



## Department of Natural Sciences, UMES

Editors: A. Potter, T. Christianson, A. Johnson, M. Cheney, W. Smith, T. Mazzaccaro, M. Okulate, T. Aighewi and K. Corbin

### Opinions on Curricula “Greening”

by I. Tito Aighewi

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Several scholars have suggested the introduction of an environmental literacy requirement into the curricula of Non-Environmental Science disciplines in tertiary institutions of the world as a “greening” strategy for fostering global environmental stewardship necessary for enhancing understanding and collaboration in tackling the major environmental risks facing our global village today. However, there is no study on student opinion on this issue. This study was therefore initiated to 1) evaluate the opinion of undergraduate students on the introduction of a worldwide environmental literacy into the curricula of Non-Environmental Science majors as a graduation requirement; and 2) identify any possible demographic differences in opinions among the student subjects polled. We sought the opinion of 800 undergraduates from

African, North American and European universities on the subject and 99% responded. The result showed that a majority (67%) of them supported the worldwide environmental literacy requirement, and those already trained were significantly ( $P < 0.0001$ ) more likely to support it than those untrained. Students from developing countries were significantly ( $P < 0.0001$ ) more likely to support it than those from developed countries; similarly, students in the Arts disciplines were more likely to support it than Non-Arts students as a group. However, no significant differences were observed between students from Francophone versus Anglophone countries, Social Sciences versus Non-Social Sciences majors, and between Education versus Non-Education majors. Some similarities were observed between the opinion of

university-age students in this study and fifteen year old secondary school students from two major international surveys (Research on Science Education-ROSE, and



Program for International Students Assessment-PISA) on science education; further studies comparing these two categories of students are suggested. The need for all professionals to be literate about the science of their surroundings was the most identified reason for supporting the literacy requirement by the students polled. The results of this study thus provide evidence of support by students in the on-going paradigm shift

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towards “greening” the curricula of tertiary institutions and thus reinforces its implementation by leaders of academe and policy makers worldwide.

#### Curricula

Isoken T Aighewi, PhD, M.P.H and Ulamen A. Osaigbovo, MSc, University of Benin, Benin City, Nigeria. Research in Science Education

(In Press)

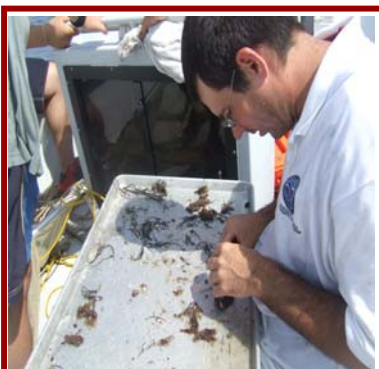
## FACULTY PUBLICATIONS

Love, J.W., J. Gill, and J. Newhard. Saltwater intrusion impacts fish diversity and distribution in the Blackwater River drainage (Chesapeake Bay watershed): Effects on habitat use of freshwater fish populations. *Wetlands*. In Press 2008.

Love, J.W., C.M. Taylor, and M.L. Warren. (In Press). Effects of seasonal stream drying on fish and macroinvertebrate populations in upland Ouachita Mountain Streams, USA). *American Midland Naturalist*. In Press 2008.

Love, J.W. and E.B. May. Species responses to environmental gradients in the coastal bays of Maryland. *Northeastern Naturalist* 14:251-268, 2007.

Love, J.W. and P.D. Chase. Marine fish diversity and composition in the Mid-Atlantic and South Atlantic Bights. *Southeastern Naturalist* 6:705-714, 2007.



Joey Love, Ph.D., undertaking identification and species classification of sample population.

Love, J.W., and E.B. May. Relationships between fish assemblage structure and selected environmental factors in Maryland's Coastal Bays. *Northeastern Naturalist* 14:251-268, 2007.



Striped Bass, *Morone Saxatilis*, examined for infection by Mycobacteriosis in Chesapeake Bay

Jacobs, J.M., Rhodes, M., Howard, D., E.B. May, and R.M. Harrell. An archival review of Mycobacteriosis in Chesapeake Bay striped bass (1975-1995). *Diseases of Aquatic Organisms*. In press, 2008.

Chigbu, P., Jearld, A. & Fogarty, M. J. National Oceanic and Atmospheric Administration and Jackson State University Program in Fish Stock Assessment. *Journal of Geoscience Education*, 55: 541-549, 2007.

Chigbu, P. & Sobolev, D. Bacteriological Analysis of Water. In L.M.L. Nollet (editor). *Handbook of Water Analysis*. Second Edition. Mercel Dekker, Inc., New York, Basel, 2007.

Hearne, J.L., Okoh, J.M., Waguespack, Y.Y., Potter, A.G., and

Williams, C. University System of Maryland: Maryland Course Redesign Initiative, University of Maryland Eastern Shore. The Learning Market Space, Center Chronicles: Featuring initiatives to scale course redesign through state- and system-wide redesign programs, 2008.

Johnson, A.K., J. McHugh Law, Harms, C.A. and J. F. Levine. Multi-tiered health assessment of Atlantic menhaden in the Pamlico River, North Carolina. *Journal of Aquatic Animal Health*. 19: 205-214, 2007.

Farah, I.O., Begum, R.A., Ishaque, A.B. Differential protection and transactivation of P53, P21, Bcl2, PCNA, cyclin G, and MDM2 genes in rat liver and the HepG2 cell line upon exposure to pifithrin. *Biomed Sci Instrum* 43: 116-21, 2007.

Nagchaudhuri A., M. Mitra, C. Havrilla, Y. Waguespack, J. Schwarz, Heavy Metal Biomonitoring by Seaweeds on the Delmarva Peninsula, East Coast of the USA. *Botanica Marina* 50, 151-158, 2007.



Dr. Mitra with student

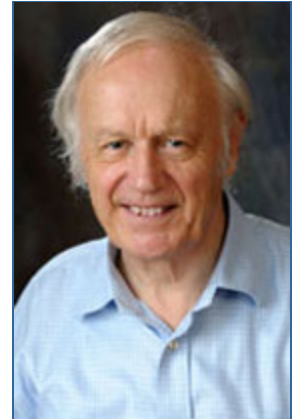
Salina Parveen, Maryam Taabodi, Jurgen G. Schwarz, Thomas P. Oscar, Jeanine Harter-Dennis, and David

(Cont' to pg 3)

## PRESENTATIONS: VISIT OF NOBEL LAUREATE : SIR ANTHONY LEGGETT

UMES was honored on Friday, October 26, with a visit from the 2003 Nobel Laureate in Physics, Professor Sir Anthony Leggett. Sir Leggett was knighted (KBE) by Queen Elizabeth II in 2004 "for services to physics." Dr. Leggett, in addition to his membership in the National Academy of Sciences, the American Philosophical Society, the American Academy of Arts and Sciences, and the Russian Academy of Sciences (foreign member), is a Fellow of the Royal Society (U.K.), the American Physical Society, and the American Institute of Physics, and an Honorary Fellow of the Institute of Physics (U.K.).

During his visit to UMES, he lectured to a standing room only group of students, faculty and other members of the community on "The Effect of Superconductivity and Superfluidity on Today's World." This topic is a result of his research in theoretical, macroscale, condensed matter physics and the foundations of quantum mechanics, utilizing Josephson devices. As a result of this, he has set the foundation for the theoretical understanding of normal and superfluid helium liquids and other strongly coupled superfluids. Before commencing his talk, Professor Leggett gave a brief interview to the local television station WMDT. The interview appeared in the news bulletin at 7:00 PM that evening. He was also interviewed by a staff of WESM, the UMES radio station, for future broadcast. Professor Leggett's visit was sponsored by the American Physical Society.



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## CONFERENCE HIGHLIGHTS

DNS Undergraduates, Graduates and Faculty attended nine Conferences. Over sixty-eight posters and/or presentations were presented. Highlights to be featured in May's Newsletter.

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## FACULTY PUBLICATIONS (cont' from pg 2)

G. White., Prevalence and Antimicrobial Resistance of Salmonella Recovered from Processed Poultry, *Journal of Food Protection*, Vol. 70, No. 11, 2007, Pages 2466-2472.

Nagchaudhuri, A., and **Mitra, M.**, 2007. Rich Learning Experiences for Minority Undergraduate Students through Inquiry based project activities in the field and

laboratory settings. To be presented at the *Proceedings of 2007 American Society for Engineering Education Annual Conference*, Honolulu, June 2007

# GRADUATE STUDENT HIGHLIGHTS

## *Marine, Estuarine and Environmental Science (MEES)*

**Adrianna Ortiz**

Ecology (Year 2)

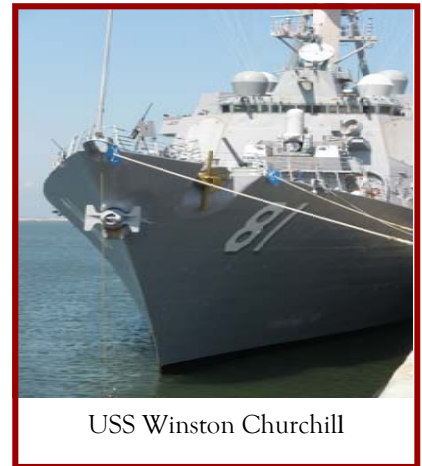
### My Story

Just this week I have distributed my first draft of the complete thesis to my committee for review. My research has been determining the effects of mid-frequency sonar on the blue crab (*Callinectes sapidus*). This research is fully supported by the Surface Combat System, Wallops Island, VA

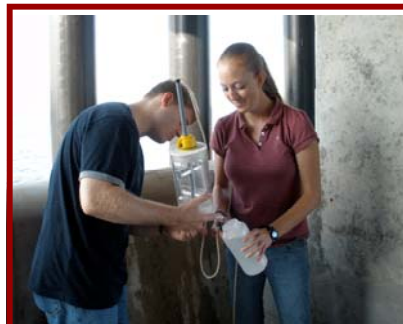


Blue crab (*Callinectes sapidus*) larvae.

(Navy). I worked with the University of Maryland Biotechnical Institute (UMBI) lab to obtain about 1,500 blue crab larvae. I then divided them into one liter bottles. The testing occurred at Naval Station Norfolk (Norfolk, VA) on the USS Winston Churchill. The treatment samples were 'pinged' with seven different intensity



USS Winston Churchill



Sonar Testing Set-Up

(*l to r*) STGC Jason Dobes, US Navy; Adrianna Ortiz, NASA/UMES

(230.5 dB- 200 dB) levels of the mid-frequency sonar (3.3 KHz) range. After the testing was completed, the samples were taken back to the lab for observation on survival. Statistical analysis has shown that there is no significant difference in short-term (~ 23 days) survival among the treatments, or the control due to the sonar exposure.

**Larry Alade, Ph.D.**

As a former graduate student of the Natural Sciences Department, my experiences have not only provided me the platform



Larry's pastime today

to develop and advance my talents as a research scientist, but have exposed me to a variety of valuable opportunities both academically and occupationally. As quoted from Mark Twain, "Don't let school get in the way of your education." Fortunately for me, I believe I was in the right place at the right time with an open mind, ready to explore the unknown territory with the hope of achieving my academic goals.

It all began in the fall of 2003 when I was accepted into the NOAA's Living Marine Coop-

erative Science graduate fellowship program (LMRCSC). As a graduate student, rarely do you have two nickels to rub together. However, the existence of the LMRCSC program not only provided the financial support to pursue my educational goals but extended opportunities to students such as myself to engage in research training opportunities that continued to strengthen my knowledge-base as a marine environmental sciences student. The highlight of my experi-

ence in the LMRCSC was through a summer internship stock assessment program jointly facilitated by the Northeast Fisheries Science Center in Woods Hole and Jackson State University in the summer of 2003. For the very first time, I was introduced to the application of modeling the dynamics of marine fish populations. Although very challenging, I was fascinated with the process of applying mathematical models to

# Outreach Highlights

## The Eastern Shore Restoration and Education Program Marine & Environmental Science Camp

The shortage of potential college students electing to pursue degrees and careers in environmental studies has been identified as a problem across the United States. Environmental studies can translate into a wide range of careers, from wetland restoration to food safety inspection. When asked why students did not follow environmental career paths, many said that they were not aware of these options. In an effort to address this problem locally, UMES' Eastern Shore Restoration and Education Program hosted the Marine & Environmental Science Summer Camp July 7 - 18, 2008, designed to expose the students to environmentally related research careers. Directed by UMES Research Assistant Professor Dr. Andrea Johnson, this project is an important partnership between the Environmental Protection Agency, the National Park Service, Worcester County Public School System, Maryland Coastal Bays Program and the NOAA Living Marine Resources Cooperative Science Center. Major funding was provided by the US Environmental Protection Agency.

Twenty-two high school students (grades 9-12) from Maryland's lower Eastern

Shore were selected to participate in this hands-on camp based at UMES' Paul S. Sarbanes Coastal Ecology Center. Dr. Joseph Love, Dr. Paulinus Chigbu, and doctoral student Lonnie Gonsalves designed research projects for the students focusing on species diversity in the Coastal Bays, fish diets, and land use effects on water quality. An overview of these research topics was presented on the first day of camp, and the students selected the project in which they preferred to participate.

Work on the research projects was supplemented by field trips to nearby agencies. Shark studies were the topic of discussion at the Virginia Institute of Marine Science. The students learned that, if exposed to the sun in shallow water, sharks will get a suntan and that sharks are sensitive to electromagnetic currents. Dr. Richard Brill, a research scientist at NOAA's Northeast Fisheries Science Center and head of the Cooperative Marine Education and Research (CMER), was conducting experiments to determine whether a mixture of metal compounds would effectively repel sharks from fishing gear. This information may lead to the development of new trot line gear that would reduce shark bycatch.

Since waste disposal is an underlying factor that impacted each research project, the students toured two different types of wastewater facilities. The Town of Berlin provided a tour of their spray irrigation site and lagoon system. The wastewater treatment plant professionals gave a tour of the Riddle Farm's plant and lagoon. The students were able to see the various stages of drying sludge and the differing sizes and designs of lagoons. The Riddle Farm wastewater plant operator impressed the group with a sample of treated sewage that was visually identical to the drinking water. No one offered to taste the treated wastewater, however.

The National Park Service provided several



Dr. Love's group (F.I.S.H.) learned to identify fish caught in their nets

field trips during the second week of camp. Park personnel led a nature walk and students seined for aquatic wildlife. Students explored the coastal bays in kayaks and participated in a scavenger hunt on the ocean side. The Assateague National Park provided "Adventure Packs" to all of the campers which included items such as field guides, specimen boxes, journals, colored pencils, a magnifying glass, a rain poncho, and sun screen to help them enjoy the outdoors. These packs were useful during the camp and can be used long after camp is over.

At the Center of Marine Biotechnology, Dr. Rosemary Jagus, Dr. Mary Stapleton and graduate student Sarah Wembe presented an overview of ongoing research on the blue crab in the Chesapeake Bay. Students used microscopes to examine the various stages of the crab's life cycle while COMB scientists explained the obstacles that had been encountered in raising the blue crabs to maturity. Since the crabs become cannibalistic during the early life stages, they

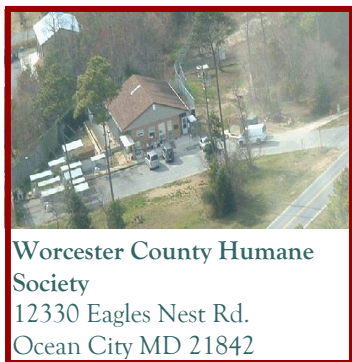


Dr. Andrea Johnson (LMSCRC) and Ms. Weezie Carrie (Stephen Decatur HS) and the ESREP students on the use of the Hach spectrophotometer.

## DNS COMMUNITY SERVICE

### Giving Back – Open Hands and Open Heart

It has often been noted that the poorest among us donate the most per capital, and the chemistry students set out to prove it. When thieves stole the dog and cat food from the Worcester Humane Society, one of our faculty rallied their troops. Jennifer Hearne set out to collect replacement food for them. The CHEM 111



students were asked to donate food for the Kennel. Between her students and Dr. Cheney's students, 1500 lbs of food were donated. Let's give Jennifer and Marcus a hand.

#### Please Spay and Neuter

Other contributions from DNS include the CHEM 101 students. They donated over 200 lbs of pet food to the Sanctuary House in Upper Fairmont. The Sanctuary House is run by the Sisters of the Community of the Ascension. For more information, call 410-621-0709.

In case anyone wants to

donate, in addition to Dog Food and Cat Food, here are the things most needed at Sanctuary House just now, especially as we get to the kitten & baby bird season:

- canned pumpkin (plain, no spices)
- canned fruit cocktail (double cherries kind is the best!)
- canned milk
- canned peas
- corn syrup (preferably in plastic, not glass ~ plain, no maple flavoring, etc.)
- canned whole corn (no creamed corn)
- dog biscuits



- paper towels
- laundry detergent

**“Thanks very much for your help!”**

### Larry Alade, Ph.D.

(cont')

quantify and forecast trends in a resource that inhabits in an elusive and dynamic environment. This was an enlightening experience and it was “that ticket” that resonated throughout the rest of my academic career and helped shape the direction of my research plans for my graduate work.

While my research plans were taking shape, I was very fortunate to have great mentors and a network of individuals that I

met either casually, during internships or through professional conferences. These were the people who kept me grounded by challenging me academically, providing guidance, and most importantly encouraging me to strive in what appeared to be an endless journey at the time.



NOAA cruise with LMSCRC students

you have to be self-motivated, I also believe my fellowship program played a major role in exposing me to people of great talents

As Ronald Azuma describes, “*Being a graduate student is like being all the seven dwarfs.*”

Although

that added a great deal of value to my dissertation work. The advantage of having mentors and a network of colleagues is that you tend to keep them beyond the life of your academic career. You just never know where you will end up. Perhaps, as a research fisheries biologist with a highly regarded federal agency?

In hindsight, my experience at the Natural Science Department can be described as a period of growth and self-discovery. Establishing strong collaborative programs such as the LMRCS was vital to my progress in graduate school. While I think course work is important in the graduate curriculum, there is nothing that can act as a substitute for practical experience outside the class-

Cont' on page 7

## Outreach Highlights (Cont')

### The Eastern Shore Restoration and Education Program Marine & Environmental Science Camp (cont' from pg 5)

must be provided with hiding spaces to escape larger crabs. Larval crabs raised in this facility have been released in the Chesapeake Bay in hopes of rebuilding the blue crab population. While at COMB, students also toured their recirculating aquaculture facility.

Between field trips and guest speakers, the students worked with their team leaders to conduct their research projects. Each of the three research groups met separately and the students selected a group name. Dr. Chigbu and Crisfield High School teacher Angela Savage organized the "Slice-N-Dicers". After collecting fish by seine net, students learned how to identify each fish, how to locate and remove the stomach and how to identify and compare gut contents between fish species.

LMRCSC doctoral student Lonnie Gonsalves, assisted by UMES graduate Bernice Bediako and Stephen Decatur Middle School science teacher Weezie Carey, led the MER"LAND"ERs. After collecting samples from waters near a housing development, golf course, marina, and in a relatively pristine area, they concluded that most nutrients and fecal coliforms were highest near the golf course.

Dr. Joseph Love and Washington High School teacher Tina Taylor led the F.I.S.H. group, which investigated species diversity as it related to landscape position. Four sites were studied. Seine nets were used to collect the aquatic life at three transects at each site. The collected fish were cataloged by species, size, and number. After examining all four sites along three transect lines, it was discovered that fish size structure varied with increasing distance from the shore.

The camp concluded with an Open House at the Sarbanes Coastal Ecology Center during which the students presented the findings of their research through posters and Power-

Point presentations. Parents, professors, and Eastern Shore Restoration and Education Program partners were invited to attend.

The camp participants gained technical knowledge in studying and evaluating their environment. They have an enhanced appreciation of coastal habitats and were able to improve their critical reasoning and investigative skills. Student evaluation forms indicated that the camp was a success, with approximately 70% of the students saying that, as a result of attending this camp, they are likely to pursue a career in an environmental field. The funding for this project was provided by a grant through the Environmental Protection Agency, by the Living Marine Resources Cooperative Science Center, National Park Service, Maryland Coastal Bays Program and Worcester County Public School System. The Eastern Shore Restoration and Education Program Director, Dr. Andrea Johnson, and Program Coordinator, Mary Phipps-Dickerson, express their thanks and appreciation to all partners and cooperators who helped make the camp a success.



Lonnie Gonsalves with High School Students in ESREP Summer Program

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"Alade " Cont' from page 6

room. The most valuable knowledge I think I have gained was through other educational opportunities, working with other graduate students, and dialoging with the best of scientists.

After almost five years in the grind, I completed my doctoral degree this past spring, and I began employment as a full-time Research Fisheries Biologist in the population dynamics branch for the Northeast Fisheries Science Cen-

ter in Woods Hole, Massachusetts. I am part of the Southern Demersal team, and I also work with the Northeast Cooperative research team to help administer various fish tagging programs. I am certainly honored to be in the position I am in today. Such an experience is certainly unbeatable in my view and I cannot think of a better way to begin one's career.

### Schedule of Events

- February 3, 2009—  
Departmental Meeting
- February 12, 2009—IACAUC  
Training meeting

# February 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3 <i>Dept Meeting</i>	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

### Schedule of Events

- March 3, 2009- Departmental Meeting
- March 9 to 13, 2009—Midterm Exams
- March 13, 2009 – Midterm Lab grades posted in Blackboard for Instructors. Attendance dates noted in dated columns.
- March 12, 2009—IACAUC meeting
- March 16 to 20, 2009—Spring Break faculty and students
- March 18 to 20, 2009—Mandatory Furlough Faculty
- March 20, 2009—Midterm grades to Registrar

# March 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### Schedule of Events

- April 7, 2009– Departmental Meeting
- April 10, 2009—Course Withdrawal Period Ends
- April 17, 2009– Registration and Payment Ends
- April 27, 2009– Student Evaluation of Instruction Week

## April 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

### Schedule of Events

- May 1, 2009– Last Day of Class for Graduating Seniors
- May 4 to 6, 2009– Graduating Senior Exams
- May 5, 2009—Departmental Meeting
- May 7, 2009—Graduating Senior Grades Due
- May 12, 2009– Last Day of Class All Students
- May 12, 2009– Last Day to Withdraw from University
- May 14, 2009—IACAUC meeting
- May 13 to 20, 2009– All Students Final Exams
- May 22, 2009– All Student-grades are due to PeopleSoft
- May 22, 2009—End of 9 month Contracts

## May 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

## Training in the Department of Natural Sciences

Laboratory, Research, Safety, Hazardous Materials, Emergency Response, Blackboard, Animal Care, Human Experiments, Teaching Effectiveness, Grantsmanship, Equipment Maintenance and Operation

### **Laboratory Training:**

The Biology and Physical Science groups (Maryam Taabodi and Amelia Potter) conducted a two day lab instructor's workshop. Dr. Ruby taught the teaching effectiveness, and Kaye Pinhey taught the Blackboard session. Ten graduate students attended. Each laboratory section in both Biology and Physical Science will utilize Blackboard for Safety Training and for Grades and Attendance Reporting.

### **Safety /Hazardous Materials Training:**

The HCP trainers (UMES and DNS) will hold a training session on Friday, February 20, to train new employees in Hazardous Materials and Right-to-Know.

### **Emergency Response Training:**

A make-up session is planned for all DNS faculty, staff and students for one Tuesday UMES hour to comply with UMES' Emergency Response guideline.

GC/MS/ICP/IC/HPLC/MALDI

Training is tentatively scheduled for Summer and Winter terms.



CONTEST CONTINUES

DESIGN A LOGO  
FOR DNS  
COMPETITION

**THE GRAND PRIZE WINNER** receives  
\$

**an expense paid research trip to a scientific conference (within the Continental United States) of their choice to present their research (poster or oral) at the conference. Package includes airfare, conference registration, conference sponsored hotel accommodations and per diem.**

We are waiting on YOUR entry!

**To enter, obtain a form from the DNS office. Complete the form and attach your color entry. Submit your entry and color copy to [klcorbin@umes.edu](mailto:klcorbin@umes.edu). WINNER will be announced in the MAY DNS Newsletter**

Sponsored by the Department of Natural Sciences Publications Committee

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**Objectives of the Department**

- Provide students with academic curricula to develop a strong understanding of basic science.
- Prepare students to be adaptable to new developments in science.
- Train students to conduct scientific research through example, mentoring and personal experience.
- Prepare students for employment in newly evolving and conventional scientific fields related to their majors.
- Expose students to social, historical, and ethical issues through the science curricula.
- Promote faculty development to accomplish the objectives of the department.
- Promote interaction between the university and community through faculty and students in the department.

