

## **I Want to Live for Two Weeks Underwater in Aquarius Because...**

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I want to live underwater for two weeks in Aquarius because I want to see, touch and explore the amazing undersea world for more than forty minutes at a time. Simply put, spending two weeks on Aquarius would be my dream-come-true, joining the handful of scientists who have had the privilege of observing the complex, mysterious interactions of marine life by actually living on the ocean floor.

Living on Aquarius would be like living on the International Space Station. To me, however, ocean exploration has an element that space exploration does not. Unlike space, oceans have thriving life; some of the most fascinating life forms live in the sea. Since we have only explored about one percent of the seafloor, there are countless organisms waiting to be discovered. Sadly, some may never be discovered before pollution, global warming, deep-sea trawling and other manmade hazards kill them off. When I return to the surface after two weeks as an aquanaut, I imagine that I will feel like an astronaut returning from space because, like an astronaut, I will have seen an entirely different world up close and will want to share my experience with everyone.

I have wanted to be a marine biologist since the fourth grade, when I worked with a marine biologist studying coral reef fish. My interest in marine life continued and, later, my father gave me one of Jacques Cousteau's books that detailed his amazing research in the *Conshelf II*, his underwater living habitat in the Red Sea. I was intrigued by Cousteau's discussion of a new and experimental way of diving in which divers could stay underwater for at least twenty-four hours and absorb the maximum amount of nitrogen in their bloodstream, then theoretically be able to stay underwater in pressurized habitats indefinitely. Recently, I read Gregory Stone's account in *National Geographic* about his experiment on Aquarius in which he implanted electronic tags into a variety of reef fish and tracked their movements throughout the coral reef sanctuary. If I had a chance to work on Aquarius, I would conduct a similar experiment to track endangered species such as the Goliath Grouper, which commercial fisherman sometimes catch illegally outside the reef sanctuary. This research might help us to protect and better manage the habitat of endangered species and improve our research methods. If I had the chance to work on Aquarius, maybe I could help save corals and threatened species or I could collect data or discover chemicals that might lead to cures for diseases. For example, some deep-sea and reef sponges and corals produce defense enzymes that could be used to destroy cancerous cells. This type of research is invaluable to the advancement of science.

If I had to choose a location for Aquarius, I would continue its operation inside the Florida Keys National Marine Sanctuary. Yes, you could locate Aquarius off the coast of California or Maine, but that is not practical. Those areas aren't in immediate danger. By contrast, the chain of coral reefs in the Florida Keys National Marine

Sanctuary is the last remaining coral reef in the continental United States waters and the second largest barrier reef in the world. Unfortunately, it is disappearing fast. Losing this reef would be like losing the Grand Canyon or Yellowstone National Parks. Not only are they spectacular, but coral reefs also house members of thirty-two out of the thirty-eight known animal phyla, and have more organisms per unit than rainforests. Why are they disappearing? The coral reefs of Florida are among the most plagued by coral diseases such as black-band disease, which I have seen first-hand killing a large colony of *Favities* coral while I was diving in Looe Key Reef of Florida. Outbreaks of the invasive bacteria that cause these coral diseases have contributed to die-offs of gorgonians, sea urchins, fish, and other marine organisms. In the 1980's, for example, mysterious die-offs of Long-Spined Sea Urchins (*Diadema antillarum*) caused excessive growth of algae, which suffocated the corals. Aquarius offers a unique means for long-term studies to better understand how these diseases spread and progress.

Saving the coral reefs of Florida has other enormous benefits. First, parrotfish and Hawksbill sea turtles depend on coral for food, and without it some of these species could become extinct. Second, the Florida Keys Barrier Reef is also a significant part of the Florida Keys economy, through fishing and tourism. Finally, by locating Aquarius in Florida, we can study other threats to ocean life. These are all good reasons for Aquarius to remain in Florida.

Aquarius has proven it can maintain operation in the Florida Keys. It has been down there for eleven years supported by only its surface buoy, which sustains the aquanauts with air and electricity. A skillful surface team of professionals monitors the aquanauts' vital signs and behavior closely. While saturation diving has many advantages, there are risks as well: if you are on a dive and surface too quickly, the nitrogen in your bloodstream will expand rapidly and cause bubbles to form in muscles and joints, which can result in a painful condition known as the "bends" or even lead to death. You can also become disoriented and lost, or suffer from nitrogen narcosis. However, these risks can be avoided by proper decompression. Seventeen hours of breathing pure oxygen off and on is a small price to pay to be able to stay underwater for fourteen days.

Aquarius is a great feat of technology and a valuable resource to scientists in the "grand conversation" between the environment and the human race. I am a knowledgeable and enthusiastic future scientist who could, by working on Aquarius, make the world healthier. My camera is ready. My dive bag is packed. Please call me. When I return home from Aquarius, I will be one of your best ambassadors, sharing my experiences and passion with everyone I meet.