

CURASUB

*a new arrival
in the waters
off Curaçao*

by PETER ROWE

A Fellow of The Explorers Club since 2008, Peter Rowe is a filmmaker. His recent series, *Angry Planet*, explored extreme forces of nature, and his latest show, *Alien Invaders!*, examines invasive animal species around the world, including the lionfish, a relatively new arrival in the Caribbean. This is his third flag expedition. To view a delightful video on the Curasub project: <https://vimeo.com/39362784>.



There's a new way to dive the Caribbean. The *Curasub* is a five-person submersible, designed and built by Phil Nuytten, long-time Explorers Club member and recipient of this year's William Beebe Quadrennial Medal. From his one-man, 300-meter-rated *Newtsuit* to the *Deep Rover*, *Aquarius*, and *Deep Worker II*, to his latest, the *Exosuit*, Nuytten has built a greater variety of submersibles than just about anyone on the planet. The *Curasub*, while technically evolved from the line of submersibles he has been building for more than 30 years, is unique in its purpose and application. While the others are designed for the commercial diving industry and are mainly used by oil companies and agencies like NASA and NOAA, the *Curasub*, which is owned and operated by the Curaçao Sea Aquarium, is available to anyone who would like to dive in it. The *Curasub* offers divers an environment that remains at surface pressure so there are no requirements for decompression.

Nuytten showed me the sub while it was under construction in his North Vancouver shop in 2009, promising that, "You can be sitting down at 300 meters, say 'Oh, I feel like a cup of tea'—bang, up to the surface for three minutes, have your cup of tea, back in, back down to 300 meters."

"What else will let you do that?" asks Nuytten. "I don't know of anything."

Before installing any of the electrical or operating systems, the sub had to be trucked to Texas for pressure testing and certification, then returned to Canada, then trucked back across the continent to Miami, then shipped to the Netherlands Antilles. However, the long wait is over, and the sub is now operational and making up to five deep dives per day.

This past winter I had a chance to try out the *Curasub* myself, carrying Flag #76 to explore the reefs of Curaçao. I journeyed to the sub's home base at the Curaçao Sea Aquarium in Willemstad, where I met up with its founder and director Adriaan "Dutch" Schrier, who commissioned the craft, and pilot Michiel van der Huls, who gave me an extensive tour of it before putting it in the water.

Designed for 600 meters of pressure, the sub has been tested to 460 meters and is certified for 300 meters, so it has virtually a 100 percent fail-safe capability. It has two bow thrusters, two vertical thrusters, two main thrusters, and, says van der Huls, the combination makes for a nimble, well-balanced submersible that is easy to maneuver. The *Curasub* is designed as a giant rebreather, with the carbon dioxide exhaled by its passengers being constantly scrubbed by the system, with four oxygen tanks as safety backup mounted on the stern.

Inside the cabin, there are padded benches at the front on which a photographer, researcher, or passenger can lie, plus the spotter controlling the lights and manipulator arms. The pilot sits in the middle between their feet, and behind him is a bench with space for two more guests, each with their own porthole.

As we descend into Curaçao's crystal clear waters, van der Huls reports back to the base: "Cabin pressure 1/4 positive, O₂ percentage—20.8 HBO₂ on port side is 2100. Line Pressure 100. Mains voltage 26.0 Intermittent GFM. No water alarms. HP Air port side 2100. Starboard 2000. All scrubbers functioning. Current depth 344 [feet] and descending."

With this reassuring news, we continue to head down, with Dutch moving up into the spotter's position to take control of the sub's manipulator arms. Despite his nickname, Schrier, like Nuytten, is a Canadian, transplanted 20 years ago to the Caribbean. He began diving as a spear-fisherman in British Columbia, and has been interested in diving beyond scuba limits for years, in order to capture specimens for his Sea Aquarium. For ten years he was deep into trimix diving, but at age 60 he decided to forego its dangers and instead commission the building of his own submersible in order to continue deep diving.

To collect exotic specimens, the *Curasub* is equipped with a unique configuration of two manipulator arms, both connected to a water pump. The starboard arm pumps out quinoline, a mild fish anesthetic, into holes in the rock and coral. Once the knocked-out fish drift out of their homes or hiding spots, the port manipulator arm, with a hose attached, vacuums up the fish and deposits them into a specially designed holding container.

When we get to the optimum "hunting" depth of about 625 feet [190 meters], Schrier and van der Huls swing into action, chasing down rare deepwater fish like the Peppermint Basslet, Sea Robin, Spanish Flag, and Butterflyfish. They are particularly interested in the Dragonet, an elusive colorful bottom dweller somewhat like a Lizardfish. Some of these fish are bound for Dutch's own Sea Aquarium while others will be sent to the Smithsonian Institute and Tokyo Aquarium for taxonomy. They have already discovered a new fish species, *Antilligobius nikkiae*, named after Dutch's daughter, Nicole. The fish, commonly called the Sabor Goby, has been described by James Van Tassell (et al.) of the American Museum of Natural History and placed in the new genus *Antilligobius* within the *Microgobius* group of the *Gobiosomatini*. A second fish found by the sub, the Blue Damsel fish, is currently in the process of zoological study.

It is a complicated dance, manipulating a

submarine so that a 5-centimeter hose can capture a drifting, comatose tropical fish. Fortunately, the water is gin-clear, the current is negligible, and the pair are good at it, with van der Huls using the sub's six thrusters to get them into position, and Dutch firing the quinoline into the right places, then swinging the collecting hose into place—usually right on target over the drifting critters.

There are interesting invertebrates and crustaceans in Curaçao waters. We came upon a poisonous red urchin—*Araeosoma belli*—that Schrier says is of great interest to pharmacological companies, intrigued by the urchin's toxins, which are three times more powerful than that of a rattlesnake.

At the end of our 4-hour dive on the south wall of Curaçao, we finally ascend to a ledge at 55 meters, where we drop the holding bucket, now filled with eight rare deep-water fish. Once we get back to the surface, Schrier throws on his scuba gear, and dives down to the deep ledge, picks up the bucket and brings it 6 meters up the wall. Over the next week, he will descend every day to bring the fish slowly up the reef, acclimatizing them to lower water pressure and higher temperature. He may be a submariner able to dive dry now, but he hasn't lost his scuba diving skills.

Back on dry land, Schrier showed me the ship he is refitting to be used as a tender for the submersible. He has ripped out virtually all the innards of a 40-meter-long boat—currently named the *Chapman* and moored in Willemstad Harbor—and is replacing the systems, wiring, staterooms, galleys, and equipment. Expected to be ready by the end of the year, the ship will be equipped with full diving capability, including a hydraulic crane to lift the sub in and out of the water. The ship is being designed specifically for marine researchers, with capture tanks, computer- and photographic-download stations, and a bridge that will be open to all the ship's guests. Schrier hopes to have scientists sharing their discoveries with nonspecialist travelers on every voyage. ▲▼