



# UNDERCURRENTS

Newsletter of the Bluegrass Dive Club / [www.bluegrassdiveclub.com](http://www.bluegrassdiveclub.com)

October 2012

Volume 42, Number 10

## October's Club Meeting

**Date:** Tuesday, October 9th  
**Time:** 7:30-PM (business)  
 Social at 7  
**Location:** The Racquet Club  
 3900 Crosby Rd.  
**Program:** Roatan Trip DVD

## President's Message

*By Tracey Combs*



Hello fellow divers. Our next meeting is Tuesday, October 9<sup>th</sup> at the Racquet Club. Everyone is welcome, members as well as those who may be interested in joining the club.

Our first Mystery Trip was in September. Our idea behind the mystery trip was to take advantage of the fall specials and offer a less expensive trip to an ideal location. We plan to do another Mystery Trip next year.

Be sure to visit the website for information on upcoming 2013 and 2014 scheduled trips. As always, if you have ideas or locations that you would like to suggest, please contact the Dive Committee.

I hope everyone enjoys the Fall season and remember our next dive trip is just around the corner!! 🚩

## The Editor's Notes

*By John Geddes*



This month the pics are from Roatan taken by Doug and Noel. Next month I hope to have some of the land shots with the Friday Night trip to the West End... 🚩

*New Members, Alan and Kim*



## 2012 BGDC Officer's

Tracey Combs, President	621-4066
Corrine Mulberry, Vice President	913-0892
Kris Harn, Secretary	278-4246
Dan Miller, Treasurer	948-5133
Doug Geddes, Trip Director	224-3197
Rick Stephan, Safety Info Dir.	223-3719
Mike McCann, Webmaster	255-3937
John Geddes, Newsletter Editor	223-7926

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## Vice President's Report

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By Corrine Mulberry



The program for October's meeting will be on the recent trip to Roatan, Honduras.

If you have diving information that you would like to present at a Club meeting (past or potential dive trip, etc.), we would love to hear from you. Please contact me so that we can put on the calendar. 913-0892 or [scubagirl07@insightbb.com](mailto:scubagirl07@insightbb.com)



### **Nominations for BGDG Officers (2013):**

The Bluegrass Dive Club is accepting nominations for Elected Officers for 2013. Elected positions include:

- President
- Vice President
- Secretary
- Treasurer
- Trip Director
- Safety Information Director
- Newsletter Editor
- Webmaster

If you have suggestions for potential nominees, please contact a Nominations Committee member:

Corrine Mulberry [scubagirl07@insightbb.com](mailto:scubagirl07@insightbb.com)  
859-913-0892

Charlie Denham [charlesdenham@hotmail.com](mailto:charlesdenham@hotmail.com)  
859-254-3919

Tamara Williams [tamaraw@insightbb.com](mailto:tamaraw@insightbb.com)  
859-273-0878

Rebecca Singer [rasinger@mindspring.com](mailto:rasinger@mindspring.com)  
859-552-0880



Nominees for elected positions must be in good standing (dues paid), have been a member for at least one full year and be at least 21 years of age.

The Nominations Committee will present a slate of proposed nominees for elected Board positions at the October Board Meeting. The Board will approve a slate of nominees that will then be published in the November newsletter. Members will vote at the November Meeting (November 13<sup>th</sup>). 🚩



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## Trip Director's Report

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By Doug Geddes



ROATAN 2012

If you didn't sign up for this really cheap trip, then it is definitely too late, because we will have been there and dove by the time you get this newsletter. I just wanted to run it in a little more. We took 22 persons on this awesome dive trip. For our facebook friends, I hope they were able to see some of our photos taken daily. I know John is going to be using some of them in this newsletter. Hopefully Noel will have a program done soon for you to see.

### EAST GRAND CAYMAN 2013

If you haven't signed up and are thinking about it, you better do soon...Our reserved spots are about taken. I just hope they have space for anyone waiting to add on at the last minute. This is going to be another great trip and the diving on the East side is supposed to be one of the best. Check it out on our website and sign up soon, or get let home wishing I had signed up early.

### TRUK/YAP 2014

We finally got our contract for the Odyssey liveaboard dive boat. The price came in at \$3295.00 which includes all fees for this 8 day, 7 night trip to some of the best wreck diving in the world. WE are overbooked at the moment, but if you have an interest, you need to put your name on the waiting list. Anyone waiting to cancel now that the price is out, please do so soon. We have 5 people dying to take your spot. 🚩

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## From the Treasurer

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By Dan Miller



### 2012 Membership Dues

Student (High School or College ID) ..	\$10.00
Single & Family (1 diver) .....	30.00
Family (non divers).....	30.00
Family (2 or more divers) .....	40.00

**Renewal:** Please send payment to the address listed below, please make sure there is a correct indication of your mailing address, phone number and it is very important to indicate an email address.



**Contact / Mail to:** Bluegrass Dive Club c/o  
Dan Miller  
824 Gunpower Drive  
Lexington, KY 40509

**New Members:** Visit the website to fill out an on-line form or to access a Microsoft Word printable form. [CLICK HERE](#). 🚩

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## From The Secretary

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By Kris Harn



Board of Director's Meeting  
8-28-2012

Meeting called to order at 7:41pm. Tracey, Dan, Corrine, Kris, John, Rick, & Doug in attendance. Treasurer's report filed by Dan. Corrine went over upcoming programs from regular meetings. Rick announced trip planning article for upcoming newsletter. John asked for articles by 8/30/12. Doug went over upcoming Trips. Unfinished business either delayed for additional info or review. Motion for non-diver membership category for 30.00 passed under new business. Meeting adjourned at 9:34 pm.

Regular Meeting  
09-11-12

Meeting called to order at 7:36pm. 26 people in attendance. Tracey announced new membership category. Dan gave Treasurer's report. Corrine announced new members and nomination committee and guest Leo Kerns. Tracey asked for volunteers for trip committee. Doug gave trip updates. John announced that newsletter is out. Rick reviewed article on trip planning. Corrine drew door prizes. Meeting ended with DVD on the Bahamas'. 🚩



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## Safety Corner

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By Rick Stephan



**Note:** *Okay, with school back in session, I got into the spirit. My college physics classes taught me lessons that I never knew would be important during my vacations. Well, my dive vacations, anyway! I'm talking about the gas laws, named for scientists who discovered the relationship between pressure, temperature and volume for gases. These laws govern the science that allows us to dive – (store gas in tanks, transport the tank under water, and distribute the gas to the diver).*

*It's not important that you remember the law, the key is that you intuitively understand the effect that temperature and pressure have on the gases that you breathe (air!) as you descend and ascend. When you couple that with the physiological aspects of breathing – like the gas exchange by the alveoli in the lungs – the physics of diving quickly become important for your safety!*

*These laws were very well explained in an on-line site called the Scuba Guide.com. Again, please focus on the examples, not the equations, because that's what makes you safe. And as we all know...*



*Safe diving is fun!*

### *The Physics of Scuba Diving*

Scuba diving is all about getting air into you while you're underwater. What complicates scuba is the way air behaves at depth, under

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## Safety Corner Cont.

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pressure, in your body and in your equipment. To dive safely you need to understand all the things intuitively and how they affect the techniques and practice of scuba diving. As part of your scuba certification you will come to understand certain principles of physics, in particular the *gas laws* which apply to scuba. When you understand the gas laws all the intricacies of nitrogen management, offgassing and even rules of inflating and deflating your BCD will make more sense.

As part of scuba certification, you learned these four gas laws:

Boyle's Law pressure and volume are inversely proportional.

Charles' Law temperature and volume are directly proportional.

Henry's Law gas pressure and absorption are directly proportional.

Dalton's Law of Partial Pressures mixed gases compress equally by volume.



### *Boyle's Law*

Boyle's Law is named after Robert Boyle (1627-1691). Edme Mariotte (1620-1684), a French physicist, discovered the law independently at roughly the same time, so this law is often known as Mariotte's or Boyle Mariotte's law. During scuba diving classes the law is usually called Boyle's Law. Boyle's law relates the volume and pressure of a gas held at a constant temperature. Boyle's law is:



### **PV = k**

Where P is the pressure of gas, V is the volume of gas and k is a constant. The constant k does not need to be known to understand the relationship between P and V.

Boyle's law basically says this: When you increase the pressure the volume decreases. When you increase the volume the pressure decreases.

This Law is often applied to demonstrate what happens during ascent and descent and how it compensates the pressure in the BCD, lungs, mask and anywhere else that air is contained. As you descend, pressure increases. As pressure increases volume decreases, so the same amount of air takes up less space. Because of this, as you descend you will notice that your BCD "deflates". It is not losing air, it is compressing the same air into a smaller volume. You may also notice other effects of airspaces being compressed - wet suits fit less snugly (if you are wearing a thick neoprene suit this is even more apparent) and the airspace behind ears becomes decompressed. When equalizing you need to let more air into your Eustachian tubes to compensate for the reduction in volume.

Likewise, as you ascend, pressure decreases and volume increases. A full BCD at depth will become fuller as you ascend - that is why you must release air from your BCD as you ascend. More importantly, it is important to exhale from your lungs as you ascend. If you hold your breath while ascending the air in your lungs expands beyond capacity, which can cause painful internal injuries.

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## Safety Corner Cont.

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### Charles' Law

Charles' Law states the relationship between temperature and volume of a gas at a constant pressure.

$$T/V = k$$

Where T is the temperature of the gas, V is the volume and k is a constant.

In a nutshell, Charles' law says that cooling a gas decreases its volume. If the volume remains fixed then the pressure must decrease. A suitable example of this phenomenon is a scuba tank bursting because it is left in the trunk of a hot car in the tropical sun (temperature rises, volume is constant and pressure increases).



### Henry's Law

Henry's Law is named for William Henry, who in 1801 stated that the mass of a gas which dissolves in a volume of liquid is proportional to the pressure of the gas.

$$e^P = e^{kC}$$

Taking the natural logarithm of this equation we get the more common version:

$$P = KC$$

Where P = the partial pressure of the gas solute, C is the concentration of the gas and K = the Henry's Law constant.



To a scuba diver Henry's Law tells us that at higher pressure our bodies will absorb more gasses. At great depths, the amount of nitrogen (and other gases) absorbed into our blood and tissue is greater than the amount absorbed at shallow depths. That is why a diver going to 100' has a greater risk of decompression illness than a diver who dives only 30 feet. Since the shallow diver has absorbed less gas, it is less likely to come out of solution in the body.

### Dalton's Law of Partial Pressures

Dalton's Law is named for John Dalton, who stated the law in 1801. The law states that the pressure exerted by a mixture of gases is equal to the sum of the pressures which would be exerted by the gases individually.

$$P = p(1) + p(2) + p(3) + p(n)$$

Where P is the total pressure exerted by the sum of pressures p.



## Safety Corner Cont.

Dalton's discovery was all gases tend to compress similarly. If you have a mixture of nitrogen and oxygen and you add 100lbs of pressure both the nitrogen and oxygen will compress equally.



In other words, mixed gases will stay in the same proportions under pressure - you will not find some gasses compressing more than others. For instance, imagine squeezing a cloth bag equally full of marbles and popcorn. You know that the popcorn will compress more than the marbles and with sufficient pressure the proportion of marbles and popcorn in the bag (by volume) will change. Dalton's law assures us that among gases it will not happen.

To a scuba diver this assures us that our bodies absorb gases in the same proportions at any depth. It is this principle which makes it possible to estimate gas levels in our body, plan repetitive dives and avoid the bends.

***(Editor's note: This is important because what we breathe - air or nitrox – are a mixture of gases!)*** 🚩



## Bluegrass Dive Club 2012 Calendar

### October

9, Tuesday Dive Club Meeting  
30, Tuesday Board Meeting



### November

13, Tuesday Dive Club Meeting  
(Elections)  
27, Tuesday Board Meeting



### December

??, Saturday Club Christmas Party

