated hazard. RFID can also assist in ensuring that incompatibilities are not stored together by determining proximity between containers. For instance, ensuring acid and base chemicals are stored separately.

Influence on Fire Code Compliance

With the ability to check a single room chemical inventory in real time, fire code compliance issues can be seen and fixed the instant a scan is completed. After completing a scan, a user will be able to deduce what chemicals are residing within an area as well as their volume. By comparing chemical found in the control area to the amount allowed by IFC or NFPA, compliance checks are now done more efficiently and quickly.

Influence on Accuracy

RFID supplies a major leap towards achieving a constantly accurate and updated inventory. Readers used to detect RFID tags can be set to be completely autonomous and scan items the minute they enter a users range. While in contrast having an employee obtrusively rifling through all of the storage cabinets in one laboratory, which could possibly take hours, RFID allows an entire room’s inventory to be updated in minutes without disturbing the chemical or human occupants, whereas barcode scanning and handwritten processes cannot. Having a constantly updated inventory is key to achieving accuracy. Knowing what all is in an inventory can assist in keeping needed supplies on hand by showing what materials are used up and when. This provides the ability to show who is using what, how much is being used, and where it is being used. Consequently, it assists in having a safe and cost-effective strategy of having only what is needed within a laboratory.

Influence on Efficiency

RFID is capable of performing what previously used technologies are not. RFID is capable of scanning multiple items at once, in some instances thirty or more. This can save a user a tremendous amount of time. Less time is spent doing inventory when the system can scan at a higher rate than a barcode reader and money is saved by lessening the time to misallocate valuable human resources. RFID is capable of simultaneously identifying multiple items of interest unobtrusively, eliminating the need to be within the immediate proximity of the objects being identified. This also eliminates the need to make physical contact with the items being identified. RFID is capable of tracking items behind or through solid barriers – unlike barcode scanning, where the “line of sight” and close proximity to accomplish identification. Once implemented, RFID is a potential upgrade in technology from the barcode scanning system. The barcode scanning system has a tendency to be intrusive in operations. The RFID technology is limited to detecting a single item at a time; RFID can detect multiple items at once, thus increasing efficiency.

Discussion and Conclusion

A study was done at ORNL CNMS in order to determine and maximize the benefits of implementing an RFID system to record chemical inventory. Results found indicated that there were improvements in accuracy, efficiency, safety, and compliance. RFID limits the amount of time employees spend checking chemical containers which greatly reduces the threat of exposure thus creating a more safe working environment. RFID can pinpoint the location of hazardous materials making fire code compliance far simpler than ever before. RFID saves time and decreases costs by lowering man hours taken for inventory.

While with all of its benefits it does come with some limitations, some of which users may deem crucial flaws. These limitations include cost effectiveness, a substantial learning curve, and sensor blocking. With each passive RFID tag costing approximately 30 cents a piece, it is easy to see how a large facility with a high volume of chemicals would be weary to implement such a system. History has shown though, that as technology improves and grows older its costs decreases and cheap RFID tag availability is inevitable. RFID although simple in components is complex in software and implementation. Much of the work done by hand and calculations done by computers are rolled into one device as an RFID reader. While the reading of the signals to be extremely useful, it is also possible for the signal to be blocked by metal objects and near metallic surfaces as they distort the radio waves to unusable frequencies.
The objective of this study was to identify gaps in illness and injury data of the construction industry and determine if differences among contractor and subcontractor injury/illness rates can be partitioned.

In order to evaluate gaps in illness and injury reporting, a number of sources were examined. First, a review of peer-reviewed literature was explored. Then governmental sources, such as the Occupational Health and Safety Administration (OSHA) the National Institute of Occupational Safety and Health (NIOSH) and Bureau of Labor Statistics (BLS) was reviewed. Finally, industry groups were consulted.

The construction industry is vital to our development and infrastructure. The National Occupational Research Agenda Construction Section Council has identified 15 strategic goals for the construction industry, #14 relates to improving the surveillance of hazards and outcomes (NORA, 2008).

Data can be partitioned by trade, but not necessarily by general versus subcontractor. Data are likely underestimated. The previous studies address gender, race, and location, type of job, training and type of injury when determining the causes of construction injury or illness.

A vast discrepancy was evident between the statistics presented by OSHA, NIOSH and BLS. The varying statistics are most likely due to misclassification of employee injuries and underreporting (CPWR, 2008). The United States lacks an accurate surveillance system to monitor occupational safety in the construction industry. The NIOSH research agenda for construction has also identified the lack of data as a serious issue (NIOSH, 2009).

The following gaps in data were observed from review of literature.
- Lack of complete data
- Lack of data by detailed industry
- Lack of data by self-employed, undocumented workers, and small firms.
- Lack of uniformity among tracking between federal, state, insurance and private entities
- Little data on productivity measures
- Lack of consistency in occupational and industrial coding systems
- Lack of reliable data to measure consequences
- Overall worker misclassification
- Inability to separate general contractors from subcontractors (CPWR, 2008)

This study has confirmed many deficiencies in construction injury and illness reporting and provided some direction for future study.
- Collaborate with National Construction Safety Executive group to their review survey methodology for additional data collection
- Evaluate additional sources of construction injury data, such as workers compensation data, insurance companies, and industry groups
- Develop and pilot a survey instrument to discern general contractor injury/illness rates from subcontractors

The author would like to acknowledge the WCU College of Health and Human Sciences, and ASSE Piedmont Section and Region VI chapters for support of this project. Special thanks for Neil Henry for use of pictures.

References


Study Purpose

The purpose of this study was to conduct a comprehensive hazard surveillance and analysis of operations within the gross anatomy laboratory of Western Carolina University while focusing specifically on occupational formaldehyde exposures.

Background

A typical gross anatomy lab inherently poses several hazards in regards to the health and safety of students and employees. Periodically, hazard assessments are conducted to ensure not only legally enforceable regulatory compliance is maintained, but a continuously safe operating environment. The single greatest hazard is formaldehyde exposure from constant volatilization and potential spills. Formaldehyde (usually 37% by volume within Formalin) is one of the most commonly used compounds to preserve biological tissues for long term study; however, it poses unique challenges due to its sensitizing potential, known carcinogenic effect on animals, and probable carcinogenic effects on humans.

It is also colorless, flammable, and strong smelling while producing watery eyes, burning sensations, coughing, and nausea in airborne concentrations above 0.1ppm. There are National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) analytical methods for employee exposure monitoring for regulatory limits. The 29 CFR 1910.148 Appendix B (OSHA) was used to determine if airborne exposure existed beyond regulatory guidelines via breathing zone measurements.

Beyond formalin, various chemicals can be stored within a gross anatomy lab including disinfectant chemicals like quaternary ammoniums, sanitizing agents like bleach, and spill control agents like Polyform-F or Infutrace. An up to date MSDS system, properly separated chemicals, and airborne chemical concentrations is imperative in safeguarding the welfare of workers.

Materials

\textbf{Miran IB2}  
- Flow rate: 6.8 L/min  
- Particle size range: 2.5 – 14.5 microns  
- Concentration range: >0.10 ppm  

\textbf{RAE Systems Smoke Tube Kit}  
- 10.5% RH range  
- 32° - 104°F Temperature range  

\textbf{PPF}  
- Nitrile gloves  
- ANSI Z87 safety glasses  
- Lab coat

Results of III Air Sampling Protocol

A worst case sampling strategy was used to determine the greatest exposure potential from accidental exposure. Using the 1.4 ppm reading from the personal breathing zone, since it was the highest value recorded, a TWA was calculated to be 0.65ppm. (1.4 ppm x 24 hr) ÷ (0 ppm x 4 hrs) = 3.568 hrs ÷ 0.75 ppm, 0.75ppm is below the OSHA PEL Time Weighted Average of 0.75ppm; however, it is above the 0.5 ppm action level. Negative pressure was also observed.

Figure 1 - Gross Anatomy laboratory design layout. Note: Fig 1 is not to scale.

Methods

On Wednesday January 27th 2010 at 13:50, the Miran IB2 spectrophotometer was used in conjunction with smoke tubes to collect pressure differential data and formaldehyde concentrations while reviewing all laboratory safety systems and protocols. The study participant was a full time employee working within the gross anatomy laboratory in the Health Sciences building at Western Carolina University. This employee spent no longer than 4 hours a day within the lab. Before any sampling was conducted, a calibration was performed and documented. All adjoining rooms and the lab itself were tested for negative pressure and CH$_2$O levels. During air monitoring, the collection tube was placed within the employee breathing zone and the Miran IB2 was held parallel to the floor. This is significant because OSHA employee exposure Permissible Exposure Limits (PELs) require measurements at the employee breathing zone. Time and tasks performed were recorded throughout the air monitoring campaign to compare potential exposures to specific work activities or situations. Finally, the safety shower, emergency eyewash station, sharps container, CH$_2$O neutralizer, MSDS, and PPE inventory were checked for compliance with ANSI/ISEA, OSHA, and NIOSH regulations.

Results

<table>
<thead>
<tr>
<th>Location</th>
<th>Range (ppm)</th>
<th>Mean (ppm)</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hallway</td>
<td>0.0 – 3.0</td>
<td>0.0</td>
<td>13:50</td>
</tr>
<tr>
<td>Toilet</td>
<td>0.1 - 0.1</td>
<td>0.1</td>
<td>13:50</td>
</tr>
<tr>
<td>Women’s Locker Room</td>
<td>0.0-0.0</td>
<td>0.0</td>
<td>13:50</td>
</tr>
<tr>
<td>Men’s Locker Room</td>
<td>0.1-0.1</td>
<td>0.1</td>
<td>14:02</td>
</tr>
<tr>
<td>Lab – Ambient Air</td>
<td>0.1-0.2</td>
<td>0.15</td>
<td>14:15</td>
</tr>
<tr>
<td>Lab – CSC 1 Closed</td>
<td>0.1-0.2</td>
<td>0.2</td>
<td>14:17</td>
</tr>
<tr>
<td>Lab – CSC 2 Opened</td>
<td>0.1-0.2</td>
<td>0.2</td>
<td>14:23</td>
</tr>
<tr>
<td>Lab – CSC 3 Opened</td>
<td>0.1-0.4</td>
<td>0.35</td>
<td>14:25</td>
</tr>
<tr>
<td>Lab – Brain Container</td>
<td>1.1-1.4</td>
<td>1.25</td>
<td>14:29</td>
</tr>
</tbody>
</table>

Discussion/Conclusion

Overall the results indicate that the gross anatomy laboratory is operating in a safe and legal manner. With airborne concentrations of CH$_2$O below the PEL, TWA, CH$_2$O is within regulatory compliance. However, it is above the action level and current safety policy (keeping CSC’s closed while not in use and never to have more than three open at any given time) should be continued. Given that supply and exhaust vents are not uniform, it is conceivable that some air current short circuiting may be occurring.

Most of the air pressure flows were being pulled into the laboratory which is ideal. The men’s changing room was the only real outlier in regards to pressure differentials and is due to the air intake being active. If the air exhaust is kept off in the men’s changing room, like the women’s changing room, the best possible airflow is achieved. Perhaps a written policy should be implemented to keep certain HVAC systems on or off to accomplish the ideal air flow.

While testing with the Miran showed results, personal monitoring by ones self is difficult since data is not recorded by the machine. It is a two person job to record data and maintain a proper breathing zone monitoring campaign going. Different equipment like passive badge dosimetry could reduce the monitoring workforce, but it is not as accurate.

MSDS were easily accessible, but a separation of archived and current chemicals was not being practiced. The recommendations to create two separate binders, alphabetized, and with an index summary of chemicals in the front was made. Water temperatures for the eyewash were in acceptable ranges; however, a more regular water flow testing needed to occur. Building of microbial activity was in their department a problem for such systems and a more regular schedule of flushing this system was recommended too. Sharps were in appropriate containers and for added safety they were autoclaved for transport to their respective waste streams. Gloves and goggles were in excellent supply and working order, but there is a concern with the safety glasses being utilized. Given the splash potential when dealing with the brain container in particular, safety goggles is highly recommended. N95 respirators are also on hand as a convenience to students, but they are not appropriate for CH$_2$O due to absorptive issues and should be removed.

References


Acknowledgements

The authors would like to thank Dr. Kathy Sturdivant of the WCU Department of Physical Therapy for assistance with filing. This research was made possible due to the leadership and resources of Western Carolina University and the Piedmont Chapter and Region VI of the American Society of Safety Engineers.
Measuring Ambient Air Concentrations in a Research and Development (R&D) Clean Room Environment

Samantha L. Connel[1], Burton R. Ogle, Ph.D., CIH, CSP[2], Tracy L. Zontek, Ph.D., CIH, CSP[2], Scott Hollenbeck, CIH[2], and John Jankovic, CIH[2]

[1] Western Carolina University – School of Health Sciences - Environmental Health Program, Cullowhee, North Carolina

Purpose of the Study
The purpose of this study is to assess the effectiveness of using a condensation particle counter (CPC) to evaluate particle contamination in a research and development (R&D) clean room. Additionally, this study will attempt to graphically represent clean room particle counts associated with processes in order to help better understand particle origin. This study was conducted at Oak Ridge National Laboratory (ORNL) – Center for Nanophase Materials Sciences (CNMS), located in Oak Ridge, Tennessee.

Introduction
The US Federal Standard 209 defines a clean room as: a room in which the concentration of airborne particles is controlled to specific limits. There are several different types and classes of clean rooms, based upon the amount of ambient particle concentration present. The clean room characterized in this study is a Class 1000 R&D clean room, meaning that there are fewer than 1,000 particles of 0.5μm or greater under operating conditions[1].

Clean rooms are simply controlled environments that protect the manufacture of microelectronic silicon chip, high-grade optics, and other products that require uncontaminated air. Processes enclosed in clean rooms include etching, electron imaging, vapor deposition, photo-resist techniques, and others.

Traditionally, clean rooms have been monitored with stationary optical particle counters (OPC). These instruments are costly, not well suited for portable measurement, and can be difficult to operate (often requiring technical expertise). Since OPC are included in clean room certification protocols, they will not soon be replaced; however, it would be of great benefit if particle counts in a clean room could quickly, cheaply and easily be monitored.

This study propose the use of a condensation particle counters (CPC) as a tool to measure particle concentrations associated with the general clean room area and from processes inside the clean room.

The clean room at the Center for Nanophase Materials Sciences (CNMS) protects and maintains the integrity of research microelectronics. This study will monitor particles during high and low occupancy/use of the clean room to better understand the contributions of particles from various processes.

Methods and Materials
The monitoring for this research was conducted using two TSI® Model 3007, condensation particle counters (CPC) - one to collect background particle counts and the other to collect process particle counts. Background monitoring allows for normalizing the process particle counts by subtracting particles contributed by background sources such as the heating and cooling system:

Process Particle Counts (PPC) = Process Measurements (PM) – Background Measurements (BM)

The protocol used for this project followed a dual CPC method of sampling inside the clean room. The TSI manufacturer’s instructions were followed before every sampling campaign. Measurements acquired on June 23, 2010 and June 29, 2010 were taken during high occupancy (a.k.a. “operational”) of the clean room as opposed to July 6, 2010 and July 7, 2010 which were considered low occupancy (a.k.a. “at rest”). Particle concentration depends on several factors: personnel, operations, ventilation, etc; inevitably, particle concentration is thought to be higher with the presence of equipment and personnel [1]. Therefore, measurements were taken at both times to differentiate between particle generation sources.

An architectural layout of the floor ground of CNMS was obtained in order to identify sampling locations. A total of 278 points were applied using Virtual Sampling Plan (VSP) according to the purposeful geometric method. Areas monitored include the clean room, the outer microscope rooms and the corridor. The microscope rooms and corridor were monitored for comparison. A log of approximately 15 seconds was recorded to provide a mean for each sampling location.

Acknowledgments
A special thank you to Darrell Thomas, Drew Craig, Michaela Herle, Dale Hersey, Jason Taylor and Joe Pickle.

Results
Provided in the following table are the mathematical averages and ranges of each area monitored during high and low occupancy.

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>AVERAGE</th>
<th>RANGE p/cc</th>
<th>AVERAGE</th>
<th>RANGE p/cc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gowning</td>
<td>0.33</td>
<td>0-2</td>
<td>0.17</td>
<td>0-1</td>
</tr>
<tr>
<td>Wipe Down</td>
<td>0.08</td>
<td>0-1</td>
<td>0.17</td>
<td>0-1</td>
</tr>
<tr>
<td>Bays</td>
<td>0.17</td>
<td>0-2</td>
<td>0.19</td>
<td>0-1</td>
</tr>
<tr>
<td>E-beam</td>
<td>0.20</td>
<td>0-2</td>
<td>0.07</td>
<td>0-1</td>
</tr>
<tr>
<td>Inner</td>
<td>0.00</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Microscope</td>
<td>30.17</td>
<td>0-676</td>
<td>9.57</td>
<td>0-65</td>
</tr>
<tr>
<td>Chases Outer</td>
<td>0.50</td>
<td>0-2</td>
<td>0.50</td>
<td>0-1</td>
</tr>
<tr>
<td>Microscope</td>
<td>387.47</td>
<td>236-806</td>
<td>357.65</td>
<td>224-700</td>
</tr>
</tbody>
</table>

Discussion
This study assessed the effectiveness of using a condensation particle counter (CPC) to evaluate particle contamination in a R&D clean room. These results indicate that the use of a CPC inside the clean room allowed for more precise measurements and the indication of exactly which processes were end-point particles. The CPC was able to identify that the pumps located inside the chases were the sole major source of particle generation. This could not be determined with a stationary instrument such as an optical particle counter (OPC). Limitations of this study were primarily associated with instrumentation. The researcher found few but imperative problems while using the CPC; a detectable size range of 10-100 nm; battery power consumption; and, instrument data retention (memory). These limitations may not occur during smaller projects.

Conclusion
This study suggests that the dual CPC method is a useful and meaningful way to measure the ambient particle concentrations in a clean room as well as differentiate particle emission sources. This study also implies that contour mapping is a successful mechanism for locating particle emission sources or “hot spots” in clean rooms. Although the clean room at CNMS is considered to be a class 1000 R&D clean room meaning there are fewer than 1000 p/cc at >0.5 microns; it seems appropriate to measure particles in the nano-size range as well. A larger particle concentration at the nano-size range could possibly cause negative effects amongst the processes.

References
3. Personal interview. Darrell Thomas, lead clean room engineer.
Exploring Sustainability in Health and Safety
Hammond, N., Zontek, T., & Ogle, B.
Environmental Health Program, Western Carolina University

**Objective**

The objective of this literature review was to identify intersections in sustainability efforts and health and safety.

**Methods**

This study was completed by evaluating peer reviewed literature, professional organizations, and private companies.

*Sustainable organizations are safe organizations.*
- Chris Patton, Former ASSE President

**Results**

Sustainability is improving the quality of human life while living within the carrying capacity of supporting ecosystems. This concept has become more relevant in the recent years as the earth continues to become unnatural. Various uses of man made equipment, inadequate use of natural materials and other economic depressors have weakened the environment and are not improving our quality of life (Sustainability, 2010).

**Roles in Sustainability**

- CEO identifies sustainability as a goal in mission and vision
- Management systems, life cycle assessment, and risk assessment are used to identify and prevent injuries, illnesses, as well as environmental impacts
- HSE must be an equal player to environment, productivity, and other key benchmarking items (Taubitz, 2010)

**Examples of Sustainability**

- **Green Construction**: is the practice of creating structures and using processes that are not as harmful to the environment compared to other construction methods
- **Pollution prevention** (P2) is reducing or eliminating waste at the source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and re-using materials rather than throwing them away
- **Biomass** is a type of renewable energy that includes several sources from living and non-living organisms such as; garbage, wood, waste, landfill gases, and alcohol fuels
- **Environmental Remediation** is the removal of pollution or contaminants from environmental media such as soil, groundwater, sediment, and surface water for the general protection of human health and the environment (Dunlap, 2009)

**Conclusions**

Sustainability is critical to the new triple bottom line: people, planet and profit. Companies must consider new approaches to health and safety to ensure better environmental impacts, stronger human resources, and healthier lifestyles.

**Significance and Future Study**

Sustainability is a fundamental aspect of health and safety; however a number of challenges exist.

- Discovering resources for continuous growth and improvement
- Eliminating waste while maintaining quality products
- Proper planning and larger amounts of staff interaction on sustainability initiatives
- Educating health and safety professionals about the life cycle sustainability (Adams, 2006)

**References**

Assessing Safety and Environmental Health Measures in Elderly Homes in Angoon, AK

James, S.N., Ogle, B.R., Ph.D., CIH,CSP, and Zontek, T.L., Ph.D., CIH, CSP
Western Carolina University, School of Health Sciences, Environmental Health Program

Study Purpose

The purpose of this study is to identify and address safety hazards in the homes of elderly natives in Angoon, Alaska, including trip and fall hazards, fire safety concerns, environmental health issues and other potentially harmful living conditions.

Background

The Southeast Alaska Regional Health Consortium (SEARHC) serves the native population in 18 communities in Southeast Alaska, one of which is Angoon, Alaska. In 2008, the consortium adopted an elder care program that incorporated environmental health assessments of the homes of elders as part of a program to increase injury prevention and improve the overall health status of elderly natives within the community. Angoon was chosen as a target community for this project.

Falls account for more than half of all hospitalizations due to injuries for the Alaskan native population in Southeast Alaska. The development of this project was a result of a regional recognition of trip and fall hazards in elderly homes throughout the tribal communities.

The environmental health assessments involved a collaboration between the injury prevention department, elder care program and the environmental health department at SEARHC. Surveys are conducted on an annual basis to evaluate the progress made within each home and to address any new concerns that arise between assessments. Areas of interest include, but are not limited to, fire safety measures, building layout, accessibility for handicapped and disabled elders, safe electrical wiring, easy access to telephones and light switches, safe flooring to reduce or prevent falls and trips and the installation of assistance devices such as handrails and shower benches.

Materials

Personal protective equipment
- Gloves
- Eye protection
- N95 respirators
- Kneepads

Equipment
- Flashlights
- Tape measure
- Digital camera (Olympus Stylus Tough 8000)

Data Collection
- Housing survey checklists
- Consent forms
- Letters of intent
- Housing interviews

Methods

Participants were SEARHC employees from the injury prevention department, elder care program and environmental health department. Elders in the community of Angoon were selected using the age criteria (age 65 or older) and elders with disabilities were given priority based on increased risk of injury and a greater need for special accommodations. Sixteen homes were chosen for this study.

Representatives from the injury prevention department ensured that each resident completed a consent form that would allow entry of the organization into the home for this study. The elder care program representative evaluated the specific needs of each resident, based on his or her disabilities and personal concerns. Representatives from the environmental health department visited each home to perform an environmental health assessment, which included a visual survey of the home and an interview with the residents. Photographs were taken to record each hazard or need that was discovered, which would later be used to create professional reports for the findings in each home. Findings were reported to the local housing authority and community center to plan repairs and alterations within the homes, where necessary. Collaboration with these entities is important for the elimination of safety and environmental health hazards within each home.

Results

Interior Findings

Mold was the most prominent finding in all homes that were surveyed. Following an evaluation of the entire home, it was found that the mold was a result of poor ventilation and water damage. All residents that experienced mold problems reported respiratory problems.

Electrical hazards found within the homes included unprotected outlets and light switches and overloaded surge protectors and extension cords. Lack of electrical wiring in some homes created a trip or fall hazard, as no lights were available in areas that are frequently used, such as bedrooms, hallways and living rooms.

Only one home had railing installed in the hallways to further prevent trips and falls. No homes had shower benches or railings to assist the residents in bathrooms.

Significant trip and fall hazards created by uneven flooring and thick rugs were found in all homes. Floor damage was also found within each home, especially near transitions between floor surfaces and in areas of high traffic.

Exterior Findings

Approximately one half of all homes were found to be without fully functioning smoke and carbon monoxide detectors. One quarter of all homes had no detectors installed, and the remaining homes with this deficiency had detectors, but had not installed them properly within the home.

Inaccessibility was the most pressing problem discovered while evaluating the exterior of each home. More than two-thirds of the homes surveyed experienced problems with uneven steps, rotten porches and collapsing walkways.

Exterior Findings

Two homes were classified as inhabitable due to poor foundation and wall structure, rotting supports, a lack of heat and ventilation and no running water. Some homes were supported by jacks and had rooms that were falling away from the rest of the house.

Three homes had flammable substances stored in the crawl space under the home, including fuel and oil containers.

Discussion/Conclusion

All findings within each home that required the professional assistance of a contractor, construction crew and/or engineer were reported to the proper authorities.

Residents were informed on mold control techniques and how to properly clean their walls and floors with soap, water and a bleach solution. Local tribal housing authority representatives were notified about the structural damage and ventilation issues found within each particular home. They were also notified about electrical issues that created shock and fire hazards.

Some immediate solutions were provided to residents that had overloaded surge protectors and extension cords. The elder care program provided extra surge protectors and/or extension cords to those homes where the items were needed. The program also provided batteries, smoke detectors and carbon monoxide detectors to the homes that were deficient in those areas. The environmental health department representatives instructed the residents about proper installation procedures for these items.

Residents were provided with recommendations to eliminate the use of rugs unless necessary, and local community center employees and tribal housing authority representatives were presented with an order for the installation of hand rails, shower benches and other self-help devices. Assistance was requested for floor repairs and replacements.

For homes with unsafe or inaccessible paths at entrances, the elder care program requested increased assistance from home health aides and repairs or improvements from the local housing authority construction crew.

Homes that were classified as inhabitable were reported to local authorities in an effort to find alternative housing units for the residents that inhabited the homes. Grants and other financial aid were sought for these individuals. Repairs to the existing homes may not be economically feasible, placing focus on attempts to receive funding for new homes to be constructed.

Flammable liquids and other hazardous substances were placed in an alternative storage unit and removed from the crawl space of all three homes. Each crawl space was secured with a tight fitting door and a lock.

The overflow station was found to be a potential result of poor sanitation system planning and a lack of property boundary recognition. Local authorities were notified of this hazard and a request for removal, relocation and repair was submitted to state authorities. The solution to this finding is currently pending and awaiting funding and a professional inspection by the state.

All findings for each home were submitted to residents, local community center employees and the tribal housing authority in the form of a professional report.

Acknowledgements

This research was made possible due to the leadership and resources of the Southeast Alaska Regional Health Consortium and the Alaska Native Tribal Health Consortium. The authors would also like to acknowledge Western Carolina University and the Piedmont Chapter and Region VI of the American Society of Safety Engineers.

References

STUDENT SECTION BYLAWS

Bylaws Western Carolina University Student Section

of the Piedmont Chapter

Bylaws Adopted (Regional Vice President) 

Bylaws Approved by:

Piedmont Chapter President

Area Director (Regional Vice President)*

Student Section Chartered (by A.S.S.E.) 11/30/2009

NOTE: In Regions where Areas have not been established, all functions and responsibilities of the Area Director and the Area Operating Committee revert to the Regional Vice President and the Regional Operating Committee respectively.

(* In adapting these Model Bylaws for individual Chapter use, the Chapter should indicate either Area Director/Area Operating Committee, or Regional Vice President/Regional Operating Committee as appropriate.)

ARTICLE I - NAME

Section 1. The name of this Section shall be the

Western Carolina University (WCU)
(name of school)

Section of the Piedmont Chapter, American Society of Safety Engineers.

Section 2. Hereinafter, the WCU Section shall be referred to as the Section, the American Society of Safety Engineers shall be referred to as the Society. The Piedmont Chapter shall be referred to as the Chapter, the Area Operating Committee shall be referred to as the AOC, the Regional Operating Committee shall be referred to as the ROC, and the WCU University/College shall be referred to as the School.
ARTICLE II - PURPOSES

Section 1. The purposes of this Section shall be to promote the advancement of the safety profession and safety education and to foster the professional well-being and development of its members within its campus and community.

Section 2. In fulfilling its purposes, the Section shall have the following objectives:
   a) To further the professional preparation of the members by sponsoring programs for the advancement of safety and acquisition of technical knowledge.
   b) To improve scholarship and the general quality of work in the Safety Profession by fostering a concern for progress in all areas of safety, among safety educators and practitioners.
   c) To encourage greater professional and social cooperation and interaction among students of safety and allied fields and disciplines.
   d) To unite the resources and skills of students and faculty in programs to benefit Section members, the school and its community.
   e) To assist the Society in the development of effective and relevant educational programs for the preparation of future safety professionals.
   f) To provide encouragement and support to society student activities and foster student member development and retention on its local campus.
   g) To promote participation and entrance into safety/health careers by high school and college students.

Section 3. Nothing in these Bylaws is intended to substitute for, or supersede, rules or procedures established by the school that impact upon the Student Section.

ARTICLE III - MEMBERSHIP

Section 1. Section membership is open to all Student Members of the Society, who are enrolled in the safety or related curricula at the school identified in the Section’s name. To be eligible as a Society Student Member, an individual shall be enrolled in an accredited undergraduate or graduate degree course intended to prepare the
individual for practice in the safety profession or one of its relevant specialties, shall pay an annual renewal fee as designated by the Society Board of Directors, and shall declare in writing the intention to enter the Safety Profession upon graduation.

Section 2. Student Member status may be retained up to one year following graduation, or until the individual is employed in the field of safety, whichever comes first.

Section 3. Section membership is personal and non-transferable.

Student membership dues are a onetime fee of $25.

Section 4. Section members are eligible to vote on all matters brought before them. A majority affirmative vote is necessary for action unless otherwise specified in these Bylaws. On Chapter and Society issues, Student Members are eligible to vote only on the election of officers.

ARTICLE IV - ORGANIZATION

Section 1. The Section is a subdivision of the Chapter, formed and operated by ASSE Student Members attending an educational institution located within the Chapter's geographical area.

Section 2. The Section shall have and maintain a minimum of ten (10) members in order to maintain its charter.

Section 3. In order to maintain its charter, the Section shall identify an advisor (defined in Article V, Sec. 3) and shall provide the Chapter and Society annually with information on the advisor's name, address and telephone number.

Section 4. Formation and maintenance of the Section charter is based on requirements and guidelines set forth in the Chapter Administration Guide, and is subject to the approval of the Chapter and the appropriate AOC (ROC).

Section 5. The Section may be dissolved by the Chapter and/or the AOC (ROC), if such action is deemed to be in the best interests of the Chapter and Society. Voluntary dissolution of the Section shall be by two-thirds of Section members after a 30-day advance written notice by the Section Executive Committee. Voluntary dissolution is subject to the approval of the Chapter and AOC (ROC). Upon dissolution, all Section funds and assets shall be returned to the
Chapter, school, ASSE Foundation or other ASSE entity, depending on the funding source.

Section 6. The Section fiscal year shall begin on July 1 and end June 30. The Section activity year shall begin on July 1 and end June 30.

ARTICLE V - OFFICERS

Section 1. Elected Section officers shall be:

a) President
b) Vice President
c) Secretary
d) Treasurer

NOTE: As options, the President may be designated as Chairperson, the Vice President may be designated as Vice Chairperson or President-Elect, and the offices of Secretary and Treasurer may be combined into one.

Section 2. Duties of officers:

a) The President (Chairperson) shall call, set agendas for, and preside at meetings of the Executive Committee, and preside and set agendas for meetings of the Section membership; shall set goals and objectives for the Section and provide leadership, guidance and direction to officers, committees and members to see that they are met; shall appoint members of the Nominating Committee; shall serve as chief spokesman and representative of the Section to the Chapter, Society and allied groups; and shall submit an annual report of Section activities to the Chapter and Student Member Activity Task Force.

b) The Vice President (Vice Chairperson or President-Elect) shall succeed to the office of the President if the President is unable to serve; shall act for the President when requested to do so by the Executive Committee or members; and shall in general prepare to ascend to the Section Presidency in the following year.

NOTE: The Vice President (President-Elect or Vice Chairperson) may also supervise the work of Section appointed committees or project Chairpersons, if desired.
c) The Secretary shall record, transcribe and distribute minutes of all Section meetings, prepare and distribute meeting notices, maintain all Section records and conduct Section membership development and retention activities under the supervision of the Executive Committee.

d) The Treasurer shall collect and disburse all Section funds, maintain Section financial records including all income and expense activities, collect Section-generated membership fees and dues, handle all Section liaison with financial institutions, submit an annual report of all Section financial activities to the Executive Committee, and keep the Section and Chapter regularly informed as to the Section's financial status.

Section 3. There shall be a Section advisor who shall be either:

a) An ASSE member who is a faculty member of the school where the Section is located, or

b) A formally designated member of the Chapter in whose geographical area the Student Section's school is located.

The advisor shall be an ex-officio member of the Section Executive Committee, and shall serve as liaison between the Section, appropriate school officials, and the Chapter. The advisor shall approve Section activity and financial reports, fund-raising activities, and be consulted on all matters relating to Section dues, fees and Bylaws. The advisor shall ensure that Section activities do not violate School rules and regulations governing on-campus clubs, groups and activities.

NOTE: Any other responsibilities of advisors as required by the school may be added here.

ARTICLE VI - COMMITTEES

Section 1. Elected Section officers and the Section advisor shall make up the Executive Committee, which shall govern the Section according to these Bylaws and within the authority delegated to it by Section members.

Section 2. The Section shall have a Nominating Committee, appointed by the President (Chairperson), for the purpose of developing a slate of Section officers annually for member election. The committee shall consist of three Section members, one of whom shall be a current or past Section officer. The committee shall elect its own Chairperson.
Section 3. Other Section committees may be appointed by the Section President (Chairperson).

ARTICLE VII - NOMINATION, ELECTION AND REMOVAL OF OFFICERS

Section 1. The Nominating Committee shall be appointed by the President/Chairperson annually for the purpose of recommending a slate of one or more nominees for each Section elective office. Publication of the slate, including background and qualifying information on each nominee, shall be completed no less than thirty (30) days before the election is conducted. The election and installation of officers for the succeeding Section activity year shall be completed before March 15.

NOTE: A specific date may be substituted as an election deadline.

Section 2. The term of service for officers shall be for one (1) year beginning July 1.

Section 3. Any 3 Section members may submit a signed petition nominating one or more members for elective office. The petition shall be accompanied by a written acceptance by the nominee(s) and shall be submitted to the Nominating Committee Chairperson no less than fifteen (15) days before the election is conducted. The names and qualifications of the petition nominees shall be distributed to all members within seven (7) days of their receipt.

Section 4. All Section members shall be given the opportunity to vote on the election of officers, through written ballots distributed on campus and/or at a Section meeting.

Section 5. Three Section members, who are neither candidates for elective office, nominating committee members, nor current Section officers, shall be appointed as Tellers to count ballots, confirm the propriety of election/nomination procedures, and announce election results.

Section 6. Elected Section officers may be removed by majority vote of Section members at any regular or special meeting upon presentation of a signed petition from the Section Executive Committee or 3 Section members. Notification of such meeting shall be made to all members at least fifteen (15) days in advance of the meeting.
Appointed Section officers may be removed by the officer who appointed them, or by the Section Executive Committee.

Section 7. Vacancies in elected Section offices occurring during the elected term shall be filled by the succession designated in Art. V, Sec. 1. The resulting vacancy in the office of Treasurer shall be filled by affirmative vote of a majority of Section members upon a nominating slate of one or more candidates submitted by a special member Nominating Committee appointed by the President (Chairperson). The election shall be held at a regular or special Section meeting, notice for which shall be published at least 15 days in advance.

ARTICLE VIII - DUES AND FINANCES

Section 1. Section members shall be assessed an annual student member renewal fee by the Society as determined by its Board of Directors. In addition, applicants for Student Membership may be assessed membership application fees as determined by the same Board. Fees shall be paid annually on the anniversary of the Student Member's election date.

Section 2. The Section may assess its members additional annual fees and dues, upon recommendation of the Section Executive Committee and approved by a majority of Section members voting at a meeting where a quorum is present.

Section 3. The Section Executive Committee, through the Section Treasurer, is responsible for all Section financial activities, under guidelines established by the Society, Chapter, these Bylaws, and the Section Executive Committee.

Section 4. The Section shall provide an annual financial report to the Chapter, Area Operating Committee (Regional Operating Committee) and Student Member Activity Task Force, describing all Section income and expense activities for the preceding twelve (12) months. This report shall be reviewed and signed by the Section Advisor and submitted to the Chapter by July 15.

ARTICLE IX - MEETINGS

Section 1. The Section Executive Committee shall meet upon the call of the President/Chairperson or upon a majority vote of its members.

Section 2. The Section shall hold at least two (2) meetings of its members annually, to acquaint them with its activities and conduct necessary business. Section members at a meeting shall constitute a quorum.
NOTE: A quorum is the minimum number of members that must be present at meetings in order that business may be legally transacted. A specific number should be inserted. Generally the quorum should be as large a number of members as can be reasonably be depended on to be present at any regular meeting.

Section 3. Special meetings of Section members may be called by the Section Executive Committee or by written petition of ten (10) members, submitted to the Section President/Chairperson.

Section 4. Section member meetings and votes shall be required to accomplish the following actions: amendment or these Bylaws, establishment of or change in Section dues or fees, removal of elected officers, and Section dissolution.

NOTE: A 2/3 affirmative vote requirement may be established for any of these actions.

Section 5. Robert's Rules of Order Newly Revised shall govern the transactions of business at Section meetings, unless otherwise specified in these Bylaws.

NOTE: A section describing the required order of business at meetings may be added here.

ARTICLE X - AMENDMENTS

Section 1. Amendments to these Bylaws may be proposed by the Section Executive Committee or by written petition of at least seven (7) members. Amendments proposed by members shall be presented to the Section Executive Committee.

Section 2. Amendments shall be published at least fifteen (15) days in advance of the meeting at which action will be taken on them.

Section 3. Amendments shall be voted on at a regular or special Section meeting where a quorum is present. A majority affirmative vote is required for approval.

Section 4. All amendments approved by Section members are subject to approval of the Chapter Executive Committee and Area Director (Regional Vice President).