With all this talk about the declining Great Barrier Reef I felt compelled to throw in my two cents. I am confused with the way the term Great Barrier Reefs has been described in the recent letters. As I understand it the GBR is a discontinuous 2000 long strip many miles off shore and separated from shore by a deep lagoon with hundreds of patch reefs, sandy islands and the tops of hills/mountains that were flooded by rising sea level during the past 18,000 years. The writers and the recently cited biological paper (27-year decline) tend to lump all the varied reefs into one entity called the Great Barrier Reef. It is my understanding that the true barrier reef is the narrow discontinuous outer strip of coral and reef sand that faces the open ocean.

The narrow offshore barrier I have read about is a thin veneer of coral capping pre existing topography. There is not a lot on this outer barrier for COTS to eat. Please correct me if I am wrong. The lush coral we all know about is around those large patch reefs many miles landward of the outer barrier. Are not these reefs more likely to be devastated by COTS?

I certainly am not an expert on the GBR but I did do a tour there in 1972. Like most people I did not see the actual Barrier reefs that face the open ocean. My knowledge of those outer barrier reefs is based purely on geological accounts. Fortunately my weeklong tour followed the huge starfish epidemic that occurred in the late 1960s and had run its natural course. That epidemic was one of the hot topics at the Third International Coral Reef Symposium in Miami in 1977. Arguments that it was human induced were similar to those of today except that bleaching, climate, and disease were still on the horizon. Several Australian scientists went at each other with great vigor. Some geologists had taken cores, dug holes, and found layers of the distinctive skeletal parts of COTS indicating the infestation was nothing new. Some outspoken biologists on the other hand, vigorously refused to accept geological observations. They opted for humans as the cause and blamed the cause on collection of a snail that preys on starfish. The division between anthropogenic and natural causes seems little changed over the past 35 years.

The first stop on my 1972 tour was Heron Island near the southern portion of the barrier reef complex. Besides my amazement that Pacific corals could survive more than an hour of subaerial exposure during low tide I was greatly impressed with the lush variety of corals. Surprisingly people were walking and collecting (Fossicking) on the vast exposed reef flat. I rented a skiff and took many underwater photographs on the flanks of the reef area. On my return to the dock I told the man in charge that I had seen a grouping of bomies I recognized from a televised nature film but did not see the starfish that had been the programs centerpiece. The boat rental agent said, "Mate we brought that starfish from a reef 30 miles away and placed it there for the program."

The next stop was Hayman Island in the Whitsunday group of mountaintops surrounded by fringing reefs. That stop was not very instructive but still there was no evidence of COTS. However, the next stop, Green Island, was most instructive. COTS had decimated hard corals around the island and the reef sand consisted almost exclusively of starfish fragments and spines.

These observations suggested that COTS did not affect all of the hundreds of islands and patch reefs in the Barrier Reef lagoon. I do not know if they occurred on the outer barrier many miles seaward but it was clear they had not damaged the lush reefs around Heron Island.

At the Ninth ICRS in Bali in 2000, I was surprised to see a session devoted to muddy water coral reefs. About 24 papers described muddy water coral reefs that occur closer to shore in Australia.

These reefs are little known and tour guides are not likely to take tourist divers to these reefs where the water is too murky for underwater photography. In spite of the evidence that such reefs exist the myth that corals cannot live in muddy water persists. Of course they are not the flamboyant colorful coral species one expects farther off shore but as a geologist I recognize these as more like reefs in the geological record.

More up to date, a recent 2012 issue of the Journal Geology contains a paper with the long title, "Evidence of very rapid reef accretion and reef growth under high turbidity and terrigenous sedimentation." That study describes 8 muddy water reefs near Magnetic Island and is based on cores and 40 radiocarbon dates. The study documents the surprising result that these reefs have accreted faster than clear water reefs father off shore! How can this be? The simple answer is that the high sedimentation rate blankets dead corals and thus preventing bioerosion that usually reduces dead corals to sand and rubble. This observation is counter intuitive but makes good sense. It is a likely explanation for the thick, mud-rich, coral and Rudistid reefs preserved in the geologic record. Of course it is a Goldie Locks situation. The sedimentation rate must be just right. Not enough to kill the coral but just enough to blanket dead coral surfaces and fill spaces between the corals.

In recent years we have recognized similar examples in the Florida Keys. Corals offshore close to the clear Florida current have experienced rapid demise while corals closer to shore where visibility is greatly reduced have survive. It should also be noted that many of these near shore reefs succumbed to cold winter temperatures in 2010. All things considered there seems to be a striking similarity between the Great Barrier Reef area and the Florida Keys situation. In Florida the thickest reef accumulations (places like Grecian and Key Largo Dry Rocks) occur starting about a mile landward of the outer barrier we generally call the Florida reef tract. This outer 6,000-year-old Holocene barrier is for the most part is under less than 8 to-10 meters of water and less than 1-meter thick. The more shoreward reefs that have grown up to sea level are roughly 10-meters thick. Likewise, the thickest reefs in Australia are also well shoreward of the outer barrier.

With these observations in mind I encourage researchers worrying about the future of Australian coral reefs to be more specific about what they refer to as the Great Barrier Reef. Gene