

Working in the Dark *can be* Enlightening

The Texas A&M University at Galveston researcher has spent much of his career studying underwater caves all over the world, from the Bahamas to Australia, and along the way he's discovered more than 250 new species of marine life and has probably explored more underwater caves than anyone alive.

Tom Iliffe is especially interested in "blue holes," an underwater cave that derives its name from the characteristic dark blue color of the water and round shape of the entrance. When you fly over one, it looks like a dark, blue dot on the ocean, says Iliffe.

Iliffe is an expert on anchialine caves, a Greek word that means "near the sea." These are caves formed in limestone or volcanic rock that have been flooded with seawater and they include some of the longest submerged caves on Earth.

The study of the caves, their formation and the marine life in them has taken Iliffe all over the world.

"Most of the creatures in these caves lack eyes and pigment, owing their existence in the perpetual darkness of these caves, some as deep as 400 feet and several miles long," Iliffe explains.

Many of the caves he explores are living fossils that harbor life and "these could provide insight into the origin, evolution and movement of marine life. Some of the caves are in the ocean, while others are in coastal mangrove

swamps never entered by anyone. There's a lifetime of work left to study these caves."

Some groups of cave animals were thought to exist just in the Atlantic Ocean, but have recently been found in similar caves in Australia.

"This irregular distribution suggests that ancestors of these animals originally colonized caves several hundred million years ago when Earth's continents were all combined

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Iliffe has collected numerous forms of animal life, mostly crustaceans, such as shrimp and their smaller relatives, which have led to his discovery of more than 250 species, also including worms and fish.

One of his most interesting discoveries, made in the late 1970s: remipedia, a 1- to 2-inch long centipede-type creature that is among the most primitive crustaceans on Earth. "It's been living in underwater caves since the time of the dinosaurs," Iliffe explains.

His many years of diving into the caves has taught him a valuable lesson: it's dangerous work.

"If you're doing normal diving and you have a problem, you just swim to the surface," he says. "But in caves, there is a rock ceiling above your head and often the only way out is the same way you came in. Sometimes you're several thousand feet from the nearest breathable air.

"Also, the underwater currents in these caves can be tremendously strong — so strong that they can create

whirlpools that can suck you in. Many times, we have to wait until the tides are just right so the currents are not so strong, and that leaves us with a very small window of time to do our cave research."

Iliffe has explored more than 500 caves, most of them in the cave-rich Caribbean which he says "has the largest and most interesting caves in the world." The Yucatan Peninsula of Mexico is a particular cave hot spot, one which has thousands of caves that have never been explored, he adds.

"Even in caves that I've been in before, there are often new formations and new life that weren't there the first time," Iliffe says.

"Underwater cave research is fascinating work because you never know what you'll find. One thing is certain: this type of work is never boring." ✍️

Tom Iliffe has never met a cave he didn't like.