

Maryland Sea Grant Schools Network News

Vol. 3, No. 1, 2000-01



Feature Article:
Summer 2000 Professional
Development in Review



Welcome Back !
We hope everyone enjoyed the summer. In this issue we wanted to share with you how some other teachers spent their summer.

Aquaculture in Action July 10-14, 2000

The second Aquaculture in Action workshop was "on the road" again, July 10-14, at the University of Maryland Center for Environmental Science Horn Point Laboratory (HPL), The University of Maryland Biotechnology Institute's Center of Marine Biotechnology (COMB), and South Carroll High School in Carroll County, MD, and was attended by 15 educators from 8 counties in Maryland. For the first time the workshop extended into the elementary level with participation from a team of teachers from Calvert County, MD. Each participant or team of participants was supplied with materials to construct a 210 gallon recirculating aquaculture system that will be used to enhance science education in their school. Aquaculture has provided a great "hook" for teaching science for Bob Foor-Hogue at South Carroll High School, and by hosting a part of the workshop in his classroom, educators were able to get first-hand knowledge of the potential applications for themselves. The week was full of "hands-on" experiences, guest speakers, new experiences, field work, visits to aquaculture research facilities, and much more.

The workshop kicked off at HPL with a background discussion from Maryland Sea Grant Extension Agent Don Webster. His talk presented the past, present, and future of aquaculture in Maryland and abroad. Participants toured the finfish and shellfish hatcheries, competed in a shellbagging contest against 7th grade volunteers, took oyster samples in HPL's oyster nursery ground, and finished the day with a traditional Eastern Shore crab cake dinner.

Day two of the workshop started with a trip to COMB in Baltimore where John Stubblefield gave participants a "behind the scenes" look at an urban aquaculture center and current research at the Aquaculture Research Center. After lunch in Little Italy, it was off to South Carrol High School for an introduction to the 210-gallon recirculating system that each participant would be constructing for their classroom.

...continued on page 2.





The remaining days were packed full of lectures and labs on BIOFILTRATION, WATER QUALITY, MICROBIOLOGY, and ENVIRONMENTAL ASSESSMENT. Participants also heard a special talk from Kerri Bentkowski of the Chesapeake Bay Trust on how to write grants for environmental-based school projects.



If all of that wasn't enough, the portion of the workshop enjoyed the most was the construction of each participants' 210-gallon recirculating aquaculture system. These systems were composed of a rearing tank (with window), sump tank, clear fluidized bed filter, and all the accessories necessary to raise fish. In total 11 new systems were constructed for use in Maryland public schools. Some of the systems (along with supporting classroom materials) will join others in classrooms already, and the remainder will be first-time attempts at aquaculture in the school - let alone the classroom.

One strength of the workshop came from our two master teachers, Bob Foor-Hogue and Jim Gilford, both of Carroll County, who shared their years of classroom aquaculture experience with the group. They, coupled with the 10 teachers/schools that participated in the program in 1998, provide vast opportunities for partnerships between schools that would not normally interact with one another.

These teachers will now join the group from 1998 as part of the Aquaculture in Action web network, a site devoted to the support of data collection and communication between teachers and students using aquaculture in their classroom. For more information on aquaculture in the classroom or to contact an educator in your area who is using aquaculture in their classroom, check out the network at:

www.mdsg.umd.edu/Education/AinA

Historical Ecology of the Chesapeake Bay June - July, 2000

This past summer, 11 educators took part in a unique course that brought together the fields of environmental science, marine ecology, history, and archaeology. *The Historical Ecology of the Chesapeake Bay: The Chesapeake Watershed* was an 11-day hands-on field course sponsored by the Solomons Environmental and Archeological Research Consortium, Maryland Sea Grant, and the Chesapeake Biological Laboratory.

What made this program so unique was the diversity of material and expertise provided to each participant from the various research institutions in Southern Maryland. As part of their experience, teachers:

- explored the geological history of the Chesapeake Bay while aboard the R.V. Aquarius and learned about the historical oyster fishery at the *Calvert Marine Museum*;

- participated in a research cruise aboard the R.V. Aquarius and were introduced to environmental chemistry and fisheries science and management at the *Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science*;

- examined pollen cores, floral samples, animal remains, historical maps, aerial photographs and other evidence to assess historical environmental changes at *Historic St. Mary's City*;

- became acquainted with the use of biological indicators for monitoring water quality while aboard a skipjack with *St. Mary's College of Maryland*;

- examined historic landscapes and worked on an archaeological site at *Jefferson Patterson Park and Museum of the Maryland Historical Trust*;

- studied the biology of the oyster and blue crab at *The Academy of Natural Sciences Estuarine Research Center*;

- and became active participants in oyster restoration activities at the *Department of Natural Resources, Piney Point Oyster Nursery*.



Dr. Robert Paul of St. Mary's College explains the St. Mary's River Project while aboard the Skipjack *The Dee of St. Mary's*.

MSGSNN

The intent of this course was to provide educators with a solid background (historically and ecologically) on Chesapeake Bay for incorporation into their classrooms. In doing such, the course was developed and funded in such a way that:

- Course content and activities were integrated to MSDE Core Learning Goals and Learning Objectives;
- Materials, Supplies and Teaching Media needed to replicate various lab activities in the classroom were provided;
- Numerous books and videos were provided;
- as well as 2 Graduate or MSDE Credits were awarded.

As part of the credit requirement for the course, each participant was to prepare a lesson/activity integrating course materials/concepts for application in the classroom. A final presentation of these lessons is scheduled for September 30th. Look for highlights of these lessons in up-coming issues.

Microbes for Hire

August 7-11, 2000

This summer, 20 Maryland middle and high school science teachers attended the Microbes for Hire Workshop at the Center of Marine Biotechnology (COMB). The *Microbes for Hire* Workshop, sponsored by the Pfizer Foundation, The Foundation for Microbiology, and Bell Atlantic-Maryland, is designed to translate the applied microbial research at COMB into laboratory activities for teachers and students in Maryland. Teachers gained applied laboratory skills and enhanced content knowledge on topics including:

- *Bioremediation and the Effectiveness of Biosurfactants*
- *Bioluminescence and the Application of Biosensors*
- *Bacteria and Their Relationships in the Marine Environment*
- *Bacterial Biofilms and Their Relationship to Biodiversity*
- *Microbial Screening Techniques for Identifying Bioactive Compounds*
- *The Science of Winogradsky Columns and Marine Sediment*
- *The Role of Bacterial Biofilms in Biological Filtration for Aquaculture*
- *Digital Imaging and Microscopy in the Classroom, The QX3 Computer Microscope by Intel*
- *Microbes on the Web*

Each topic was presented by a COMB scientist or graduate student to provide the essential background of the research and was followed-up by a "hands-on" lab that exposed teachers to new techniques, laboratory materials, and ideas

for their classroom. Teachers were given the opportunity to design experiments and test out new techniques as a means of assessment and preparation for classroom follow-up. In addition, teachers were supplied with materials required for successful implementation of each lab activity within their classroom.

The simplicity of each lab and the translation of the COMB research were the key features of the Microbes for Hire workshop. The workshop enabled teachers to gain access to new techniques for studying a vital portion of the environment and interact with graduate students and scientists in a world class research setting, the Center of Marine Biotechnology. Teachers left the workshop with a greater understanding of the role of microbes in the environment and how researchers study and develop applied techniques using microbes to better enhance our society on a wide variety of fronts from solving pollution problems to developing new medicine. In addition, teachers will return to the classroom with new activities and lab materials to excite and engage their students in the coming school year.

The methods of instruction range from simple and safe microbial lab techniques to web-based interactive lessons based on academic laboratory research.

The summer workshop will be followed by an after school Microbes for Hire workshop series during the 2000-2001 academic year focusing on participation from Baltimore City Public Schools System science teachers. The goal is to enroll 20 new teachers each semester in the Microbes for Hire after school program leading up to the summer of 2001 workshop.



A set of winogradsky columns prepared with raw eggs, newspaper, and muck. The nutrients will stimulate the growth of anaerobic organisms that will result in the display of colorful colonies of bacteria along the sides of the tubes.



Chesapeake Bay Foundation Launches Maryland Bay Schools Project

The Chesapeake Bay Foundation (CBF) has selected nine Maryland schools as partners in the pilot phase of the Bay Schools Project, an innovative environmental education program that will use the environment to help improve academic achievement, school behaviors, and environmental stewardship.

The Bay Schools Project is part of a national effort to encourage schools to use the environment as an "integrating context for learning." In a nation-wide study of schools that had woven the environment through their curricula in a similar manner, the State Education and Environment Roundtable found that using the environment had a positive impact on a wide array of variables, including academics, student interest in learning, and attendance.

The schools selected include four elementary schools, two middle schools, two high schools, and one private school, and represent diverse economic, social, and geographical regions throughout the state. The schools are Perry Hall Elementary School (Baltimore County); North Bend Elementary School (Harford County); Morrell Park Elementary/Middle School (Baltimore City); Hollywood Elementary School (St. Mary's County); Forest Oak Middle School (Montgomery County); Bohemia Manor Middle School (Cecil County); Northern High School (Baltimore City); Broadneck High School (Anne Arundel County); and the Key School (private, Anne Arundel County).

"The Bay Schools Project will bring meaningful, sustained Bay education to a diverse audience of students and teachers," said CBF Vice President for Education Don Baugh. "We believe that using the local environment as the theme for learning can improve students' academic success and encourage them to take positive action toward the protection and restoration of Maryland's watershed."

After extensive research, a CBF Bay Schools Project committee selected the partner schools based on, but not limited to, teacher and administrative commitment, the school's vision for the project, site and scheduling possibilities to accommodate project-based learning, and geographic and demographic range.

Bay Schools project coordinators, three experienced educators hired by CBF, will serve as direct liaisons between CBF and the partner schools to support and assist each school. A steering committee composed of the principals from each school and several lead teachers will help provide guidance to the Bay Schools Project team. A steering committee of students from each school will also meet to help CBF document the impact of the Bay Schools Project on students.

In addition to helping the schools weave the environment into their classroom curricula, CBF will also offer the schools up to 20 days of field trips on the Bay and local tributaries. CBF's field-based education program takes more than 37,000 students and teachers out in the Bay watershed each year, and has received national recognition and awards.

"We are confident that this project will have a dramatic impact on the long-term health of the Bay, as well as on students' achievement in school," said CBF's Jessica Bearman, who directs the Bay Schools Project. "CBF can help develop citizens who think critically about choices, consider different perspectives, and develop positive solutions to problems in the real world."

"Although CBF was the catalyst for this project," added Bearman, "a varied and influential mix of partners and project advisors has helped to ensure that the Bay Schools Project is solidly grounded in the actual needs of school systems."

CBF will launch the Bay Schools Project this summer with 10 days of professional development for each school, including a Chesapeake Bay immersion course and a summit that will bring environmental education experts from around the country and state to share their knowledge and help schools plan for the upcoming year.

For more information about CBF's Bay Schools project, contact David Slater at 410-268-7742, ext. 811.



Educator



John Wilkins

Archbishop Carroll High School
Washington, DC

"Up Close"

John spent his summer expanding his knowledge of aquaculture and microbial ecology by attending the Aquaculture in Action and Microbe for Hire workshops.

Degree: Bachelors degree in Marine and Environmental Science from Hampton University, Virginia.

Experience: John has been at Archbishop Carrol High School since 1999, and also works at the US EPA's Office of Pollution Prevention.

John brings 5 years of outside experience to his classroom - he has interned at the US EPA's Office of Environmental Justice and the Center of Marine Biotechnology, worked as a part-time lab assistant at Hampton University's Marine Science Lab, worked for Dr. Adey of the Smithsonian Museum of Natural History in the florida Everglades mesocosm, worked as a technician/water quality analyst at the Fairfax County Water Quality Lab, and worked as an environmental policy analyst/environmental scientist at HAZMED, Inc.

Subjects: Aquatic Science, General Biology, Environmental Science

"Most Memorable" Teaching Experience: The elation I felt when I saw how interested and happy my students were when I took them on a trip to the Chesapeake Biological Laboratory.

Favorite Class Trips: The National Aquarium, The Chesapeake Biological Laboratory, and our Stream and Marsh studies.

Awards and Grants: US EPA Fellowship Award.

Teaching Techniques: Hands - on.

Future Plans: To persue a masters degree or possibly a Ph.D. in fisheries ecology.

Maryland ROW's

The River of Words Project is an international environmental poetry and art contest designed to nurture respect and understanding of the natural world by encouraging children to learn their "ecological address" and to describe through poetry and art their own "place in space." Co-sponsored by International Rivers Network, The Library of Congress Center for the Book and United States Poet Laureate (1995-1997) Robert Hass, the project hopes to foster responsibility, imagination and action in young people and to publicly acknowledge their creativity and concerns.

Maryland Department of Natural Resources recently adopted River of Words (Jan 2000) as an extension of Project WET Maryland (Water Education for Teachers). Each year 8 National Grand Prize winners (4 in poetry and 4 in art) and

one international winner will be chosen to go to Washington, DC with their parents, where they will be honored at an award ceremony, luncheon, public reading and art show at The Library of Congress. River of Words also honors a "Teacher of the Year" and a San Francisco Bay Area and a Washington, DC Area winner annually. MD DNR hopes to follow the national contest with a statewide judging during the summer.

For additional information contact:
Maryland River of Words Coordinator
Catherine Felker
Maryland Department of Natural Resources
Aquatic Resources Education
580 Taylor Avenue, E-2
Annapolis, MD 21401
410-260-8723
cfelker@dnr.state.md.us





Program



SciTech Education Program

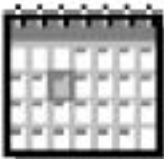
U of MD Biotechnology Institute 2000 - 2001
 Sea Grant Extension Program Schedule

"Up Close"

The University of Maryland Biotechnology Institute (UMBI) and Maryland Sea Grant Extension Program are offering unique lab-based experiences for high school students in the Columbus Center in Baltimore, MD. The SciTech Education Program focuses on translating the research at UMBI into "hands-on" experiences for students. The SciTech labs are equipped with a wide variety of technical equipment that provide students and teachers with many "first-time" opportunities. Featured are the Olympus research microscopes that enable students and teachers to capture video and images of their experience to take back to the classroom and use for follow-up projects in school (be sure to bring a blank VHS tape and MAC or PC floppy disks). The SciTech Education Program also includes a seminar with a scientist from UMBI so students can learn about careers and choices in the science field.

The content of the lab experiences integrates a variety of disciplines and relates to societal concerns that are easy for students to grasp. This year the SciTech Education Program is offering eight lab-based experiences:

- | | | |
|-----------|--|--|
| Sept-Oct: | Biofilms & Biodiversity | |
| Nov: | Natural Products & Biosensors | |
| Dec: | Zebrafish Embryology | |
| Jan: | Oil Pollution: A Soapy Solution | |
| Feb: | DNA Extraction Lab | |
| March: | Oysters | |
| April: | Plankton in the Bay | To receive more information about these and other programs call (410) 576-5778 or check them out on the web at http://www.umbi.umd.edu/~scitech |
| May: | Biofilms & Biodiversity | |



Coastal Books for Kids

Seashore naturalist, Larry Points has co-authored three children's nature books about Assateague Island's wild ponies, Atlantic Coast beaches, and barrier island birds. Each soft cover book consists of 32 pages loaded with several dozen full color photographs.

Assateague - Island of the Wild Ponies
 Readers of all ages will enjoy the unique photos and learning about the social behavior and natural history of these animals as they go about a year of their life.

Ribbons of Sand - Exploring Atlantic Beaches
 Ribbons of sand looks at the beauty of beaches along the East and Gulf Coasts. Subjects include sand, seashore plants and animals, and beach-combing objects which are of common interest to children and their families.

Barrier Islands are for the Birds
 From ocean beaches to salt marsh bays, Atlantic barrier islands have interesting habitats that are home to many resident and migratory birds.

Teachers may be interested in a future visit by Mr. Points to their school, or in an opportunity for their students to obtain discounted copies of signed books. An order form will allow anyone to obtain a signed copy with a personal message to the recipient from the author.

To learn more about the books visit www.seacritters.com.

Professional

September 23, 2000	October 6-8, 2000	October 17-21, 2000	November 16-18, 2000
Maryland Assoc. of Biology Teachers	Mid-Atlantic Marine Education Assoc.	North American Assoc. for Environmental Education	National Science Teachers Assoc.
Fall Conference Hood College, Maryland	Annual Conference Baltimore, Maryland	29th Annual Conference Spanning Cultural and Ecological Diversity South Padre Island	Eastern Area Convention Baltimore, Maryland
http://www.life.umd.edu/mabt/	www.vims.edu/adv/mamea	www.naaee.org	www.nsta.org



Chesapeake Bay Foundation Opportunities for Teachers

Student Oyster Corps - teachers and students attend a CBF workshop, build an oyster raising float, receive interdisciplinary classroom curriculum and education resources, and can attend a field trip to plant their oysters.

Fall Workshops: September 20th - Annapolis area
September 26th - Baltimore area
September 28th - Eastern Shore
October 4th - Southern Maryland

For more information or to register for a workshop contact:
John Rodenhausen at 800-445-5572 or jrodenhausen@cbf.org

Bay Grass Seed Nurseries - We are looking for a few schools with greenhousetype facilities to construct and maintain a Bay Grass (SAV) seed nursery, growing Wild Celery and Red Head grass from September - May collecting seed and growing plants for transplanting. This projects will help supply seed for other schools and volunteers participating in the Bay Grasses in Classes project.

For more information contact:
Jamie Baxter at 888-445-5572 or jbaxter@cbf.org

Bay Grasses in Classes - Teachers attend a workshop and receive all the necessary equipment, seed and curriculum materials to grow underwater grasses in the classroom. This project, a partnership with the MD DNR has involved over 4000 students to date in the hands-on restoration of Bay Grasses to their local rivers and Bays.

For more information or to sign up for **Spring** workshops contact:
John Rodenhausen at 888.445.5572 or jrodenhausen@cbf.org

WE WANT TO HEAR FROM YOU!!

The editors would like to know what interests you. This will give us an idea of what YOU as Maryland educators want and need. So take a few minutes and drop us a note or e-mail.

(Please indicate preference 1=most, 5=least)

Which Critter Would You Like To Know More About?

- _____ Blue Crab
- _____ Jellyfish/Sea Nettle
- _____ Diamondback Terrapin
- _____ Other _____

What Would You Like To See?

- _____ Factsheet Information
- _____ Classroom Activity
- _____ Web-based Activity
- _____ Field-trip Information
- _____ Other _____

Other Thoughts?

Mail your response to Jackie Takacs, P.O. Box 38,
Solomons, MD 20688

Or Go On-line at www.mdsg.umd.edu/Extension/msgsnn
and email your response.

Calendar

February 2-4, 2001

Maryland Assoc. for Environmental
and Outdoor Education

16th Annual Conference
Environmental Education:
A Dynamic Tool for Change
Ocean City, Maryland

www.maeoe.org

July 17-21, 2001

National Marine Educators Assoc.

NMEA 2001:
A Water Odyssey
British Columbia

www.marine-ed.org

October 11-15, 2001

North American Assoc.
for Environmental Education

30th Annual Conference
Exploring Capacity, Community, Complexity
and Culture
Little Rock, Arkansas

www.naaee.org



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Name: _____ School: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-mail: _____

Grade Level: _____ Courses Taught: _____

Sign Me Up! Change My Address! I Want to Submit!

Maryland Sea Grant Schools Network News
Volume 3, Number 1
2000 - 2001

Maryland Sea Grant Schools Network News is published four times a year by the Maryland Sea Grant Extension Program for and about the education community around the state.

This newsletter is produced and funded by the Maryland Sea Grant Extension Program with receives support from Maryland Cooperative Extension, Maryland Sea Grant College, University of Maryland Center for Environmental Science, and the National Oceanic and Atmospheric Administration. Managing Editors, J. Adam Frederick and Jacqueline U. Takacs. Send items for the newsletter to:

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For more information about Maryland Sea Grant, visit our web site:
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