

descending against current, traveling to the starting point, or swimming back to the boat or shore. And this is typically in shallower depths where the PO₂ is so low as to be inconsequential. Divers, as a population, really don't work very hard. A lot of overly shrill cautions about reducing PO₂s came from those who had an incomplete understanding of how divers actually dive and what the Navy and NOAA limits were designed for in their original applications.

PO₂s will obviously need to be lowered if your dive plan will exceed 45 minutes at 1.6 ATA. But for you folks on single-cylinder, open circuit scuba, whether breathing air or Nitrox, it is virtually impossible to reach the "dose" time limits.

Breathe Easy

Oxygen has certain well-defined risk windows. But the hazards are easily avoidable by ensuring that your dive profiles observe the NOAA limits. Set your PO₂ at 1.6; watch your computer display your "dose" accumulation, and do not exceed the maximum depth limit for your Nitrox mix. The depth limit for a 1.6 PO₂ exposure on 32-percent Nitrox is 132 feet. If you go deeper, you will not spontaneously combust or go into seizures. But your time limit at increased depths will reduce.

As a general rule, I do suggest observing the 1.6 level for PO₂, but don't panic if you briefly go deeper. Your computer will account for it. And most importantly: breathe in, breathe out, repeat as necessary.

You may also have heard divers refer to tracking their OTUs (oxygen tolerance unit). This refers to another form of oxygen toxicity that occurs on very long exposures at relatively low PO₂s. This is primarily a consideration for saturation divers or dealing with patients in recompression chambers. It is impossible for open circuit divers to attain sufficient OTU dose to serve any practical discussion. If you observe CNS limits, OTUs take care of themselves.

You don't have to take a day off from diving midweek to allow for "oxygen out-gassing," as one reader was told. As Tony Soprano might say, "Fuggitabout it."

Bret Gilliam is a 40-year veteran of the professional diving industry. He founded Technical Diving International (TDI) and crafted the standards and procedures for training nitrox divers for that agency. He is extensively published on the subjects of nitrox, mixed gas, rebreathers, technical diving, oxygen physiology, and emergency treatment for divers in recompression chambers and in remote areas where evacuation is not an option. He is credential as a Recompression Chamber Supervisor and Diver Medical Technician.

Save the Whale Sharks

help them adapt to their new home

For several years, Undercurrent has raised money from our subscribers and donated funds to Seacology, a nonprofit organization that puts its money to work to save the reefs. We have contributed to the building of a school in Fiji and in return, the villagers stopped fishing along a sizeable stretch of reef. We purchased an outboard motor so rangers could patrol a marine preserve in Belize. Seacology's executive director, Duane Silverstein, has developed some excellent projects, and here's another we think our readers should know about . . . as well as a tip on a good guide to take you to where the whale sharks swarm.

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I went to Mexico to play with dominoes, or for the uninitiated, swim with whale sharks. You see, due to the many white spots that mark their gray bodies, the nickname for whale sharks in Mexico is "dominoes." At up to 48 feet in length and 25 tons, whale sharks are the world's largest fish. Comparatively little is known about them because there are not large numbers of them left in the oceans, and for much of the year they are solitary animals.

Finding Diver-Friendly Life Insurance

In our June issue, we wrote how life insurance companies often charge divers high rates. Because they consider divers to lead “risky” lifestyles, they knock them out of the running for a Preferred or Standard policy, which have lower rates, and qualify them only for the pricier ones.

But *Undercurrent* subscriber Michael Horbal (Newtown, PA), owner of Life Insurance Advisors, wrote in to say that there are actually some life insurers with good reputations that are more competitive on rates and will consider divers for policies without charging extra.

“In the past two years, some companies have loosened up their requirements for divers who go deeper than 100 feet (they’re not looking at the standard open-

water certification you got with a 130 foot maximum, but what’s the average depth you go to while diving).

“Genworth Financial Company will offer Standard rates for divers who go to 125 feet. John Hancock will go to 120 feet on a case-by-case basis. How they’ll offer the rate is by considering whether you’re an experienced diver who dives regularly and has your own gear, not if you’re a honeymoon diver who does his dives at Sandals in Jamaica. And if you qualify medically, John Hancock will give you its Standard rate.”

Horbal says Life Insurance Advisors has helped 200 divers get better rates, and that he routinely checks rates offered by the handful of companies that underwrite divers. If you’re seeking a competitive policy quote, contact Horbal (he promises no obligation and no pressure) at www.lifeinsuranceadvisors.com/scuba-diving.html.

Less than 10 years ago, marine biologists discovered that the world’s largest aggregation of whale sharks takes place from June to September near Holbox Island, off of Mexico’s Yucatan Peninsula northeast coast. In fact, *Undercurrent* broke this story in its October 2004 issue. There has been one significant change since then. Though several whale sharks can still be seen near Holbox, the largest whale shark aggregation can now be found one hour north of Isla Mujeres, or three hours by boat from Holbox Island.

I recently visited Mexico to snorkel with these mighty creatures. By law, this experience is for swimming and snorkeling only; no diving allowed. Our guide was Rafael de la Parra (grampusr@hotmail.com). Rafael used to work with whale sharks for the conservation arm of the Mexican government. He has participated in whale shark tagging and research for many years. Rafael and his son, Emilio, are great people, great guides and speak fluent English. Unlike other tour operators, Rafael only charters his boat for groups of 2 to 10 for the total price of \$700.

For several weeks before our July trip, Rafael gave me reports on whale shark sightings. One day he would see 30, the next perhaps 100, and then none. So we had a mix of excitement and trepidation when Rafael picked us up in his boat from our hotel on Isla Mujeres for the 80-minute ride to the whale shark aggregation area. But our worrying was for naught. When we arrived, we counted 170 “dominoes” from our boat. This blew our minds until we came back the next day and counted more than 300. It took us all of 30 seconds to don our snorkel masks and fins and slide into the water. We were surrounded by whale sharks in every direction. All we had to do was wait until a few swam by us. This never took long because whale sharks are filter feeders and must always keep swimming with their very wide mouths open, both to eat and force water by their gills so they can utilize the oxygen.

Other than following us with their small eyes, the whale sharks seemed oblivious to our presence, often swimming just a few feet away. Occasionally while looking in one direction, I would turn around in the water to find a whale shark only inches away, which was rather startling. Rafael yelled down from his boat, “Welcome to my office!”

Indeed, after spending two days with these fantastic fish, I knew my organization, Seacology, must help them survive and flourish. Rafael explained that huge cargo ships come by this area several times a week, sometimes striking the slow-moving creatures. You see, the area does not contain demarcation buoys warning ship captains to stay clear of the vulnerable whale shark population in the water. Rafael wants to deploy a

series of large state-of-the-art demarcation buoys, complete with GPS transponders, to warn ships to stay clear. Once these buoys are deployed, official navigation charts would also denote the area as a whale shark reserve.

Rafael suggested that if Seacology could come up with half of the funds required for this project, many of the local hotels and whale shark tour operators could match this contribution. One doesn't have to be an expert in dominoes to connect the dots to know this would be a worthwhile effort.

If you would like to help protect these gentle giants, visit the Seacology website at www.seacology.org and indicate your donation for the whale shark buoy project. Whale sharks are listed on the International Union of the Conservation of Nature's Red List of Vulnerable Species, meaning their future is in danger.

Jacques Cousteau: The Sea King

Scuba diving has not had a hero since the irreplaceable Jacques Cousteau died. Some graybeards still point to Mike Nelson, but he was a fictitious 1960s TV hero, not flesh and blood, unless you consider the actor who played him, Lloyd Bridges. Besides, the last episode of *Sea Hunt* aired 49 years ago, in 1961.

Cousteau himself has been dead nearly 44 years but he left a profound legacy for every last soul on our water planet. For us divers, he was extraordinarily special, a man whose every TV production we welcomed into our homes. In fact, I fantasized that one day Jacques would invite me to join the *Calypso* crew and sail the oceans. Of course, I never got that invitation, but I did get to meet with him once, as a direct-mail fundraising copywriter, drafting letters for him to sign to acquire new members for the Cousteau Society. He was committed, full of hopes and dreams, surely inspiring to write for. We raised a lot of money for his work, but from the outside, I slowly watched the Society crumble in the 90s. It's a sad story, one of many tales told in *Jacques Cousteau: The Sea King*, the excellent new book by Brad Matsen.

Cousteau struggled through the last years of his life – he wasn't finding buyers for his films, and his family was in uproar when he revealed he had kept a mistress in France, with whom he had two children, while his wife lived aboard the *Calypso*. While Matsen reveals the Captain, warts and all, he brings to life his two exceptional accomplishments: the development of diving gear, and his enormous talent for making films that brought the oceans and its creatures into the collective conscious of mankind. One has no doubt that had there been no Jacques Cousteau, who charmed Ted Turner, the National Geographic Society and others to bring his work to television, our oceans would be in far worse shape. It was no easy task, and Matsen brings us the inner details of negotiating contracts, preparing for voyages and going to sea for Cousteau's film adventures.

Divers will especially appreciate the first third of the book, which focuses on the young Cousteau and his burning desire to capture the sea on film. In the late 1930s, he began filming with an 8mm camera inserted into a fruit jar. Two years later, as a member of the French navy, he worked with others to develop an existing demand regulator and a rebreather, and during most of World War II, he invented and further refined diving apparatus after the French recognized its military potential. After the war, he and his companions, Phillippe Talliez and Frederic Dumas, joined an August Piccard bathyscape expedition, and eventually his photos made it to *Life* magazine, which led to an \$11,000 contract for four documentaries, and a gift from a member of the Guinness family to help him refit an American minesweeper, which he rechristened the *Calypso*. Matsen goes into great detail about Cousteau's development of diving and photography equipment, his outfitting the *Calypso*, and the traumas and joys of his next decades aboard his beloved crafts. It's a great tale of the sea.

Matsen's book (hardbound, 320 pages) is a must-read for any diver. You can order the book via Amazon (it's also available on Kindle) by going to www.undercurrent.org and clicking on our *Sea King* book review, and whatever profit *Undercurrent* accrues from the sale will go to support saving our seas.

-- Ben Davison

