undercurrent®
THE PRIVATE, EXCLUSIVE GUIDE FOR SERIOUS DIVERS

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Critique of World Wide Dive Sites

An update from our readers

Although, I would love to travel everywhere to review and update vacation diving, I do not have the wallet for it. But I must say that the readers of Undercurrent continue to provide a flow of current and accurate information from their travels. In the last six months several hundred readers have sent us comments about their recent trips. The following list comprises those sites about which we previously had insufficient information to report, or where readers have indicated changes in what we had previously reported (C.C., travel editor).

Bahamas: We're beginning to get good letters about Neal Watson's operation on Bimini; people are positive both about Watson's leadership and the quality of dive sites. According to readers, the deep diving and the few sharks you're bound to see make this a spot for the experienced.

Three separate evaluations of trips to the Bahamas in January and February on The Impossible Dream, a boat out of West Palm Beach, are uniformly negative. Divers were critical of the boats, the dive site selections, the food, the crew and, in fact, the entire trip.

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Belize: Ramon's Aqua Safari Lodge, opened in the last year by the ex-Pardise Hotel Dive Guide, seems to be well-regarded by traveling divers. The food and accommodations are average, but according to Frank Barnes of Houston, Ramon is, "the best diving guide on the island -- most of the rest are his relatives."

Silver streak Dive Tours runs a unique trip to Belize's Lighthouse reef, home of the great Blue Hole. Three readers have given it good reviews. The price is $495, including airfare from New Orleans, two nights in the Belize City, all diving, and camping on Half Moon Cay where there are no hotels. The groups, however, have access to a house for cooking or whatever. For information, write Silver Streak Dive Tours, 4211 Melissa Lane, Dallas, TX 75229.

Dominican Republic: Reviews are mixed and a trip there just to dive seems risky. Arvin Zaikaner of St. Paul, MN, reports satisfactory diving, but disorganized shops in Santo Domingo. Richard Eckert of Cleveland, Ohio, reports

disappointing diving at the Club Dominicus' reefs, but a discovery of fantastic diving on longer trips from the Club -- if the guides decide to take you.

Fiji: Air and dive boats are available at Taveuni, or at Do and Ric Cammicks' "Sport Fishing and Diving Resort", and Suva, with the Scubahire Dive Shop, associated with the Tradewinds Hotel, and on Mana. Diving is just about as good as you'll ever find.

France: Sunnyvale, California, Divemaster Dick Overman reported, after several dives along the famed Cote d'Azur of the French Rivera with the Neptune-Pro dive shop at Port Gallice, "there is practically no bottom life (star fish, nudibranchs); only the occasional small octopus in its hole, no coral in water this cold (67 in June) and only a few small fish." Overman said that, "even though the French pioneered the sport, they are at least five years behind us in equipment and technical progress."

Grand Cayman: The best compliment paid to Undercurrent is that those we criticize listen and make changes. Two at Grand Cayman did. Although we loved Spanish Bay Reef, owner-manager, Lach McTavish, still took our comments to heart. A new north sound mooring will permit more trips to the North wall, the C-card checks are being tightened, and two new boats are on the way. Bonnie Charles has been hired to work with Atlee Evans as divemaster, a swimming pool is under construction, and the dessert menu has been altered.

When we visited the Tortuga Club in January we were not pleased, but we noted that new owners were taking over. Ben Vernazza, one of those owners, wrote us about the changes he has made in the last four months. The accommodations have been cleaned up, the rooms painted, and new mattresses, sheets, towels, etc., provided. The menu has been revised and upgraded considerably. A tennis court is being built, the driveway paved, the junk cleaned up, and a new pond has been built for the captive turtles. As for the diving, a 34-foot diesel-powered boat will soon be put into action, and a new dive master -- O.J. Holden from Vero Beach, FL -- has been hired. There will be daily two-tank dives in the morning, and afternoon or night dives, if enough divers sign up. A fully equipped dive shop will be constructed and NAUI certification will be offered. New hotel and dive rates will provide a much greater value than previous rates. Summer prices will be 35 percent lower than last year's winter rates.

Of course, Undercurrent has not visited the revamped Tortuga Club, and we have yet to hear from readers traveling there. But after a long telephone conversation with Vernazza, it appears that the Tortuga Club will at last get the tender loving care it deserves and may earn several stars on the Grand Cayman tourist map. The setting is lovely, the reefs excellent, and the total potential is indeed attractive. If Vernazza's plans materialize, then the Tortuga Club will become a fine choice for serious divers.

As for Cayman Brac, which we reviewed in July, 1977, and then updated with a letter from the management in the November-December issue, we continue to hear of serious problems with the dive operation management. The complaints of Undercurrent readers who travel there suggest that if you are headed to Cayman Brac to scuba dive, expect grave disappointments.

Dive Cruises: We get continual raves about dive trips sponsored by See

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and Sea Travel. Divers feel well taken care of, they get to the best diving available, and they appreciate the careful organization of the trip. Although See and Sea trips run as much as 20-30 percent higher than other trips to the area, owner Carl Roessler points out that his cost per dive is much less than what one pays at a typical resort, where two dives per day is the rule. Divers on See and Sea boat trips make 3-5 dives a day and, if weather or visibility becomes a problem, they simply move on. Trips to the Philippines and to Belize seem well regarded and a forthcoming trip to Sri Lanka and the Maldive Islands will visit reefs no diver has ever seen. Write Roessler at 680 Beach Street, Suite 380, San Francisco, CA, 94109.

Maldive Islands: Undercurrent readers, Dr. William and Celeste Bastendorf, write that the Rannali Resort, on Southmale Atoll, has well organized, guided diving in some of the most virgin waters in the world. Accommodations and food are adequate, but unbroken coral, and fantastic beach or boat diving among every imaginable underwater creature keeps the divers attention. If your travel agent can't find the club, write Subex International c/o Rene Galster, Bentenstrasse 31, CH-4123 Allschwill, Switzerland.

Mauritius: Reader Drew Anderson, of Staten Island, New York, liked the diving and suggests staying at the Le Morne Brabant Hotel, and diving with guide John Smith. No spearing, but plenty of shells.

Roatan: We have received letters saying although the package deals at Anthony's Key supposedly include night dives, it is $15 extra once you arrive. Check it out before departure.

St. Croix: Guided tours are most often beach diving tours or trips to beginners' sites at Buck Island, but now V.I. Divers visit different sites with their new 40-foot dive boat. Shop owner Bret Gilliam has a pleasant and personable staff and now that new sites are available, St. Croix tours deserve further consideration by experienced divers. The best second choice, according to our readers, seems to be Caribbean Sea Adventures, run by Larry Angus, which operates out of the Buccaneer Hotel. B. Max Friedman, of Pressure Ltd., is a competent guide, but readers continue to report being put off by his put ons.

Tahiti: Hotel Bora Bora offers extraordinary diving from the hotel front. The accommodations are very expensive, but it's one of the best hotels anywhere. There is also diving out of the Kia Ora Hotel, on Rangiroa, in the Tuamoto Archipelago.

Cozumel, Mexico: Revisited

Is the downward trend reversed?

Diving Palancar reef off Cozumel (a small island off Mexico's Yucatan peninsula) three years ago, did more to turn me into a serious diver than anything else. The magnificent wall, the caves, the arches, and the fish life were stunning. But what I saw above the surface left me cold. Disorganized dive shops, rented tanks with missing o-rings, broken back packs, and boats departing an hour or two late were commonplace. On first glimpse, their dive-cum-cargo boats seemed charming, but they were slow, dirty, and cramped. The divemaster speared lunch, and the captain, on the return trip, dumped the garbage and beer bottles overboard. From our boat we could watch nature divers daily spearing lunch for 50 people on tourist cruises. They speared everything from groupers to parrot fish to, would you believe, french and queen angels. No wonder the Cozumel fish population has declined dramatically.

This spring I made my eighth trip to Cozumel to determine how this noted sport diving center could allow itself to sink toward the ruin of its own prosperity. I

was surprised to see that diving is improving. Fish are slowly returning to the reefs. The daily spearing has slackened. Empty bottles are no longer tossed overboard. And some of the dive shop operators have begun to clean up their acts. There are even plans afoot to introduce flat top platform diving boats. Regardless of this, problems remain.

First tourism continues to grow. Huge hotels and condominiums are under construction. More are planned. Guess where they dump their sewage? Right. But fortunately, the current runs in the opposite direction from Palancar and nearby reefs. These big hotel owners are largely absentee landlords out to make money. And they have a lot of support among the island's merchants and people who are cleaning up financially on the tourist boom, and who could not care less what happens in the long run. In short, Cozumel is threatening to become another Acapulco.

The second problem is the boat owners and operators union. Strong, with political connections, and capable of strong-arm tactics, they cling to the old ways and have been especially resistent to the introduction of modern diving boats, which they see as a threat to their own livelihoods. There are about 35 old boats in all -- usually half of them aren't running on any given day. Breakdowns are frequent. Getting them to modernize has been a painfully slow process. But the dive shop owners say that they are making some progress.

Progress with the dive shops themselves has been somewhat uneven. My experience with Discover Cozumel, run by Ernesto Vera, was dissatisfying. Three mornings in a row there was confusion at his shop as divers gathered. And waited. And waited. Even though the union boats were at the pier on time, mine always left at least 45 minutes late. Each day, we had to stop enroute to Palancar to pick up extra gear. Boats, which usually hold eight divers comfortably, were crowded with fourteen. Some people still swear by Ernesto. I swear at him.

Down the street, Dick Tompkins has moved Aqua Safari into spacious new quarters, with their own boat dock, out front. They run an efficient operation, limiting themselves, even during peak season, to 45 divers per day, but usually they have only one or two boatloads. Each boat carries a portable oxygen unit in case of trouble. Aqua Safari, like most of the other dive shops, now buys commercially-caught fish for lunch. "But the hotels still spear on the stupid Robinson Crusoe tours and it's criminal," said Tompkins.

I didn't dive with well-regarded Julio Blanco, who runs a one-man operation, or with Damian Piza, the famous Mexico City swimming champ, (he was a double in some Tarzan movies) who opened a dive shop in January. That leaves one more dive shop, Scuba Cozumel. It turned out to be the most pleasant surprise of the trip, and its owner, Pedro Delgadillo -- in this diver's opinion, of course -- is the best thing that has happened to Cozumel diving in a decade. Pedro and his wife, Marta, built a small hotel, called the Galapago Inn. It's on the waterfront south of town, and is the only hotel with a daily working dive shop on the premises. That means great advantages for the diver. First, I didn't have to rent a car -- for $24 per day -- in order to haul me or my gear back between a beach hotel and the downtown shops and main pier. Second, the union dive boats pick up and deliver divers at the hotel. Furthermore, instead of the nearly two hour one way trip from the pier to Palancar, Pedro can make the trip in 30 minutes with his 22-foot Aqua-Sport speedboat which holds six divers (he isn't saying how he got the boat union to accept this revolutionary advancement). Third, the Galapago is the only hotel on Cozumel where you can walk a few steps out of your room, rent a tank, and dive off the dock. The depth is only 15 to 25 feet, and bottom is mostly flat grasses and an occasional baby coral head. But it turned out to be a wonderful place to take closeups of morays, small rays, scorpionfish, arrow crabs, and small reef fish.

It was Pedro who took me to see the decompression chamber, which is located at the hospital, behind City Hall. He doesn't know who paid for it, but the theory is that some wealthy man, whose son died in a diving accident in Cozumel, just shipped it there anonymously. It is a 1975 two person chamber manufactured by Saturation Diving Systems. At the moment, it uses air, not oxygen mixtures, and its four compressors are capable of taking the chamber down to 165 feet. Since November, 1976, it has been used to treat seven cases of the bends, including one local diver who died after three consecutive dives to 90 feet. Pedro learned to operate it from a Costa Rican doctor. Pedro has been giving instruction on the chambers' use to local physicians, but he is looking for a trained U.S. doctor who speaks Spanish to hold intensive courses. He believes that the local dive shops would gladly foot the bill.

At the moment, virtually all the dive boats head daily for the southwestern coast of the island, where Palancar and other reefs are located. Depending on how lazy the boat captains or divemasters are, your boat could end up at the nearest end of Palancar or, if you're fortunate, you might end up diving a less frequently visited part of Marcaibo Reef, farther away. Usually, however, a dozen or so boats are bunched up within 20 or 30 yards of each other. And that means a situation below that occasionally, reminds one of the Calcutta railroad station.

Below, barracuda were rare, but are beginning to reappear. The reef still has the biggest and most gentle french, gray and queen angelfish I have ever photographed. And a few large groupers have started hanging around again, as do big rainbow and midnight parrotfish, as well as unsually large filefish, cowfish and trunkfish. No sharks, and only a couple of stingrays on this visit.

Shops are considering visiting other nearby dive sites. Palancar has always been the big draw, but after a few days many divers would like to check small reefs or cruise over to the Yucatan for exploratory dives. Scuba Cozumel and Aqua Safari are considering live-aboard boats to cruise the reefs along the Mexican coast south of Cozumel toward Belize, or to head northward past Isle Mujares to Chinchorro Island, where giant mantas are said to abound.

These are only small signs that the Cozumel diving community has begun to pull its' collective head out of the sand, but the conscientious people may still be overwhelmed by the fastbuck artists. Palancar and surrounding reefs were declared a National Park of Mexico last year, but they haven't received a peso for enforcing protective rules. That means the Cozumel diving community, and more importantly, YOU and every other diver who goes there, must help protect and preserve this once-wonderful place.

Comment: From time to time we will update areas previously reviewed, if changes merit a second visit. Cozumel was reviewed in the January, 1977, issues of Undercurrent to which you should refer if you are contemplating a trip.

(C.C., travel editor)

Why Divers Die

An analysis by NAUI

In the July, 1976, issue of *Undercurrent*, we reported an analysis of diving deaths conducted by University of Rhode Island faculty members, Hilbert Schenck and John McAniff. The University of Rhode Island study provides excellent data for analysis, yet suffers from one shortcoming which the authors themselves recognize: the cause of the accident. For example, determining that a diver dies from embolism does not always tell us enough. Did he panic? Was he drunk? Did his equipment malfunction? To understand why he died, the question is "what was it that *caused* him to embolize?"

The Director of NAUI, Jon Hardy, and several volunteers studied 700 accident reports on file in NAUI headquarters. Training accidents were reviewed separately from nontraining accidents. Eight significant categories of causal factors were identified. With Hardy's permission, we are publishing the study, which first appeared in the proceedings of the 1977 IQ 9 convention. *Undercurrent* has edited the text and takes full responsibility for any changes.

The data was developed after reviewing all available diving accident reports and determining each factor that seemed to contribute to the accident. Due to better, or more complete reporting from some states, and many incomplete reports from which judgments had to be made, the study does not meet rigid scientific standards but it does provide a valuable analysis of the causes of diving deaths. The exact order of the causes — i.e. whether a cause places first or third — is unimportant. What is important is recognizing these are the causes of diving accidents, and most, as you might expect, are preventable.

Medical and Psychological Factors

Decompression sickness (the bends) was the most common nonfatal accident reported. The following observations were developed from a review of the cases.

- ★ Most cases were not fatal.
- ★ Most victims were experienced divers.
- ★ In most cases the diver exceeded U.S. Navy Tables, but in some cases the diver was well within the no decompression limits.
- ★ People over 35 and those in poor physical condition seemed more likely to get bent.

An effort was made to review possible problems with the use of decompression meters in bends cases, but insufficient data was available. If a meter was abused or not maintained, or if a diver failed to understand the limitations of the meter, or if a diver used a meter without using a depth gauge or a watch, then a diver could expect problems.

The use of drugs, including alcohol, seemed to increase in the more recent accidents. We are unsure whether this is a function of more complete reporting or whether it reflects an increased use of alcohol or drugs, before diving, which, obviously, predisposes a diver to accidents.

In nearly all of the cases where medical problems were reported, the diver should not have been diving. Many victims were taking regular medication, had respiratory impairment, ear and sinus problems, were epileptic, or were recovering from a recent operation, illness or injury.

Bad air was the least significant cause in this category. This figure could be low due to incomplete reports, or to the failure to analyze air after an accident, but it seems that, at least in this country, bad air seldom figures in a fatal accident.

In these accidents, a common chain of events often occured. The diver was cold or tired. His stress and anxiety increased. He made a mistake, then panicked, and the accident — and often death — followed. The key link to understanding the accident is that the diver erred, and that error could have been avoided. Whether entering a prohibitive surf, or failing to maintain a buoyancy compensator, the cause of a diver's death was usually avoidable.

Recommendations: Divers need to stay fit, take regular medical exams, follow a good diet, and especially before a dive, be rested and avoid drugs and alcohol.

Before students are permitted to enroll in a class, instructors need to screen carefully their medical history and to understand the potential physical and psychological condition. When needed, the instructor should require medical exams and an evaluation of water skills and endurance. More students ought to be disqualified from taking diving courses. Then, once enrolled, students ought to be well-schooled in the medical and psychological reasons not to dive. During diver training, the conditions need to be controlled to avoid excessive stress, cold, or fatigue.

Dangerous Environmental Conditions

Surf in California and caves in Florida are major problems. Ice and obstacles (e.g., trees, ledges, debris) are significant fresh water problems. Diving beyond any reasonable sport limits — 200 feet or more — obviously contributes to deaths.

Frequently, a diver faced one or more problems which normally he might have handled, but because he was ice or cave diving, or negotiating a heavy surf, the effect of the problem was multiplied by the dangerous environmental condition. Most cave or ice diving victims had not been properly trained, or were not properly equipped.

Recomendations: Sport divers should be discouraged from cave and ice diving until they are properly equipped and have had special training.

Instructors should not expose student divers to conditions beyond their ability. If conditions are adverse, instructors should cancel dives and explain to the students the reasons for their decision. Students need to develop an understanding of the danger of adverse conditions and the importance of deciding not to dive under these conditions.

If normal, local conditions include surf, current, or low visibility, then instructors have an obligation to teach students how to cope with these conditions. The conditions must be controlled and the instruction must include close supervision.

Buddy System Failure

Diving alone does not kill divers, but being alone when something goes wrong makes it more difficult to escape safely. For example, any of these fatal accidents might be prevented with a buddy at hand: entanglement, out-of-air, bad air, heart attack, equipment difficulty, cramps, ruptured eardrum, fatigue, nitrogen narcosis, decompression sickness, head injury, regurgitation, and air embolism.

Recommendations: Not only do instructors need to teach the critical importance of the buddy system, but also they must teach how to find and select a buddy, how to stay together when diving, and how to make buddy diving easy and enjoyable.

Equipment Difficulties

Usually equipment failure did not appear as a primary cause of trouble. Most equipment problems stemmed from the improper selection, use, or care. Dives can be made without certain items of equipment, but in some accidents the diver's life could have been saved had he been using certain equipment. In these cases, missing equipment which, if available, might have saved the diver's life included; submersible pressure gauges, bouyancy control devices, protective suits, snorkels, depth gauges, compasses, and watches.

Misuse of equipment was the most frequent equipment difficulty. Specific problems included:

- ★ Regulators attached incorrectly
- ★ Back packs mounted improperly
- ★ Quick release buckles not used on weight belts or scuba straps
- ★ Weight belts not clear to be ditched
- ★ Snorkels not worn on masks (in a strong current this may be an acceptable procedure, but not under most conditions)
- ★ Spearguns loaded out of the water
- ★ Divers using BC's as lift bags
- ★ BC not maintained or checked out
- ★ BC not inflated for surface resting
- ★ Air partially or entirely off
- ★ Cylinders not internally inspected
- ★ Valves not serviced
- ★ Torn or ill-fitting wet suits
- ★ Fin straps not properly buckled or secured
- ★ Overweighting and/or overinflation of BC
- ★ Improper positioning of the reserve valve
- ★ No regulator maintenance or home maintenance

Some equipment difficulties developed from not knowing how to use the equipment, perhaps because the diver was not taught how during training, or because he was using equipment that was not available during his training, or he forgot what was taught, or he was using unfamiliar or borrowed equipment.

Recommendations: Diver training needs to provide a better understanding of equipment and how to use it. Specifically the following should be emphasized:

- ★ Selection of proper, complete and quality equipment for the particular diving activity and the diving environment.
- ★ Proper preventive maintenance by the individual diver and regular professional maintenance of life support equipment.
- ★ Use of new or unfamiliar equipment only with training or under controlled conditions
- ★ More training on weights and buoyancy control systems.
- ★ Refusal to loan equipment to untrained divers.

'In nine out of eleven fatal accidents, the victim had not used the reserve when the air ran low. Rather, he panicked and headed for the surface.'

Low or Out of Air

Many divers had no submersible pressure gauge or reserve. Of those divers who did have a gauge, many did not use them. Although it was uncommon to find air not being turned on, when it wasn't fully turned on several unfortunate accidents resulted.

One of the more surprising findings of the survey was the misuse of the reserve. In nine out of eleven fatal accidents, the victim had not used the reserve when the air ran low. Rather, he panicked and headed for the surface.

We found 93 accidents resulting from the diver running out of air. In 37 percent the diver made an independent ascent to the surface, in 33 percent the diver surfaced with the assistance of a buddy; in 30 percent the diver was unable to surface — he panicked, he was overweighted, he was entangled, he was in a cave, or he was under ice.

Recommendations: When divers are low on air, tired, cold, near the end of the dive or in deep water, they may increase their respiration rate. This, unfortunately, is exactly the wrong response.

Training needs to emphasize slow, deep, relaxed breathing. Divers need to avoid panting into the regulator. Instead they must learn to relax. They need to keep 300 to 600 psi for surfacing. They need to understand the use of both submersible pressure gauges and reserve warning mechanisms. They need to verify that their air valves are turned on all the way, and that they have double checked the functioning of their reserve, their regulator, and all their gauges. They need to be trained better in buoyancy

control and ascent procedures. They need to understand more fully the dangers of deep diving.

Ascent Difficulties

Accidents were occasionally reported as occurring during normal ascent, although it is possible that ascents were not normal, but only reported as such. Although the reports were without direct evidence, causes of problems in normal ascents could include respiratory impairment from heavy smoking, recent cold or infection, or previous lung disease. Although it was possible that a greater number of accidents involved air embolism, we made no attempt to ascribe the accident to embolism unless explicitly stated.

Forty-six accidents occurred during buddy breathing ascents. Ninety-three percent came after the buddy breathing was aborted and the diver switched to a swimming ascent, 35 percent resulted from disorientation and panic, nine percent from a struggle over the regulator, nine percent from the inability to clear the regulator, and seven percent when the donor ran out of air.

Recommendations: Whether buddy breathing should be employed in an out-of-air situation is controversial. It is a difficult skill to learn and maintain and often appears to be unsuccessful. The frequency of successful buddy breathing ascents is unknown, but an informal survey of emergency ascents, by experienced divers, disclosed that independent emergency swimming ascents were by far the most common and successful technique employed. Buoyancy and octopus ascents were the next two cited. From our studies we make these recommendations, in order of preference, for diver ascent.

1. Make a normal ascent after stopping activity, breathing easily and getting control of the situation.

2. Make a shared air ascent using the buddy diver's extra regulator if the buddy is so equipped, and if the buddy is closer than the surface, or if there is an obstruction to the surface — ice, cave, wreck, heavy kelp, etc.

3. Make an emergency swimming ascent in a manner as near to a normal ascent as is possible: looking up, regulator in mouth, swimming a bit faster, exhaling more and inhaling less (lungs at near normal volume).

4. Make a buoyant ascent by ditching weights and/or inflating the buoyancy system; with regulator in mouth, looking up and exhaling more rapidly.

5. Make a buddy breathing ascent only when the other options are not available.

Ascent techniques are an important element of diver training. To respond to the problems inherent in ascent training by not including the training in a certification course, would only transfer accidents from training to post certification diving. The diver untrained in ascents would be far more susceptible to a serious or fatal accident than his trained counterpart. The result would be more diver deaths. To teach ascents more effectively and safely, the instructor should:

- ★ Provide lecture coverage on all forms of ascents used by sport divers.
- ★ Provide pool or shallow confined water training in normal, octopus, emergency swimming, buoyant, and buddy breathing ascents. Several of these procedures can be practiced horizontally.
- ★ Provide stationary open water training of normal ascents, octopus ascents, emergency swimming ascents, and buddy breathing ascents.
- ★ Provide complete training in lecture, pool and open water on buoyancy control during ascents, descents, at the surface, at the bottom and in midwater.
- ★ Make all open water emergency swimming ascents as similar to a normal ascent as possible, i.e. with the regulator in the mouth, looking up, ascending slowly, and exhaling more and inhaling less, keep lung volume as near normal as possible.
- ★ Have divers look up as much as possible while making all ascents.
- ★ Make careful use of medical history forms with medical exams and chest x-rays when needed, plus take special care with any student who has recently had a cold, or is a heavy smoker.
- ★ Provide close supervision during all ascent trainings.

In open water training, students should not:

- ★ Make any ascent that cannot be stopped, or high speed ascents, such as a buoyant ascent.
- ★ Make free ascents or undertake "blow and go" ascents.
- ★ Have air turned off.
- ★ Breathe off BC's.
- ★ Buddy breathe vertically.
- ★ Take the regulator out of their mouth during ascents.
- ★ Make anything but normal ascents from depths greater than 40 feet.
- ★ Be under pass/fail stress during ascents.

These are the best recommendations available after repeated review of the available accident reports, but far more research needs to be done on ascents.

'Whether buddy breathing should be employed in an out-of-air situation is controversial. It is a difficult skill to learn and maintain and often appears to be unsuccessful.'

Entanglement

Entanglement is a more significant cause of accidents than one might imagine. In our study it contributed to seven percent of the accidents. Kelp, in California, weeds in lakes, fishing lines, nets, anchor and safety lines in all waters are problems. Some accidents resulted from divers getting entangled in their own equipment.

Recommendations: Buddy diving, use of a good knife, and skills in handling equipment underwater are ways to deal with entanglement. More controlled open water diving under the supervision of an instructor would increase diver skill and confidence. The diver would learn to avoid entanglement or to deal with it calmly.

FACTORS CONTRIBUTING TO DIVING ACCIDENTS

	General Diving	Training
Medical and Psychological Factors: Decompression sickness, fatigue, drugs, heart trouble, stress, medical problems, cold, cramps, poor fitness, bad air.	797 cases 20%	118 cases 34%
Dangerous Environmental Conditions: Surf, caves, deep, currents, visibility, ice, obstacles.	19%	20%
Buddy System Failure: Loss of contact, diving alone.	14%	14%
Equipment Difficulties: Misuse, lack of knowledge, trouble with regulator, lack of needed equipment, unable to use.	13%	10%
Running "Out-Of-Air": "No-air", reserve misuse, air not on.	11%	9%
Ascent Difficulties: Buoyant, emergency swimming, buddy breathing, normal.	10%	7%
Entanglement: Kelp, weeds, lines, nets, equipment.	7%	3%
Buoyancy Control Problems: Overweighting, not wearing or using BC, BC not functioning.	6%	3%

Buoyancy Control

Although improper buoyancy control was a factor in six percent of the general deaths and three percent of training deaths, we suspect the figures would have been substantially higher had the reports been more explicit. Its importance cannot be discounted.

Wearing too much weight is an increasing problem. Some divers wear excessive weight, then correct their buoyancy by inflating their compensators. This is particularly a problem when noting that no victim in any of the fatal reports had successfully dropped his weights, the weights had to be dropped by a rescuer. Some weight belts or weight systems did not release when the victim or the rescuer attempted to ditch them.

Few victims in these accidents had inflated their own flotation devices. Some divers did not use vests or compensators, others did not use adequate devices, and still others had not maintained or checked their devices.

Recommendations: Divers should weight themselves for neutral buoyancy at their most common or shallowest depth. The study revealed, as one would expect, that if a diver inflates his flotation device, or rids himself of his weights so that he is able to float on the surface, then a possible fatal accident is converted to a near miss.

Instructors need to provide more buoyancy control training, including repeated use of conventional BC's and weight belts, and introductions to other buoyancy control systems such as back packs, back inflation devices, and the newer vest models.

Other Variables

Depth of Accident: Twenty-six percent of the accidents *started* while the diver was on the surface. Obviously, safe diving must be practiced from the second one dons his gear and enters the water. Forty-three percent of the accidents occurred in depths up to 60 feet, 22 percent from 60 to 130 feet, and nine percent occurred deeper than 130 feet.

Experience of the Victim: Fifteen percent of the reported accidents occurred in training (a study by the University of Rhode Island found that nine percent occurred in training); 36 percent occurred in a diver's first year or during his first twelve dives. Although 14 percent of the divers were untrained, the percentage is decreasing; most untrained victims appeared in the earlier reports. Accidents where nondivers were being trained by friends (not by instructors) are still common.

Twenty percent of the accidents involved divers with one-to-three years of experience, or with 12-48 dives; 15 percent of the accidents involved divers with more than three years of experience, or with 48 dives.

Conclusions

From this report, the following recommendations can be made for certified divers:

- ★ Know when *not* to dive; know when to abort the dive; never be embarrassed to do either.
- ★ Stay out of dangerous water conditions.
- ★ Get a regular medical exam and maintain physical fitness.
- ★ Buddy dive conscientiously with agreed upon procedures and a dive plan; know hand signals and each other's equipment; stay together.
- ★ Get complete quality equipment and maintain it well.
- ★ Know and use the equipment and procedures to avoid or handle running out-of-air, making emergency ascents, getting entangled and decompression.
- ★ Control buoyancy to make diving easier.
- ★ Get out of the water if cold, tired, hurt, out of air, or not feeling well.
- ★ Take an open water or advanced course.

From the report, the following recommendations can be made for the modifications of diver training courses:

- ★ Controlled open water training under a variety of conditions, supervised by an instructor.
- ★ Careful medical and physical screening of student divers.
- ★ Emphasis on practical open water skills, particularly equipment handling, buddy diving, buoyancy control, dive planning and ascent procedures.
- ★ Emphasis on the prevention of fatigue, stress, getting cold, running out-of-air, emergency ascents, entanglement and decompression sickness.
- ★ Training in the environmental, medical, physical and psychological reasons when *not* to dive, when to abort dives and when to limit diving under certain conditions.
- ★ Emphasis on diving with complete, well maintained, high quality equipment.

The Seatec Bluefin Buoyancy Compensator

Another new BC design

In our April, 1977 issue, we reviewed two new flotation devices, the *Scubapro Stabilizing Jacket*, and the *U.S. Divers' Calypso Compensator*. We found the two designs clearly superior to the traditional horsecollar compensator, and although similar in some ways to back flotation devices, the new designs are safer because they keep the heads of unconscious divers out of the water.

We expected other manufacturers to follow the lead of *Scubapro* and *U.S. Divers* and now, *Seatec* has marketed the *Bluefin*, a flotation device with similarities to both predecessors. The similarities are such that both *U.S. Divers and Scubapro* considered bringing suit against *Seatec*, but have dropped the idea. We asked our Captain Nemo, who performed the April, 1977 study, to put *Bluefin* to the same tests. Here is his report:

"A deflated *Seatec* vest, at first glance, may appear identical to the *Scubapro* model because of its vest-like appearance. The diver dons the device by placing his arms through two holes. Unlike the *Scubapro* vest, however, the model does not inflate under the arms. The flotation runs over the shoulders and down the back, similar to the *U.S. Divers'* model. But because only one buckle is required to tighten the vest, it is easier to don the *Bluefin* than its *U.S. Divers'* counterpart.

The inner bag is urethane and provides forty pounds of lift in salt water; the outer bag is durable condura nylon, which *Seatec* calls *Tough Tiger*. On the right hand side, in front, is the dump valve, and on the left is the oral inflator hose and the low pressure hose for automatic inflation. It is the only wraparound model on the market with a pocket, which is located on the left side. The first models came equipped with a 16 gram CO_2 cartridge, but the newer model will carry a 25 gram cartridge.

Water Performance

With my *Seatec* fully inflated on the surface I floated upright, tilted slightly backward. The degree of tilt was a function of the position of my tank. Laying on my back, I could easily kick out several hundred yards to a reef. That position, of course, provides a major advantage to these new designs or the back flotation design, compared to the standard horsecollar BC.

With the device fully inflated, it was difficult to roll over to a horizontal swimming position. When deflated to provide just a few pounds of buoyancy, the air in the front pocket would flow to the backside as I leaned forward to snorkel. Snorkeling was relatively simple, and because the tank pack can be

easily removed, the *Bluefin* can be used for free diving if one desires.

I sank to the bottom, relaxed, then activated the automatic inflator for a controlled trip to the surface. I surfaced upright, my head completely out of the water, and tilted slightly backward. I was positioned just right for towing or for mouth-to-mouth resuscitation.

With the inflated unit attached to a tank, some divers toss it into the water and jump in afterwards to dress up. Donning the device in water was difficult at first, until I learned the trick. Because there is no flotation under the arms, the waist belt is free to move in the belt loop so that the vest may flex and not restrict the diver's body. But the slipping belt may require a search and the helpful hand of a buddy might be required.

Maintenance

Of course maintenance of the *Bluefin* is identical to maintenance for any B.C. Washing out the inside of a double bag is especially important because if salt water is allowed to dry, the resultant salt crystals can cut the bag. Furthermore, dropping or placing heavy objects on a folded bag can pinch the inner bag and damage it.

If the bag is punctured by carelessness or a swimming sea urchin, it must be returned to the factory for repairs; that costs $7.50 plus postage. *Seatec* soon expects to introduce a traveling repair kit. However, Mark Janlius, of St. Petersburg, FL, in a letter to the Editor of *Skin Diver*, said he repairs his B.C. bladder with *Eastman 910* adhesive and a couple of bladder scraps picked up from the floor of his local dive shop. It's worth a try.

The list price of the *Seatec Bluefin* is $230, complete with automatic inflator and backpack. Because it fits just about any backpack which can be disassembled, a diver can save $20 by purchasing it without the pack and using his present backpack. The *Seatec* price can be found discounted in dive shops. We were able to find it in one shop for $179 with the backpack, and in another shop for $159 without the backpack.

SURFACE RESTING POSITION WITH THE SEATEC BLUEFIN

Recommendation

If price were no consideration, we would prefer the *Scubapro* model. But it lists for $260, a price seldom discounted, and it must be purchased with the backpack. We found little to merit spending an extra $100-$120 for the *Scubapro Stabilizing Vest*. In fact, the only significant difference we found was that in rolling over in the water a slight shift of air in the *Seatec* made an additional effort necessary to complete the roll. A $10 objection — yes. A $100 objection — no.

Yet some people may find the shift annoying, so it makes sense to test the compensators in a pool prior to purchasing. Most shops will let you test the devices and you may be able to rent one for open water testing. The *Scubapro* model has one distinct advantage over the *Seatec*. It comes in two sizes. Larger or smaller people may find it more suitable. That's another reason to test before investing.

The *U.S. Divers'* model lists for $176.75; We found it with a backpack at $139. Although $40 more, we prefer the *Seatec*. There is no restriction of head movement, as in the *U.S. Divers Calypso*, and the *Seatec* single-buckle system is a breeze compared to the complex harnessing of the *U.S. Divers'* device.

In essence, the models of all three manufacturers deserve a share of the marketplace. But in our opinion, the best dollar value is the *Seatec Bluefin*.

Dive Tours and Divemasters

Liability looms large

As the travel editor of *Undercurrent*, I'm amazed at the number of dive tours being run these days. I read the ads in *Skin Diver* and *Sport Diver*. I see the signs in dive shops everywhere. I get flyers in the mail, and I even see classified ads in my local newspaper.

Now, there are plenty of legitimate agencies running tours — *Poseidon Ventures, Windjammer Tours*, and *See and Sea* are examples of nationally recognized operations. They don't concern me. I'm concern-

ed about *George the Diver*, who wants to get to Bonaire for no cost and so organizes a group of fifteen. I'm concerned about *Houdini's Underwater Adventures;* after I pay my money to Harry, he disappears. I'm concerned about *Mr. Sam's Scuba Safari* which offers to get me to Micronesia, but once I'm there I learn that Mr. Sam can't find the reefs — it's his first trip too.

I don't know who most of these new tour operators are, but I do know that anybody who organizes a tour of 15 or so people, and goes along as the leader, pays nothing for his air fare, accommodations, and diving. And if he jacks up the price he can also make a few bucks for himself. Now isn't that an inducement for you, yourself, to find fifteen people and head off somewhere? All you must do is write the airlines and dive spa, get their commission on freebie on paper, pick your week, and find the people. What a great way to go.

Well, before *I* join up with *George the Diver* and his budget trip to Bonaire, there's at least one thing I want to know. Is this guy George qualified to be my dive leader for a week? I want to talk to him. If he hasn't got a long track record, then I want to see his credentials. If he is not *at least* a divemaster (better yet, an instructor) certified by PADI or NAUI, then I'll take my own trip to Bonaire.

Just because your leader is a divemaster, however, doesn't mean that the trip will pan out. First, he has got to be skilled at organizing a group. If he's a divemaster, he should have learned in his course how to organize and take care of a group of unruly divers. If he's not a divemaster, then he should have learned this through his experience in organizing other trips. Second, he ought to be well-versed in the destination and the diving. If he's simply organizing the effort to get you to Bonaire and then turns you over to Peter Hughes or Cap'n Don, you can expect to get to the good diving because those folks know the reefs. On the other hand, if your tour leader runs the boat on Bonaire and, never having been there before, searches for the reefs by trial-and-error, you'll be one unhappy tour member.

Now a good dive leader doesn't have to be a divemaster or instructor to find the reefs, but another item strikes me as significant — the leader's personal liability for his misdeeds. A divemaster certified by NAUI or PADI is not only an experienced diver, but has had to pass examinations in cardio-pulmonary resuscitation, lifesaving and first aid. That means he's been trained to take care of problems. Secondly, divemasters are eligible for liability insurance. If there's a serious problem to which the divemaster contributes, if he has been sensible, then he is insured to cover it.

If you're considering leading group tours, then the question of your liability ought to have a simple answer: get certified as a divemaster or instructor and get insurance. It's just about impossible to get reasonable coverage for personal liability through any policy other than that of a certifying agency. Given the frequency and size of today's liability judgments, I would worry myself silly if I were leading tours of people who paid me and I was not adequately insured. Whether I take along strangers or neighbors, if I misjudge the tables and one of my charges get bent, I can expect a suit asking to cover his medical costs, plus a few hundred thousand for pain and suffering.

Getting a divemaster certification is not difficult. The courses are offered frequently in nearly all the states and Canada. PADI courses are usually individualized. The student assists an instructor in ten open water certification dives, and is specially trained in rescue capability and the organization and management of group diving. The NAUI course has three parts: the techniques for running safe dives, a certification seminar, and eight open water dives as an assistant to an instructor. The course is taught to groups. Successful completion of either course qualifies one for NAUI or PADI insurance which, for $300,000 in liability, costs but $70 per year. I would never lead a group tour without it. You can get information on divemaster courses by talking to instructors at your local dive shop, or write PADI 2064 N. Bush St., Santa Ana, CA 92706, or NAUI Box 630, Colton, CA 92324.

Finally, think about this. If you lead a trip to Bonaire and you take no commission, but instead make a free trip, you have a federal tax liability. The IRS says your free air fare, accommodations, and diving are taxable income. You might get away without declaring it the first time, but if you make many free trips, you'll have a tax bill after your next audit.

Running dive trips is no simple business. Before you sign up, make sure you know enough about the agency or the leader to feel comfortable. And before you become a leader yourself, consider the liabilities. You may wish you paid your own way like all the rest of us.

In a story about a bent diver airlifted to a recompression chamber, the *Atlantic City Press* reported that she had been transported to a "hyperbolic oxygen chamber." Obviously the writer doesn't know his asymptotes from his elbows.