We are often asked whether we conduct estuarine biology research at CMM. The answer is “yes,” but not in the same manner as a conventional research institution. There are numerous research laboratories in the area that conduct basic or “pure research” designed to answer questions about the complex nature of the Chesapeake Bay. Research in CMM’s Estuarine Biology Department follows a much different course, since we are not equipped or staffed to do pure research. Our mission is to develop and maintain exhibits that display the diversity of life in the Chesapeake Bay, and to interpret the complex ecology of the estuary.

This can be a very challenging undertaking that often involves research into how to accomplish a particular objective. For example, the Skates and Rays exhibit, which has been quite popular with visitors, took almost two years to develop. We were faced with several challenges. First, we wanted to exhibit skate embryos as they developed inside the egg case, or “mermaid’s purse.” To accomplish this we had to develop a procedure to get the skates to breed in captivity and to produce eggs beyond their normal three-month period in the summer. This was to ensure that we had embryos to exhibit throughout the year. Other facilities had attempted this with varying success, but generally could only get them to mate once during the first year of captivity.

After experimenting with various techniques we were eventually successful in this endeavor, and have had the same skates mate multiple times over a three-year period. This has provided us with a relatively steady supply and large number of embryos. The key to captive breeding was a combination of light, temperature, and the diameter of the holding tank. This success has allowed us to ship surplus embryos and hatchlings to several large aquariums for use in their exhibits. We have also shipped skate embryos to a research facility in Florida for use in biomedical research. Sharks, skates, and rays have immune systems that are similar in many respects to humans, and have very low rates of cancer tumors. Research has determined that they produce yet-unidentified substances that kill cancer tumors. If the elasmobranch immune regulatory molecules can be identified, we may have another weapon in the fight against cancer.

Continued on page 6
MUSEUM BOARD FOR 2007

There are three new members on the museum’s Board of Governors in 2007. Anthony J. Benn is employed by Booz Allen Hamilton as a Defense Technical and Engineering Consultant and resides in Lusby. He is a retired naval officer, a technology consulting businessman, and is actively involved in the local community. Ms. Pat G. Carpenter, of Chesapeake Beach, is president of a nationwide fundraising network for Republican women candidates for public office at all levels of government, and she has special interests in the environment and the Chesapeake Bay. Jeannie Cousineaux Stone of Dowell is a restaurateur with Stoney’s Seafood, Inc., active in the Calvert County Chamber of Commerce and the Solomons Business Association. She has a strong interest in tourism. The new members were welcomed at the board dinner on December 6, and three retiring board members were recognized for their service: Richard H. Fischer Jr., John P. Ford, and Edward Gregory Wells.

Board members who will continue in 2007 are: David E. Butler, Robert S. Crum, Robert S. Currie, Karen Everett, Marshall S. Gibson, Michael L. Hewitt, Dennis M. King, Marvin E. Oursler, Constantine J. Pappas, James B. Perkins III, Kirk L. Swain, and Robert L. Swann. Ex officio members include County Commissioner Gerald “Jerry” Clark, CMM director C. Douglass Alves Jr., and Rear Admiral Timothy Heely, Commander, Naval Air Warfare Center, Aircraft Division, at the Patuxent River Naval Air Station. Kirk Swain was elected as chairman for 2007.

Members of the museum’s Board of Governors also serve as directors of the Calvert Marine Museum Society, Inc., responsible for fundraising.

Solomons Maritime Festival Scores with Supporters

This year’s Solomons Maritime Festival (see page 8) has attracted significant support from local organizations and businesses – all coming together to make this celebration of Southern Maryland Traditions possible.

Benefactors: Thanks to the Calvert County Board of Commissioners, the event is free and open to the public — there is no museum admission charge and no fee to ride the boats.

Sponsors: We are grateful to our sponsors, who donated $500 to $1000: The Patuxent Small Craft Guild, the Waterman’s Association, McCready Railway, Zahniser’s Yachting Center, and Washburn’s Boat Yard.

Supporters: Our supporters donated $250 - $350 to help us mount this great event. Thanks go to Chesapeake Energy Services, Drum Point Marina, and Spring Cove Marina. Friends: And our friends, who have donated up to $250 include the Holiday Inn Select Solomons and Sea\Tow Southern Maryland.

We have also received generous donations for the Marine Auction to take place starting at 1:00 on Saturday, May 5. Don’t miss your chance to bid on a boat slip at Calvert Marina or a free boat wash — among many, many other collectibles, services, and serviceable items.

We are still looking for contributions of collectibles, useful items, services, and nautical whimsy. Contact Wanda Digennaro or by phone at 301-863-2843 or by e-mail: wandadigennaro@aol.com.
THE DOOBIE BROTHERS

IN CONCERT – JUNE 24

On Sunday, June 24, Ralph’s Dodge-Jeep and Cumberland & Erly, LLC, present rock legends The Doobie Brothers in concert at Calvert Marine Museum’s Washington Gas Pavilion. Members’ tickets sales begin Thursday, May 10, at 10 a.m. via www.calvertmarinemuseum.com or by calling 1-800-787-9454. Tickets are $45 for Premium Seating and $35 for Reserved Seating. Members may reserve up to eight tickets per membership. Corporate levels may purchase up to twenty. Public sales begin Thursday, May 17, at 10 a.m.

Two decades of top hits include the bluesy rock of Long Train Runnin’ and China Grove, to the country tinged Black Water, and the gospel/jazz rooted Takin’ It to the Streets.

For further information, please contact the Development Department at 410-326-2042, ext.16, 17, or 18.

COUNTRY STAR SARA EVANS

COMING TO CMM – JULY 27

On Friday, July 27, country star Sara Evans hits the stage. Known for her 2006 appearance on Dancing with the Stars and recent #1 hits, No Place That Far, Born to Fly, Suds in the Bucket, and Real Fine Place, this is sure to be one hot ticket.

Members’ sales begin on Tuesday, June 5, at 10 a.m. Tickets are $50 for Premium Seating and $40 for Reserved Seating. Public sales start June 12, at 10 a.m.

Concert sponsors are Ralph’s Dodge-Jeep; Cumberland & Erly, LLC; Coors, Coors Light, & Killian’s; G&H Jewelers; Roy Rogers; Solomons Landing; DM Group; 98 Star FM; Mom’s in the Kitchen Catering; Southern Maryland Newspapers; Bay Weekly; Southern Maryland Electric Cooperative; Quick Connections; Comcast; Harley Davidson; Marrick Homes; The McNelis Group, LLC; Patuxent Architects; and Holiday Inn Select Solomons. For more information, call 410-326-2042, ext. 16, 17 or 18, or visit www.calvertmarinemuseum.com.

2007 MEMBERS TRIP

Potomac Eagle Scenic Railroad

Members – All Aboard! Ride the rails through the West Virginia mountains on Saturday, October 6, at 2:00 p.m. Hop aboard in Romney, West Virginia, for a scenic 3.5-hour narrated tour. Experience “The Trough,” a spectacular narrow mountain valley, view historic farms, lush mountain greenery with hints of fall color, and native wildflowers, as you keep an eye out for the American bald eagle, native to this region. This majestic bird is seen on over 90 percent of railroad excursions, so get your camera ready.

Limited seats are available in coach and first class. Coach tickets are $35 for adults and $20 for children ages 6-16; under 6 free with parent. First Class tickets are $65 (ages 6 and up), and include a climate controlled seating area, lunch with baked chicken or steak, vegetables, and dessert, unlimited non-alcoholic drinks, and an attendant. Under 6 free in first class with parent, but there is a $10 fee if a meal is required. An on-board snack/concessions car will be available or you may bring your own picnic-style lunch. All ticket prices include round-trip bus service from Solomons.

To purchase tickets or for more information, please see the flyer in this Bugeye Times or contact Debbie Strozier at 410-326-2042, ext. 16 or e-mail at strozida@co.cal.md.us.
WINTER EVENTS AT THE MUSEUM

“Winter Lights” on January 13 and 14 attracted displays from more than the local area. Representing New Jersey were (left to right) Sheila Himes, Debbie Megoniegal, Anne Hikes, and Marty Hudspeth. CMM photo by Bob Hall

Lighthouse artist Harry Richardson and his wife Deborah Lovelace at a reception at the Cove Point Lighthouse on January 13, a part of CMM’s “Winter Lights” weekend. CMM photo by Bob Hall

Display panels of artwork of students K-12 of the Calvert County Public Schools were mounted in the museum lobby during March. CMM photo by Bob Hall

Lighthouse authors Cheryl Shelton-Roberts and Bruce Roberts at “Winter Lights.” CMM photo by Bob Hall

Al Suydam and Jim Wilson at work in the Patuxent Small Craft Center restoring the Witch of the Wave, a sailboat built in the 1960s by Capt. Dick Hartge of Galesville. When restored, the boat will be kept aloft at the museum. Photo by Butch Garren

Volunteers who supported the Development Office during 2006 were recognized at a luncheon on February 22. CMM photo by Sherry Reid

One of the panels displayed in the CMM lobby during Black History Month. Vincent Leggett discussed “Blacks on the Chesapeake” during a lecture and book signing at the museum on February 28. CMM photo by Bob Hall

The Deanna Bogart concert in the auditorium on March 2. CMM photo by Bob Hall
The College of Southern Maryland will be offering an enrichment course at the museum in June — the beginning of what we hope will be a strong collaboration. Jeff Mason will teach “Pirates, Scallawags, and Scoundrels,” on three consecutive Saturdays, June 2, 9, and 6, from 9:00 a.m. to 1:00 p.m. Come discover interesting facts about the 1608 exploration of the Chesapeake Bay by John Smith, acts of piracy by William Claiborne of Kent Island in 1635, the role of privateering in the Bay during the Revolutionary War, and the little-known oyster wars between Maryland and Virginia watermen in the 19th and 20th centuries. Course number is PEP 5950 / 60366. Total cost $45.00, seniors 60+ cost is $35.00. You can register at any CSM campus location, Monday thru Thursday, 9:00 a.m. - 7:00 p.m. and Friday 9:00 - 4:30 p.m. For more information contact Vickie Grow at 301-934-7652 or e-mail vickieg@csmd.edu.

### Camp CMM 2007 – Adventures Not to be Missed!

Summer Day Camps at the Calvert Marine Museum offer a range of topics for children and youth entering first through ninth grades. All camps are active, participatory, fun learning experiences. Campers bring their lunches and picnic together. Grades indicate the level the student will be entering in September. Space is limited and camps fill quickly, so call today and ensure your child a summer adventure to remember.

**Our youngest campers**, entering grades 1-3, will be embarking on adventures as **Pirates of the Chesapeake**. These buccaneers will become pirates for a week, eating, dressing, and sailing the high seas on the *Jolly Roger Tennison* just like the pirates of old.

For children entering grades 4 and 5, we have a special opportunity. Two week-long camps which can be experienced individually or consecutively will focus on **John Smith’s Exploration of the Chesapeake**. Week one highlights his encounters with native people, while week two delves into the voyage itself. A visit from the John Smith shallop intersects these two adventures, along with field trips to Jefferson Patterson Park and Museum.

Students entering grades 6 and 7 can really jump into the action with **Boating Adventures**. This is a chance to put new skills to work navigating a boat, building a model boat, riding in some of the boats here at the museum, and taking a canoe trip.

Our middle school camps, for young people entering grades 7 to 9, are both two-week camps. **Bay Trek2** follows last year’s highly successful Bay Trek, taking adventuresome youth into the marshes and shallows to learn about our ecosystem and how to preserve it. Former Trekkers are encouraged to return. Application requires a teacher’s recommendation, but no prerequisite is required.

The **Maryland Summer Center for Paleontology** is offered in conjunction with the Calvert County Public Schools and invites participants to become junior paleontologists, learning the fieldwork skills necessary to find, prepare, and identify local fossils.

For detailed information, visit our website: [http://www.calvertnmarinemuseum.com/education-children-and-family.htm](http://www.calvertnmarinemuseum.com/education-children-and-family.htm)
Estuarine Biology Research at CMM

(Continued from page 1)

Once we had a supply of embryos, our next task was to determine how to keep them alive so that they would hatch out. Several institutions that we contacted said that their embryos usually died before hatching. We set up a controlled temperature tank and tested survival at various temperatures. This took time, as we only had room for one tank. We would add embryos at a set temperature, monitor survival, and the time until hatching. After each experiment was completed (which took up to three months), we would start over at a different temperature. Eventually, we determined that the embryos did not survive well if the temperature was much above 20 degrees Celsius (68°F) or below 5 degrees Celsius (59°F). We also wanted to slow down the development of the embryos to maximize the time it took to hatch. This was to ensure that our visitors would be able to see them developing during the winter. Normally, the embryos would have all hatched out by early winter, and we did not want to have an empty exhibit tank. Our survival data from the temperature experiments showed that at 20°C, it took about 90 days from the time the egg case was released until hatching. At 16°C, the development time was extended to approximately 145 days, as the cooler water slowed the process. As this was the lowest temperature at which we had good survival, it was apparent that we needed to design our exhibit tank with a chiller that could maintain a temperature of 6°C. We passed this information on to colleagues at other institutions who now have better success at keeping their embryos alive. Since there are no books or college courses on how to maintain public aquariums, staffs frequently exchange information on how to achieve exhibit objectives.

The next challenge involved compatibility of skates and rays. Skates are a cool water species that live on the bottom where there is less light. Cownose rays, on the other hand, are a warm water fish that swim near the brightly lit surface. In the wild they can easily avoid each other, but problems arise when they are placed together in a small tank. One would intuitively conclude that the larger rays would dominate the much smaller skates, but the opposite is true. We were advised against mixing the two species, as the skates, particularly the females, would attack the rays. We worked on this for a while and determined that the aggression tended to develop after the skates reach sexual maturity. If we used juvenile skates, the aggression was minimal. Thus, we are able to keep both species in the same tank by removing the skates when they become mature and start attacking the rays. The mature skates are then replaced with more juveniles.

Our final task for the exhibit was to determine a temperature and light combination that was suitable for the cold-water skates that preferred dark conditions and the warm-water rays that liked lots of light. We found a compromise temperature of 19-20°C that both species could tolerate. After over a year of work, we were now able to design and construct an exhibit that could both achieve our interpretive objectives and ensure that the two species of skates and rays would survive. Our skates have mated many times and produced a large number of embryos, almost all of which have hatched out. We feed them in holding tanks until summer. We have also constructed portable tanks, and several times a year we travel to the Eastern Shore and release the baby skates — about 500 to date — off the barrier islands of Virginia, where they survive better in the high salinity water.

The skate and ray research is one example of the type of work that we do here at the museum. We often try to figure out what to feed a new specimen, nurse it back to health after capture, eliminate parasites, or try to understand why something happened that we did not expect. Our research, therefore, is driven by our interpretive objectives, as well as the husbandry requirements of the animals under our care. 

In the hatchling tank in the Skates and Rays exhibit, visitors can observe skate embryos developing inside the egg case. The embryos at the bottom have been removed from the “Mermaid’s Purse” and continue to grow and eventually begin to feed after the yolk is consumed.

CMM photo by Laura Magdeberger
Gateway to Maryland’s Prehistoric Past

The Calvert Marine Museum was the recipient of a National Parks Service Gateways Grant to upgrade our paleontology gallery. Our existing exhibits focus on some of the amazing creatures that lived in the prehistoric Atlantic Ocean that covered southern Maryland between eight and eighteen million years ago. This emphasis will not change, but we have never tried to show museum visitors how the fossils from Calvert Cliffs fit into the larger 4.5-billion-year-old story that is the history of life on Earth.

To achieve this, several major changes have already begun to occur in our paleontology gallery. To create the space needed for a geological time-line mural, we are moving and expanding the existing fossil preparation laboratory to the end of the paleontology gallery behind the extinct giant white shark skeleton. The existing fossil-containing drawers will also be removed to make room for the mural showing when dominant groups of prehistoric plants and animals lived and when major geologic events occurred. This mural will highlight where the Calvert Cliffs fossils fit into the grand scheme of things.

Hands-on exploration stations will include a mixture of genuine fossils and fossil casts to touch, as well as touch-screen monitors offering curious visitors the added option of digging deeper into any of the iconic fossils on display as well as those not on display. Three on-screen animations will also be part of the exhibit. The first will show how Calvert Cliffs and the Chesapeake Bay began at about the time North America rifted from North Africa 225 million year ago. The second and third geoanimations will tell the stories of how the sediments and fossils that now comprise Calvert Cliffs were laid down during the Miocene Epoch (five to twenty-five million years ago), and show that the Chesapeake Bay as we know it is only about ten thousand years old, the result of a period of global warming at the end of the last ice age.

A life-restoration of the prehistoric elephant, *Gomphotherium*, that lived in southern Maryland millions of years ago. This is one of many comparable drawings that CMM exhibits staff member Tim Scheirer has produced as part of our paleontology gallery upgrade. © CMM 2007

We want to know what you think!

As part of the development process for this exhibit, we want to know what you think of the design for this paleontology/geology time-line mural. On the wall above the existing fossil drawers are scaled-down illustrations of several murals now being considered. We want you to comment on whether or not you like what you see. Is the intent of the mural clear and self-explanatory? We have placed a note pad there to record your comments for our benefit. If you have comments, questions, or criticisms, we want to hear from you. Visitor input has already improved upon the original mural design. So please come by and help us produce an exciting and effective addition to our galleries that you will want to show and tell others about. (Stephen Godfrey)

Tom Konrad

The museum community was saddened by the recent death of Tom Konrad, a long-time volunteer. Beginning in 1995, Tom was active in many parts of the museum as interpreter and researcher and was best known as president of the Volunteer Council, and later as a contributor to a book on supervising volunteers. He also appeared in the CMM production of “The Beggar’s Opera.” His wife, Mary, served as a volunteer in the museum store for many years and still helps with special events.

Staff Changes

A new assistant to the curator of paleontology has been appointed. Yasemin Tulu comes to the museum from Michigan State University where she expects to earn her doctorate soon. In the Museum Store, Peggy Hovermale is now the assistant manager. Peggy has been active with the Volunteer Council.
Nominees for the Volunteer of the Year Award

Please join me in congratulating the following volunteers for receiving nominations for the Volunteer of the Year 2006. **Harry Childers** volunteers his time in the Skates and Rays exhibit and in the Discovery Room. His enthusiasm and dependability are exceptional. **Christa Conant** is always on hand to help with special events, and is able to fill in just about anywhere. **John McHenry** can be found in the Skates and Rays exhibit as well as the Lore Oyster House. **Ilsa Metz** enjoys volunteering behind the scenes, particularly in the fossil and library collections for the paleontology department. For the past six years **Herb Moore** has helped the CMM Society raise money through several events, mostly as head of civilian security and set-ups for concerts. He has recruited additional volunteers for events. **Ellis “Ski” Seidenstricker** volunteers his time behind the scenes in the library, the paleontology department, and the exhibits department. **Margaret Stamper** is a volunteer who loves the “critters” at the museum and is willing to share her knowledge with others in both the Skates and Rays exhibit and the Discovery Room. She has also served on the executive board of the Volunteer Council for the past nine years.

The winner for the Volunteer of the Year Award will be announced at the volunteer recognition event in May. It will be a difficult task to choose one volunteer from a list of so many winners. (Sherry Reid)

The Calvert Marine Museum is seeking volunteers. Volunteer with us and you will enjoy a stimulating environment, learn new things, do what you love, all while serving your community. For information on becoming a volunteer, please contact Sherry Reid at 410-326-2042, ext. 19, or visit our website at [www.calvertmarinemuseum.com](http://www.calvertmarinemuseum.com).