

The Water Column

Winter/Spring 2008

A Newsletter of the New Jersey Academy for Aquatic Sciences

Get Serious! CAUSE Academics Are No Joke

The CAUSE (Community and Urban Science Enrichment) program teaches teens serious science, and manages to get them excited enough to want to teach it to others.

New recruits begin their CAUSE experience with a 20-week course in oceanography, marine biology and animal classification. The first class covers terms and functions that will be used throughout the training. From here the teens move to the physical, geological, chemical and biological aspects of oceanography. Next comes taxonomy, the classification system of organisms. Students then move through the system, learning about organisms from algae to invertebrates (mollusca, arthropoda, echinodermata) to vertebrates including fish (cartilaginous and bony), amphibians, reptiles, birds and mammals. Along with the physical characteristics of each organism, the teens are also taught about habitats, adaptations, reproduction and feeding strategies.

Students are quizzed and tested throughout training, and tutoring is available to give them every chance for success.

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Vaneé and John dissect a shark

"I'd gone through science classes in high school, biology, chemistry, things like that, ok. But I didn't really develop a passion for science or really like having to do science...until I came here." CAUSE Alumnus

Research May Prove Cardinal Fish Moved With Continents

Current activity at the Academy's research lab focuses on the origin of direct development (lack of a planktonic-dispersal larval period) in cardinal fishes and its use in clarifying the evolutionary relationships within the cardinal fish family.

Dr. Alejandro Vagelli (Alex) first discovered this highly unusual mode of reproduction in the Banggai cardinal fish, and later in another cardinal fish species from Southern Australia (*Vincentia conspersa*).

The latest species in which direct development was found is *Pterapogon mirifica*, an endemic species from Western Australia, and the assumed closet relative of the Banggai cardinal fish. The studies on this species include reproductive behavior, gonad morphology, embryology, and osteological development.

The working hypothesis is that the highly unusual direct development first evolved in fresh-water environments (where direct development has much more ecological value) in a primitive cardinal fish on the Indian-Australian tectonic plate.



At the end of the Cretaceous Period, about 65 million years ago, a micro-continent containing the Banggai-Sula Platform separated from Australia carrying part of that primitive population which eventually evolved into the Banggai cardinalfish. Both micro-tectonic plate movement and limited dispersal due to the lack of planktonic larvae can explain the isolation and speciation (production of new species) events that gave rise to the other species with direct development in Australia.

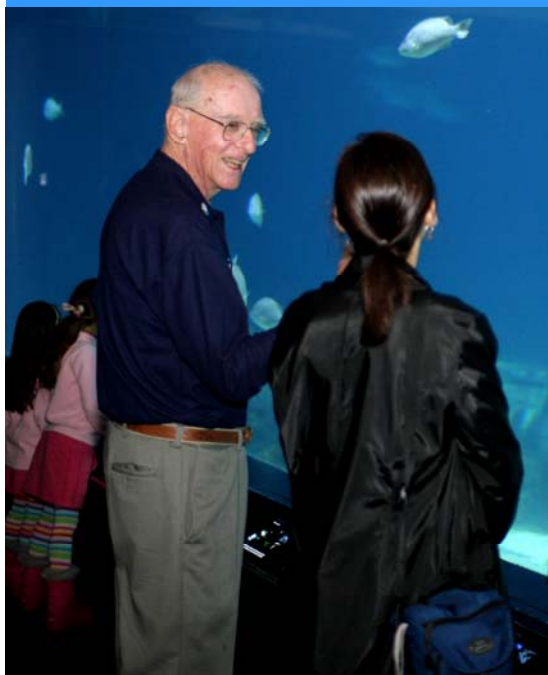
To test this hypothesis Alex plans to study the reproductive biology of the primitive (and only freshwater) cardinal fish genus *Glossamia* from Northern Australia and New Guinea, as well as their evolutionary relationship to other species. We will keep you informed of any new discoveries.

Dr. Vagelli in the Academy lab

VOLUNTEER PROFILE:

Barry Pennell

"Barry is an amazing person for many reasons, but two things stand out the most. First is that Barry has been coming in to volunteer over 16 years, but his enthusiasm and passion make you feel like every day is his first day on the job. The second thing is his old fascination with shad!" Jack Carr, Science Education Manager



Barry Pennell is the consummate volunteer. He dedicates his time and passion to the Academy (one of his several volunteer gigs), interpreting exhibits for visitors to Adventure Aquarium. Barry loves to talk about fish. He has a special affinity for shad, the fish that fed Washington's colonial army, and helped collect them for the aquarium many years ago. "We got them from the Conowingo Dam in the Susquahanna River." Barry told *The Water Column*. "It was easy because they have a fish ladder there."

Barry was one of the Academy's first volunteers. Retiring early after a stint in the U.S. Army and interesting careers in journalism and advertising, Barry saw an advertisement for volunteers for the new aquarium in Camden and called. He's been here ever since.

Along with his dedicated volunteering, Barry is also a generous donor to the Academy. "If you have money and you have a good place to put it, you should do it," he says. Barry is married to Janet, and they have two daughters, Melissa and Robin.

The Academy is very grateful to Barry for everything he does.



CAUSE Academics continued from page 1

Before the final, the teens participate in an oral practical test. They pick a training topic from a hat and must develop a two-minute presentation. They are graded on knowledge of content, body language, eye contact, voice projection, proper language, flow, and use of props. Of course the teens have been prepared for this with workshops on public speaking and other topics throughout their training.

At the end of training, the students must take a final exam. The following are some of the questions taken from the exam. See how well you do!

1. Explain the bathymetry process.
2. Name 5 types of algae. Give an example of each.
3. Explain in detail how a coral reef is formed.
4. Compare horseshoe crabs to "true" crabs.
5. Explain seahorse reproduction.
6. What is the difference between the bones of a parrot and the bones of a penguin? Why?
7. What is baleen? How does it work?

...And this final had 92 questions!

It's clear to see that any teen who has completed this course of work is more than prepared to interpret exhibits in the aquarium, which they do during the Academy's Deep Sleep overnight programs, and to teach aquatic science to younger students in after-school programs and Summer Science Camps.

Adapting intense science content for elementary and middle school students is also a challenge for the CAUSE youth. They spend many weeks preparing curricula that will be appropriate for children ranging from kindergarten through 8th grade who participate in Summer Science Camps each summer at Camden schools.

It's also clear to see why the teens claim that once they have succeeded in CAUSE they feel prepared for anything!



Rudisha teaches scouts about echinoderms at an Academy Deep Sleep overnight program.

**A message from
President and CEO
Brian DuVall**



We all have gotten used to the convenience of drinking water from disposable plastic bottles. As a result, the growth of the bottled water market has been astronomical.

Some facts: Over 1.5 million barrels of oil are used to make plastic water bottles in a year. This does not count the energy that is consumed to ship this very heavy water from a production facility to a distributor and then on to a retail outlet. In addition, those bottles have to be disposed of in some way. It is estimated that 80% of the plastic water bottles produced in this country are **not** recycled and end up in the trash. Even those that are recycled consume a large amount of energy in the recycling process.

In one year Americans spent \$11 billion on bottled water. This required the use of over 25 billion plastic bottles. That's a big number which is difficult to visualize. The following illustration might be helpful in understanding just how big a number one billion is.

If you had one billion dollar bills stacked flat on top of each other the stack would be 67 miles high. Airplanes fly at an altitude of about 6 miles. Now imagine you had 25 of those stacks. That's how many bottles are used in this country in a year. And remember, only 20% of them are recycled. The rest end up in the trash or as litter that we see all over the place. Much of that litter will eventually end up in the ocean as it finds its way into storm sewers and streams.

About 40% of water sold in disposable bottles actually originates from municipal water supplies like what comes out of your tap at home. Testing requirements for municipal water supplies are substantially more stringent than the requirements for bottled water. If there is a taste issue, your water at home can easily be filtered. Water from your sink costs thousands of times less than bottled water.

The only way changes are made is if individuals choose to make them. It wasn't too many years ago that water wasn't even available in plastic bottles. Somehow we got along. So the next time you're thinking of spending 5 or 6 dollars on a case of water, spend that money on a reusable bottle you can fill at home. You'll feel good and before you know it your new routine will be second nature. You really can make a difference.

Information source: National Geographic Green Guide

Introducing ...Two great programs from the New Jersey Academy for Aquatic Sciences!



Sea Camp Seafari

"SEA" U Later Alligator! (July 7-11, ages 6-12)

Join us as we take a look at extinct, threatened and endangered aquatic life.

CSI: Cool Shark Investigations (July 14-18, ages 6-12)

Investigate the wonders of the shark world and learn why they're feared and respected.

Junior Marine Biologist (July 14-25 for ages 13-14)

Take an in-depth look at animal care, research, collecting, and lots of hands-on science in this special 2-week adventure for older campers.

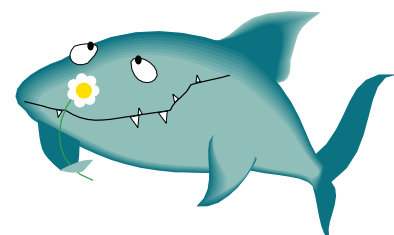
For information or to register for either program, call 856-361-1023 or visit www.njaas.org

Birthday Parties!!



You provide the ice cream and we'll bring the party animals to your home for your child's next birthday bash!

One hour of fun with games, shows, and LIVE animals* to touch!



*Our animals may include an alligator, shark or owl.



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For the friends of the New Jersey Academy for Aquatic Sciences

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Way**



United Way of
Camden County

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