

## Biography

My marine aquarium hobby started in 1976. It all began after I read a DIY article on how to construct your own all-glass aquarium. I made a 50-gallon tank and stocked it with saltwater fish. The hobby quickly turned into an obsession and also kindled what became my lifelong interest in marine biology. The one tank became two, then three, and so on. My wife allowed me to turn our spare bedroom into a “fish room.” At that time, I was a zoology major at Michigan State University, but I wanted to shift my focus to marine biology. So, we moved to Key West, Florida in 1978. I earned an Associate of Science degree in Environmental Marine Science at Florida Keys Community College. The plan was to continue my education at one of the universities in Florida once I established legal residency in the State (so that I would be eligible for in-state tuition costs), but my life took a different turn.

Just before graduating from FKCC, I began collecting my own aquarium fish and invertebrates. That in turn led to working in a local aquarium store, which I unexpectedly ended up purchasing a few months later. Over the next couple of years, I began to diversify my business (Bio Marine Tropicals) to include setting up and caring for aquariums in local businesses, mostly restaurants, bars, doctor offices, but some private homes. By 1980 I began selling fish and invertebrates wholesale. I also was selling “live” foods, like amphipods, zooplankton, and phytoplankton. I believe I was the first to offer such products to aquarists.

Through my wholesale connections, I developed some relationships with a couple of major public aquariums. I was subsequently hired as a guide and consultant for collecting specimens for a brand new and soon to be opened public aquarium, The National Aquarium in Baltimore. In the midst of all this, I was trying to pursue my preferred interests in marine aquaculture. Marine aquaculture in the early 80's was still in its earliest nascent stage. There were only a couple of true aquaculture pioneers who could claim any success at that time. One was none other than Martin Moe, Jr. who owned and operated Aqualife Research located only a few miles up highway US 1 from where I was in Key West.

Martin Moe was a major inspiration to me. I was able to visit Aqualife Research a couple of times and he was very kind to me, taking the time to show me around his facility. At that time, Martin Moe had just achieved another one of his many “firsts” by successfully raising Atlantic angelfish. I was thrilled to see many of the juvenile angels he had recently reared in one of his large grow-out tanks. The experience intensified my interest in marine aquaculture. I started working with plankton cultures, which allowed me to achieve my first comparatively very modest success by rearing neon gobies.

I began experimenting with the culture of some other species of fish and invertebrates with some limited success, but once again my life went in a new direction. In 1985 I was offered a job as the assistant curator at a marine aquarium park called Coral World St. Thomas in the U.S. Virgin Islands (owned by Coral World International, CWI). The opportunity was hard for me to pass up, so I sold my business in Key West and made the move to the Virgin Islands.

While in St. Thomas, my aquaculture plans had to be put on hold. I worked in St. Thomas as an assistant for a little over a year. I was then offered a Curator position at a new aquarium park that CWI was building in the Bahamas. I accepted the offer and the Bahamas became my home for the next 14 years. It took us nearly a year to collect livestock and prepare all the exhibits, but we finally opened in 1987, and the park became the number one attraction in the Bahamas. I served as Curator for about three years, but then I undertook the position of Aquarium Director.

I had many different responsibilities while working at Coral World Bahamas, but I was able to dabble with some small aquaculture projects. With the help of my staff, one of our most successful and satisfying aquaculture endeavors was rearing dozens of Atlantic seahorses (through three generations), nearly all of which were released back into the ocean.

Coral World Bahamas was sold to another company in 1998. This prompted me to leave about a year later. I moved back to the United States and lived in Miami doing freelance writing and some aquarium consulting work, much of it for the new owner of Coral World Bahamas. Another year or so after that, I returned to Michigan where I completed my academic goals by earning a Bachelor of Science degree in Biology followed by a Master of Science degree at Oakland University.

I worked as a TA (teaching assistant) at the University while earning my Master degree. After graduation in 2011, I was immediately hired by Oakland University to develop and teach a marine biology course for biology majors. I also was in charge of running the General Biology Laboratory course for biology majors. In addition, I taught an upper-level Animal Behavior course, General Biology II, Field Biology, and occasionally a couple of non-majors biology courses. This kept me very busy for about 10 years.

In spite of my busy work schedule, I kept up on most of the modern advances in aquarium technology and marine aquaculture. However, I really didn't think I had the time to have a home aquarium until one of my marine biology students encouraged me to do so. I am very glad that I did, since it restimulated my interests in marine aquaculture. It also motivated me to design, develop, and obtain University approval for a new Marine Biology Laboratory that complimented my marine biology lecture course starting in 2019. All of this brought me right back to my aquaculture roots.

Currently, I consider myself semi-retired. I started cutting back on my teaching load beginning in 2020. Today, I teach only three courses; Marine Biology, Marine Biology Laboratory, and Field Biology. The lighter schedule has provided me with more free time and opportunity to pursue my old interests and passion for marine aquaculture. I am doing culture work again, primarily microalgae, copepods, and rotifers. Recently, I successfully bred and raised some peppermint shrimp as a kind of preparatory activity that I hope to follow up with some much more challenging species.

I like to think of my career as coming full circle. I am refocusing my involvement in marine aquaculture, something that fascinated me from very early on. To that end, I have resurrected my old company, Bio Marine Tropicals, albeit a far more limited and narrowly focused version. To be clear, I am not attempting to compete with the many successful marine aquaculture farms that pervade today's aquarium market. My goals are far more modest. My intention is simply to sell a few "by-products" that derive from my efforts that could help offset some of the expenses. My primary motivation is largely based upon the personal satisfaction that I experience when I am able to accomplish something few others have. Also, I will admit to a more quixotic inspiration; achieving something that no one else has. Wish me luck!

Gary Miller, M.Sci.



Atlantic seahorse broodstock in a display aquarium at Coral World Bahamas. The orange-colored male is apparently very popular with the ladies! Seen here with three females, this male was one of the more prolific breeders in our aquarium. If you don't see three females, count the seahorse tails.





A "pregnant" male seahorse. As you may already know, it is the male seahorse that has the burden of carrying the eggs and giving birth to the baby seahorses. In this photo, you can easily see the special pouch on the lower abdomen where the male seahorse carries the developing offspring. When giving birth, the seahorse expels the babies from an opening at the top of the pouch. At the risk of sounding anthropomorphic, the male appears to experience contraction-like spasms while giving birth. When I describe the seahorse reproductive process to women, I frequently sense that they find it as some sort of poetic justice.



Second generation captive bred seahorses. Although we released most of our captive bred seahorses back into the ocean (in known seahorse habitat areas), we did maintain a few in a display aquarium at Coral World Bahamas. These in turn reproduced in captivity. Most wild populations of seahorses are known to be in decline. It was exceedingly gratifying to be able to rear a few of seahorses in captivity, but release hundreds more back into the natural environment.





One of my home aquariums



A pair of flame angelfish in my home aquarium.