

Maryland Sea Grant Schools Network News



Feature Article: Aquaculture in Action Workshop, July 1998

Vol. 1, No. 1, 1998-99

As population growth continues to increase throughout the Chesapeake Bay watershed, the challenges facing restoration will continue to increase as well. While research will be critical to help us understand complex ecological processes, particularly the impact of human activities, and to provide information that can be adopted for natural resource management, science alone will not lead to sustaining the restoration of the Bay or any ecosystem. If there is a key, it is education - education of the young scientists and engineers who will be responsible for the next generation of coastal-based research; education of specialist to work in marine-related fields; and education of our citizens who must have the scientific knowledge to make reasoned choices that will influence environmental decision making. -1999 Maryland Sea Grant Program Directory

If there is a key ... it is education.



The Maryland Sea Grant Program serves the citizens of Maryland by developing innovative outreach programs that bring University-based research to bear on concerns related to Chesapeake Bay. It is supported by a staff of specialists in the following areas: finfish and biotechnology, shellfish, water quality, economics, seafood technology, education, policy, and communications.

New Publication for Maryland Educators

Introducing ...

Maryland Sea Grant Schools Network News

What is MSGSNN?

Free Quarterly Newsletter

Focusing on Local Science Education

Environmental Education

Marine Education

Research Partnerships

Restoration Programs

Information Sharing

A new way for local educators to share projects, lessons, or ideas with others through submission of articles.

Standard Features

Professional Calendar : up-to-date calendar of meetings and conferences in the area of science education.

Professional Update : listing of where to go for continuing education and professional development workshops, programs, and fellowships.

Educator Up Close : spotlight article on a local educator doing innovative programming in their classroom.

Program Up Close : spotlight article on either a professional development workshop/program, student enhancement field trip, or other organizations that provide similar programming.

Aquaculture in Action Workshop July 6-11, 1998

The Aquaculture in Action workshop was held July 6-11 at South Carroll High School and was attended by 14 educators from 8 counties in Maryland. Each participant or team of participants was supplied with materials to construct a 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 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, a surprise flood in the room, field work, a visit to the Aquaculture Research Center in Fells Point and much more.



Participants from the Aquaculture in Action Workshop pose in and around one of the 210-gallon systems that was constructed during the week. From left (kneeling at tank) - Julie Janowich, Bob Foor-Hogue, Doug Romano, Valerie Wesner. From left (standing) - Jim Gilford, Ron Albaugh, Bob Cole, Paul DeRoo, Mike Mumau, Lonnie Lewis, Paula Mitchell, Dale Johnsen, Dale Peters, and John McKenney. Missing from photo - Steve Luetette and Doug Stransky.

During the first day of the workshop, veteran educators shared experiences concerning the problems related to water and classrooms. Bob Foor-Hogue, Jim Gilford and John Dunski (workshop instructors and Carroll County science educators) each shared stories

about water overflowing, leaking, being left on over the weekend, etc., to drive the point home that accidents will happen. On the second day, the 4 inches of water on the floor on Bob Foor-Hogue's classroom made for a great visual that won't soon be forgotten.



Jim Gilford and Bob Foor-Hogue are busy swabbing the deck on Tuesday morning.

Daily guest speakers from various organizations shared their expertise with the group: Jim Ebeling from the Biological Resources Lab at University of Maryland College Park gave an overview of aquaculture and filtration system designs; stream assessment techniques were demonstrated by the Maryland Department of Natural Resources; Dr. Andy Kane from the University of Maryland Aquatic Pathobiology Lab delivered a presentation on fish health and reviewed the Fish Guts CD (funded by the National Sea Grant Office for each of the participants); David Minges from the Chesapeake Bay Trust answered questions on funding classroom projects and successful grant writing; water quality parameters and their interactions with each other were discussed by Dr. Dan Terlizzi from the Maryland Sea Grant Extension Program; and thanks to John Stubblefield, participants were able to get a "behind the scenes" look at an urban aquaculture center and current research at the Aquaculture Research Center in Fells Point.

The portion of the workshop enjoyed the most was the construction of each participants 210-gallon recirculating aquaculture system. Each educator enjoyed the hands-on approach of the workshop, in fact, at times it seemed that all that mattered was the smell of PVC primer and the sound of hole saws.

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.



Doug Romano, Julie Janowich, Dale Peters and Dale Johnsen are checking the bulkhead fitting on a 210-gallon system.

The potential uses of an aquaculture system in your classroom are only limited by the imagination. 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:

Get'er done seemed to be the unspoken motto of the group.

www.mdsg.umd.edu

or contact:

Adam Frederick
Maryland Sea Grant
410-234-8850

Jackie Takacs
Maryland Sea Grant
410-326-7356

A strength of the workshop as expressed by many of the participants was the mixture of some educators with experience in aquaculture and those with little experience. This mixture provided opportunities for partnerships between schools that would not normally interact with one another. These partnerships between schools will be expanded by the web network that will be created as a result of each completed project in the fall of 1998.



Bob Foor-Hogue and Adam Frederick stand alongside a completed 210-gallon recirculating system.

Professional Update

Horn Point Environmental Education Center

The Horn Point Laboratory and Horn Point Environmental Education Center are proud to continue their series of science workshops for secondary school educators. Research scientists, in conjunction with environmental educators, will provide workshops that are content oriented, use real world data and are geared toward Maryland's Core Learning Goals.

This year's workshops: Workshop I - Phytoplankton Production & Aquatic Ecosystems Modeling with STELLA
Dr. Raleigh Hood & John Petersen
April 1-2, 1999

Workshop II - Oyster Ecology & Aquaculture
Dr. Donald Meritt & Jacqueline Takacs
May 18-19, 1999

Registration for these workshops are \$200 per person per workshop. For a tentative agenda, dates, and a registration form please contact: Cathy Baptist, Horn Point Lab, 2020 Horn Point Rd., Cambridge, MD 21613, 410-221-8452, baptist@hpl.umces.edu

Educator



Bob Foor-Hogue
South Carroll High School

"Up Close"

Picture an empty Vo-Tech shop. Now add about 9 recirculating aquaculture systems of various sizes containing approximately 3,000 gallons of water used for raising a variety of fish, a workshop, a wind tunnel, a computer lab/classroom and a small office. Now picture yourself teaching students in an environment like this. Distracting? Not if the students are actively involved in the design, construction, maintenance, research, trouble-shooting, grant writing and application of some, or all of these pieces, to enhance critical thinking and problem solving.

For the past 13 years, Bob Foor-Hogue has been motivating students at South Carroll HS, and other educators around Maryland, with his brand of science instruction that can best be described as "organized chaos" in a course partly designed by him entitled Science Research. The focus in his classroom is not biology, chemistry, environmental science, physics or technology, it is students. The students are the ones who will ultimately decide what their focus will be and become responsible for the research, development, and implementation of their ideas. When the bell rings at the start of each class, students go straight to work - completely by-passing the traditional be-in-your-seat-when-the-bell-rings and-we'll-start-with-a-warm-up approach.

Last year Mr. Foor-Hogue was the Maryland Teacher of the Year and has contributed significantly to the development of improved science instruction in Maryland by opening his doors to any educator who may want to drop by his classroom for a visit. This has enabled other counties to adopt the Science Research philosophy and implement courses this Fall for the first time.

While periodicals and newspapers are full of science education reform articles and new approaches for developing critical thinking skills, we should all take some time to recognize the excellence in education in our own community - great things are happening.

Oh, by the way, Mr. Foor-Hogue is giving evening seminars for all the Towson University student teachers assigned to Carroll County.

Educator "Up Close" Candidates

Do you know someone that would be a good candidate for the "Up Close" column? If so, send us some information and we would be glad to look it over. Thanks.

Program



SciTech

Center of Marine Biotechnology
Sea Grant Extension Program

"Up Close"

The University of Maryland Biotechnology Institute's Center of Marine Biotechnology (COMB) 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 the Center of Marine Biotechnology 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 COMB so students can learn about careers and choices in the science field.

The content of the lab experiences integrate a variety of disciplines and relate to societal concerns that are easy for students to grasp. This fall the SciTech Education Program is offering three lab-based experiences:

Biofilms and Biodiversity
Zebrafish Embryology
Pharmaceutical Extractions

To receive more information about these and other programs call (410) 576-5778.

A Focus on Chesapeake Bay

A focus on Chesapeake Bay was the theme of the Maryland Association of Biology Teachers (MABT) spring meeting. Hosted this past April by MABT and Maryland Sea Grant, the day promised to provide educators with the information and resources they would need to enhance themselves, their students and their classrooms in the continued study of Chesapeake Bay.

Participants were welcomed that morning by Dr. Chris D'Elia, Director of Maryland Sea Grant, who emphasized Sea Grant's commitment to education and local educators. What followed was a viewing of *Alien Ocean*, a 30-minute video telling the story of those scientists and watermen who are pioneering their way through a new field of science - invasion ecology. Copies of the video were available that day to educators at a reduced price of \$5.00 - a \$24.95 production that can be purchased from Maryland Sea Grant.



Michael Fincham, Maryland Sea Grant, who produced, directed and edited *Alien Ocean*, takes time to discuss the issues of foreign species invasion within Chesapeake Bay.

During the remainder of the morning participants were given the opportunity to attend two of three sets of concurrent sessions. Because these sessions were so well received and full of information and opportunities that we believe every educator should know about - we are providing a summary of each with contact and web addresses.

Professional Development

*Horn Point Laboratory, Center
for Environmental Science,
University of Maryland*

Offers day-and-a-half workshops during the school year designed to bring current research (as lab and/or field experiences) to the classroom, and week-long summer workshop in the areas of watershed issues, wetlands ecology and Chesapeake Bay ecology.

For more information contact:

Dr. Laura Murray
HPL/UMCES
P.O. Box 775
Cambridge, Md 21613
410-228-8200

or check them out on the web at www.hpl.umces.edu/education/education.html for more information on facilities, resources and field trip opportunities and ideas.

Chesapeake Bay Foundation

Offers two-day educator training during the school year on their programs *Your Watershed* and *The Bay and The Catch of the Bay*, and sponsors over 20 summer programs throughout the Bay watershed.

For more information contact:

Erin O'Neal
CBF
162 Prince Georges St.
Annapolis, MD 21401
410-268-7742

or check them out on the web at www.savethebay.cbf.org for more information on workshop dates and field trip opportunities and ideas.

University of Maryland Graduate Fellows Program

Summer internship program that places middle and high school educators at one of over two dozen participating Maryland research sites where they work directly with scientists on real-world projects in disciplines ranging from biotechnology, astronomy, and environmental research, to agriculture, oceanography, atmospheric science, and genetics.

For more information contact:

Elizabeth Jones
UMBC Continuing Ed.
1000 Hilltop Circle
Baltimore, MD 21250
410-455-2680

or check them out on the web at www.umbc.edu/umgfp.

Space Grant / NASA

Currently offers two programs: 8-week summer internships at space camp; and 2-6 month, 1 day/week graduate courses working with realtime satellite data.

For more information contact:

Bob Popham
4810 N. Reyburn Ct.
Mt. Airy, MD 21771
310-865-5151

Field Trip Experiences

Living Classrooms Foundation

Programs range in length from one day youth group expeditions aboard one of the foundation's four ships, to extended land/sea expeditions that explore the socioeconomic history of the Chesapeake Bay region, to year-long job training programs with high school credit at the Living Classrooms Maritime Institute.

The Foundation's interdisciplinary shipboard and land-based programs emphasize applied learning of academics, career training, and life skills.

For more information contact:

Living Classrooms
Foundation
802 South Caroline St.
Baltimore, MD 21231
410-685-0295

or check them out on the web at www.livingclassrooms.org for more information on facilities and field trip opportunities.

Academy of Natural Sciences Estuarine Research Center

The Center offers exposure to ongoing, cutting-edge interdisciplinary scientific research through a variety of education and outreach experiences. Program participants have the opportunity to observe first-hand what the Center's scientists do, to learn why it is important, and to experience how it is done.

Education and outreach experiences are available by appointment for adults and students. The Center's staff offers tours, presentations, workshops, and field sessions for local community groups, educators, and students in middle school, high school, and college. Program content is arranged in advance through consultation with the Center's Education Coordinator and is individually tailored to fit the needs of each group based upon age, knowledge, and level of interest.

For more information contact:

Education Coordinator
ANSERC
10545 Mackall Rd.
St. Leonard, MD 20685
410-586-9700

or check them out on the web at www.anserc.org for information on education programs, tours, presentations, or to receive their newsletter.

Smithsonian Environmental Research Center

Offers several ecological K-12 programs that include boating, canoeing, estuary programs, and other exciting learning events.

Some programs do require pre-visit training for educators.

For more information contact:

Mark Haddon
Education Director
410-798-4424 x 218

or check them out on the web at www.serc.si.edu/ed_webpage/pages/education_index.html for more information on facilities, resources, educator workshops, and field trip opportunities and ideas.

Funding the Science Classroom

Maryland Department of Natural Resources - Aquatic Resources Education Grants

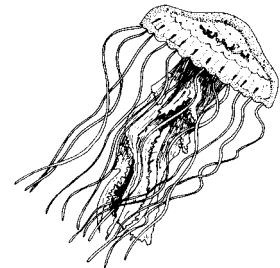
Provides financial support for educators to design projects which equip their students to make educated choices concerning the aquatic resources. Projects can be designed for classroom, laboratory, or field experiences. Particular emphasis is placed on selecting projects which actually improve or enhance Maryland's aquatic resources and those that include student involvement from start to finish.

Grants are accepted year round and cannot exceed \$4,000 for city and county school systems, or \$1000 for each school.

For more information contact:

Cindy Grove
DNR Conservation Ed.
580 Taylor Ave,
Tawes E-2
Annapolis, MD 21401
410-260-8710

or check them out on the web at www.dnr.state.md.us/education/educators.html for more information about the aquatic resource education grants, field trips, or professional development opportunities.



MSSA Master Teacher Grants

Facilitates the request, review, and implementation of grants that provide examples of lessons that focus on the Core Learning Goals.

\$500 grants available from the Maryland Science Supervisors Association (MSSA) - mvhsl.mbhs.edu/mmssc/home/mssa/start.htm

\$500 grants available from BGE energy mini-grant program - www.bge.com/newsinfo/edures/

\$500 grants available from Maryland Association of Science Teachers - mast.walkersville.fr.k12.md.us/

Maryland Educational Incentive Fund (MEIF)

State grant for help in supplementing equipment for science and math classes. Equipment must be non-consumables and do not have to be big ticket items. There is a requirement of "matching funds" (i.e., these can be funds raised from the community or other organizations). Partnerships between state, school, and private sector are encouraged.

\$12,000/school system

For more information contact:
Rich Chirumbole
MSDE, Baltimore St.
Baltimore, MD 21202

Chesapeake Bay Trust

Provides financial support grants to civic and community organizations, schools, and volunteer groups for Chesapeake Bay restoration and education projects in Maryland. The

Trust favors action-oriented activities. Projects that unite business, government, and citizen groups in activities which contribute to the restoration and protection of the Bay are encouraged. Priority is given to two principle areas: education projects that promote a behavior change toward the Bay and the performance of restoration activities that utilize volunteers. Efforts to raise "matching funds" is encouraged but not required.

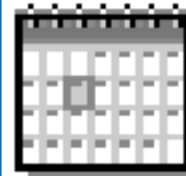
Grants are accepted year round. Requests of \$1000 or less are accepted at any time and are considered within 30 days, requests over \$1000 are reviewed quarterly.

For more information contact:
Dave Minges
60 West St., Suite 200A
Annapolis, MD 21401
410-974-2941

or check them out on the web at:
www2.ari.net/home/cbt.



Students and teachers at work in the SciTech Education Lab at The Center of Marine Biotechnology.



Professional Calendar

October 16-18, 1998
MAMEA (Mid-Atlantic Marine Education Association) Conference
Virginia Beach, Virginia
www.vims.edu/adv/mamea

October 23, 1998
MAST (Maryland Association of Science Teachers) Conference
Urbana High School
Urbana, Maryland
mast.walkersville.fr.k12.md.us

January 29-31, 1999
MAEOE (Maryland Association of Environmental and Outdoor Educators) Conference
Ocean City, Maryland

March 18-19, 1999
MSDE Eisenhower Science and Mathematics Conference
BWI Marriott
Baltimore, Maryland

August 6-11, 1999
NMEA (National Marine Educators Association) 23rd Annual Conference.
Exploring our Coastal Heritage
Charleston, South Carolina

MSGSNN

MSGSNN Sign Up / Change of Address Form / Article Submission

The Maryland Sea Grant Schools Network News is published by the Maryland Sea Grant Extension Program, University of Maryland as a service to Maryland science educators. If you would like to be added to the mailing list, need to change your address, or would like to receive an article submission form, please fill out this form and mail it to: MSGSNN, Jackie Takacs, Chesapeake Biological Laboratory, Solomons, MD 20688.

Name: _____ School: _____

Address: _____

Phone: _____ Email: _____

Grade Level: _____ Courses Taught: _____

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