

# Flotsam & Jetsam

A Newsletter for Massachusetts Marine Educators

Spring 2003

www.massmarineeducators.org

Vol. 32, No. 3

## President's Message



*MME President Howard Dimmick of Simmons College and President-Elect Linda McIntosh, Dana Hall School, who will become President at the WHOI Conference this year.*

**We will weather the storm together...**

Again teachers are being asked to shoulder the burden of larger classes, missing teaching assistants, missing supplies, and more fees for various activities. We will weather this storm, perhaps somewhat battered and bruised, as we continue to serve the students in front of us.

As some of us retire, or near retiring, I am asking that each person prepare one of your favorite lessons in marine science education to be posted on our web site. We have a section there for curriculum, which at the present time has only the current tide charts for Massachusetts on it. (I am working on the tried and true tide chart activity and should have it ready to post early in April). If each of you would write up your favorite activity, and email it to me ([dimmick@stoneham.mec.edu](mailto:dimmick@stoneham.mec.edu)). I will prepare it to be

*continued on page 3*

## Ocean Science is For Everyone!



MME's 27th annual Marine Science Conference will be held on May 3rd at the Woods Hole Oceanographic Institution. The schedule for this popular conference will include fascinating talks by Dr. Michael J. Moore on right whales, Dr. Sonya Dyrhman on harmful algal blooms, and Dr. Kara Lavender on global ocean circulation.

In addition, the annual meeting, including biannual elections, door prizes, raffle, and awards ceremony will be held in the morning, and workshops and field trips in the afternoon.

Field trips and workshops are on topics ranging from shipwrecks on Stellwagen Banks, COSEE and the teacher, fish identification, a whale mystery, design, building, and flying your own ROVs, and more!

Check out MME's WHOI web pages for information about the awards, book awards, Crowley scholarships and teacher grants, and annual awards. Check the Calendar section of this newsletter on page 3 for contact and registration information.

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## Topics in Oceanography: Educators Training Workshop

On Friday, May 2, WHOI Sea Grant will hold its third annual teacher workshop at the Exhibit Center. This workshop was a great success in past years, so sign up early to reserve your place for this special event. Contact Stephanie Murphy ([samurphy@whoi.edu](mailto:samurphy@whoi.edu)) 508/ 289-2271 or Tracey Crago ([tcrago@whoi.edu](mailto:tcrago@whoi.edu)) 508/ 289-2665.

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**Members Only:** Members who would like to download the complete current issue of *Flotsam and Jetsam*, from our web pages should do the following:

Under the graphic of the first page of the newsletter where it says to, click to open a new screen. After the current issue, click to download and enter the username **mme** and the password (for this year) **whale** (both words all in lower case). This will allow you to download the whole issue as a pdf.

**From the Editor....**

Estuaries is the topic of the curriculum materials in this issue. We want to thank Pat Harcourt, Community Educator of the Waquoit Bay National Marine Reserve in Waquoit, MA, for advice and information. Waquoit Bay National Estuarine Research Reserve, Massachusetts Department of Environmental Management, P.O. Box 3092, Waquoit, MA 02536, (508) 457-0495 ext. 106 phone; (617) 727-5537 fax; [pat.harcourt@state.ma.us](mailto:pat.harcourt@state.ma.us). More information is available on the Waquoit Bay National Estuarine Research Reserve website at [www.waquoitbayreserve.org](http://www.waquoitbayreserve.org). See page 4.



The North Carolina National Estuarine Research Reserve provided the curriculum materials in this issue (see pages 5-7). Many excellent lesson plans on estuaries and information about National Estuaries Day in late September 2003 are located on their attractive web site ([www.ncnerr.org](http://www.ncnerr.org)).

Because of the snowy, cold winter this year, the estuaries in Massachusetts are an interesting but stark sight. Large blocks of ice lie over the rivers and sheets of broken ice cover the top of salt marshes. The only colors are white, gray, black, and dark brown. Fiddler crabs lie deep under the mud of the banks. But spring is coming soon, and all life will once more be awakening.

**Flotsam & Jetsam**

A Newsletter for Massachusetts Marine Educators

website: [www.capecod.net/~MME](http://www.capecod.net/~MME)

*Flotsam and Jetsam* is published three times a year by the Massachusetts Marine Educators, Inc. Please submit items for the calendar, classroom projects, curriculum materials, or other information to the editor. Please submit dates for the calendar at least two months prior to the event or call the editor (617) 484-6961 (email: [barbarap@thecia.net](mailto:barbarap@thecia.net)).

Publications Officer.....Barbara Passero

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## Dive and Discover 2003 Online Expedition May 14-June 5

Join WHOI on a journey to the New England seamounts, a chain of extinct, undersea volcanoes about 500 miles off the east coast of North America. Researchers aboard the *RV Atlantis* will search for and collect deep-sea corals, whose skeletons may reveal how Earth's climate has rapidly cooled or warmed in the past. The expedition will involve 14 Alvin dives and the use of the autonomous vehicle ABE to map the seafloor. The site also features an educator's companion with activities, backgrounders, and resources. Information: Stephanie Murphy, (samurphy@whoi.edu) 508/289-2271; www.divediscover.whoi.edu.

## Farewell to Nap J. Buonaparte

We are saddened to note that Nap J. Buonaparte, a long-time MME board member, passed away in January 2003 of a heart attack. Nap served MME faithfully as chairman of the awards committee for many years. A Magnolia, MA, resident, Nap worked at the Gaebler School in Waltham, MA, before leaving several years ago to teach part-time at Milton Academy. He gave generously of his time as a volunteer for many educational and environmental organizations.

Milton Academy held a memorial service for Nap's colleagues and friends to honor his dedication to teaching on Saturday, March 8th at Strauss Hall.

MME will certainly miss his cheerful and helpful ways.

## Calendar 2003

March 19, 2003 -- 8 AM - 2 PM

**20th High School Marine Studies Symposium.** University of Massachusetts at Dartmouth. Information: Rick Schmidt, UMass Boston, 617/283-7666 (rick.schmidt@umb.edu).

March 27-30, 2003

**NSTA National Convention.** Philadelphia, PA. Information: www.nsta.org/conventions.

May 1-2, 2003

**Massachusetts Association of Science Supervisors (MASS) Conference.** Holiday Inn, Worcester, MA. Information: pquatromoni@peoplepc.com.

May 2, 2003 -- 11 AM - 5 PM

**Topics in Oceanography: Educators Training Workshop.** WHOI's Exhibit Center. Information: Stephanie Murphy (samurphy@whoi.edu) 508/289-2271 or Tracey Crago (tcrago@whoi.edu) 508/289-2665.

May 3, 2003 -- 8:30 AM - 6 PM

**Ocean Science is for Everyone: MME's 27th Annual Marine Science Conference and Meeting.** Woods Hole, MA. Cost \$50.00. Information: Linda McIntosh (email: LJM\_MME@danahall.org). Contact Rick Schmidt, 617/287-7666, (rick.schmidt@umb.edu) for registration. See our web page [www.massmarineeducators.org](http://www.massmarineeducators.org).

May 14-June 5, 2003

**Dive and Discover 2003 online expedition to the New England Seamounts.** Information: Stephanie Murphy, (samurphy@whoi.edu) 508/289-2271; www.divediscover.whoi.edu. See article above.

July 21-25, 2003

**National Marine Education Association (NMEA) Conference.** Wilmington, NC. Information: <http://www.marined.org/>.

## President's Message, cont. from page 1

posted and forward it to our webmaster. In that way, many of the lessons we have used over the years can be a click away for others to use. I hope to see several of these lessons ready to post (with your credit line for preparation) by the end of this school year. Let's see if we can have six-ten lessons posted by the end of the year.

As my term as president nears an end, I would like to thank all those who have helped me over these two years to make the task easier. In this term, we have reactivated the web site, produced several great issues of *F&J* with lots of hard work by Barbara Passero, had successful HSMSS and WHOI conferences, and we have a Boston Harbor Conference planned for the fall thanks to Peg Collins and her committee. As usual, Jack Crowley has kept us on task during the year. A successful summer content institute was held last summer, and we are planning for another one this summer. Keep up-to-date by checking the calendar at our web site ([www.massmarineeducators.org](http://www.massmarineeducators.org)) since we will update it frequently as new information comes up. I look forward to seeing you at this year's HSMSS (probably already history when you receive this publication) and at the WHOI Conference on May 3.

## Howard Dimmick

## Calendar, cont. from column 1

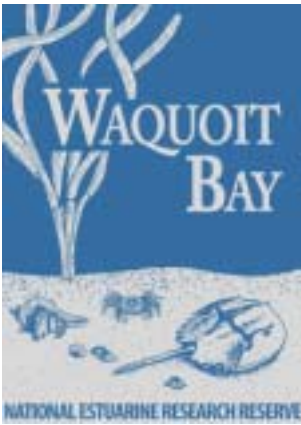
August 10-15, 2003

**Fourth Professional Education Program** at the Coast Guard Station, Eastham, MA. Information: Gail Brookings, gbrookings@juno.com.

October 4-5, 2003

**Boston Harbor Educators Conference.** South Boston High Schools, Boston, MA. Information: Peg Collins, Ccndpclns@aol.com.





## The Waquoit Bay National Estuarine Research Reserve

The Waquoit Bay National Estuarine Research Reserve (WBNERR) is located on the south shore of Cape Cod, MA, in the towns of Falmouth and Mashpee. It encompasses some 3,000 acres of open waters, barrier beaches, marshlands, and uplands. Land components include Washburn Island, South Cape Beach State Park, property surrounding the Quashnet River, and Reserve Headquarters.

The Waquoit Bay NERR is part of the National Estuarine Research Reserve System, which presently includes 25 sites in 20 states, and Puerto Rico. Each site represents a different coastal region. The Waquoit Bay Reserve is representative of the Northern Virginian biogeographic region, from Chesapeake Bay to Cape Cod. WBNERR is co-funded and co-managed

by the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management, Estuarine Reserves Division, and by the Massachusetts Department of Environmental Management, Division of Forests and Parks.

### Educational/Public Programs

Pat Harcourt, Community Educator, presents teacher workshops on coastal topics, adult education classes, coastal decision-maker workshops, summer interpretive programs, and public events such as Evenings on the Bluff and the Watershed Block Party. Publications include a groundwater curriculum (Watersheds at Bay), newsletters, and brochures on coastal issues. Reserve staff also consult with school districts to integrate water quality monitoring, watershed field trips, and other investigations into the curriculum.

### Research at WBNERR

Research at WBNERR has followed two general agendas. Some studies have addressed issues of concern to the national reserve system research program. (Beginning in FY 1993, this program incorporated a ten-year plan consisting of two-year "sets" of research priorities.) The remainder of the work has been directed at issues of local concern. Investigators have come from the nearby research community at Woods Hole as well as from numerous other institutions (e.g., colleges, universities, and government agencies). The broad scope of the research has included diverse topics such as studies of shellfish larvae ecology, bird habitat utilization, coastal erosion, boating-induced sediment resuspension, wetland denitrification function, primary producer response to nutrient addition, tidal flushing, fecal bacteria identification techniques, functionality of submerged aquatic vegetation beds as fish habitat, and the effects of CCA-treated wood on the benthos.



Adapted from the web site of the Waquoit Bay National Estuarine Research Reserve, Massachusetts Department of Environmental Management, P.O. Box 3092, Waquoit, MA 02536, (508) 457-0495 ext. 106 phone; (617) 727-5537 fax; pat.harcourt@state.ma.us. More information is available on the Waquoit Bay National Estuarine Research Reserve website at [www.waquoitbayreserve.org](http://www.waquoitbayreserve.org).



## Marsh Mystery Water

North Carolina National Estuarine Research Reserve (<http://www.ncnerr.org>)

### Objectives:

- To develop skills in observing
- To develop skills in classifying solutions by density
- To develop skills in making inferences
- To develop understanding of estuaries and mixing of salt and freshwater

### Vocabulary:

- estuary
- density
- liquid salinity
- saltiness
- sample
- solution
- tidal creek
- sound

### Materials:

- Clear straws (only clear work) – cut part of them into 2 inch pieces – leave 1 whole for each group.
- Modeling clay
- Food coloring
- Pipettes or medical droppers
- Cups
- Kosher salt (regular salt works – but Kosher works better)
- Tray to put the clay on to hold the straw pieces (clean meat trays work well)

### Procedure:

In this activity, students explore density (weight per unit volume or weight for the same amount) of several different salt solutions. The solutions model the changes in salinity that occurs as freshwater streams enter the salty ocean.

To help your students understand the experiments they are to perform, do a sample demonstration to get them prepared. Make a saturated solution of cold water and salt (colored blue with a couple drops of food coloring). And pour it in a baking dish. Then gently pour warm water (colored red) over the top of the cold water (the gentler the better the water will layer). Have your students make observations of the layering takes place. Explain that the blue water, which contains salt, is denser than the red water. (You may want to defer discussion of the effects of temperature on density until after they have completed their experiments.)

Prepare in advance a series of four solutions in 20-ounce plastic soda bottles ahead of time for the students' experiments.

1. In the first container marked R (for red), place 14.4 teaspoons (2.4 oz) of coarse salt and 20 oz of water. Use kosher salt if possible. Add enough red food coloring to make a deep red solution.
2. In the second container marked G (for green) place 9.6 teaspoons (1.6 oz) of coarse salt to 20 oz of water. Add green food coloring.
3. In the third container marked B (for blue) 4.8 teaspoons (.8 oz) of the coarse salt to 20 oz of water. Add blue food coloring.

- In the fourth container marked C (for Clear) add no salt.  
(These samples last forever and just a little is needed for the experiment.)

### Share the following with your students:

#### Directions:

A team of scientists collected a series of water samples from a freshwater stream, a tidal creek, the sound and the ocean. The team was interested in studying the salinity or saltiness of the water. On the way back to the laboratory, the labels came off the samples. Can you figure out which sample came from the stream, the tidal creek, the sound and the ocean? How could you experiment with these solutions to figure out which sample came from the sound?

One difference in the water samples is the density. Density is the weight per unit volume or weight for the same amount. The salty ocean water would be more dense than the fresh water because it has more salt.

Because the water samples are not clean, we will not taste them. One way we can investigate the density of these samples is to see which water samples mix and which samples layer one on top of the other. The most dense (have the greatest saltiness). Which water sample would be the least dense?

Food coloring has been added to help you see the different water samples. By placing drips of the unknown solutions into clear drinking straws, we can see which layers mix and which layers do not easily mix.

Provide each set of students with 12 straw test tubes. Test tubes can be made by inserting a two-inch segment of clear straw into a flattened ball of florist clay. Provide each pair of students with four pipettes and a small labeled cup containing each of the unknown water samples. Each pair of students will need a copy of the diagram.

Instruct your students to predict which combinations of water samples will mix together and which will not mix and will stay separate. Mark those combinations that you think will stay separate. Mark those combinations that you think will not mix with a circle. Mark those that you think will mix together with an X. (The predictions will be more meaningful if students will predict and experiment one combination at a time?)

After students have had a chance to experiment, ask them to study their results and predict which sample came from the stream, the tidal creek, the sound and the ocean.

### Discussion and Thought Questions

- Where would you expect to find the densest water?
- How would the density of the marsh change if a heavy rain occurred?
- If you had a boat that was less dense than water would you expect it to float or sink?
- Is it easier to float in a freshwater pond or in the ocean? Why?

### Spin Off

If you can take a coastal field trip, use a hydrometer to measure the density of water at various locations along the estuary and on the beach. Discuss how tides affect the salinity of the estuary.

## Marsh Mystery Water Worksheet

### Part 1: Predict

Predict which of the water samples will mix together and which of the water samples will layer.

Put a circle around those sample pairs that you think will layer.

Place an x on those samples that you think will mix.

Blue	Blue	Blue	Clear	Clear	Clear
Green	Red	Clear	Blue	Red	Green
Red	Red	Red	Green	Green	Green
Blue	Clear	Green	Blue	Clear	Red

### Part 2: Experiment

Test each of the combinations of water samples to see which water sample is the most dense and which is the least dense. Add 10 drops of each colored water sample to the straw "test tube."

Draw a circle around those water samples that made layers.

Place an x on those samples that mixed together and did not layer.

Blue	Blue	Blue	Clear	Clear	Clear
Green	Red	Clear	Blue	Red	Green
Red	Red	Red	Green	Green	Green
Blue	Clear	Green	Blue	Clear	Red

# Membership Application

May 1, 2003 - April 30, 2004



Please send this application and your check made out to MME to:

Joseph La Pointe  
67 Maple Street  
West Roxbury, MA 02132  
jglapointe@aol.com

I wish to become a member of MME  New  Renewal in the following category:

- |  |          |   |          |
|--|----------|---|----------|
| <input type="checkbox"/> Active member (1 year)  | \$ 20.00 | <input type="checkbox"/> Organization member (1 year) | \$100.00 |
| <input type="checkbox"/> Active member (5 years) | \$ 80.00 | <input type="checkbox"/> Student member (1 year)      | \$ 11.00 |
| <input type="checkbox"/> Life member             | \$400.00 |   |          |

## MAILING ADDRESS (please print)

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Organization \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zipcode \_\_\_\_\_  
Telephone \_\_\_\_\_  
Email address \_\_\_\_\_

Grades and subjects \_\_\_\_\_

Fax number (work or home?) \_\_\_\_\_

- Please check here if you **DO NOT** wish to have your home information published in our membership booklet.

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## Massachusetts Marine Educators

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