PSDiver Magazine

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Issue 121

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Greetings,

Recently there was some discussion within our Facebook PSDiver Group about civilians diving with municipal dive teams. The questions posed did not really get answered. The responses skewed to a lack of standards, misinformation about OSHA, general PSD standards, NFPA etc., etc. While frustrating to see some of the same misinformation being used and shared that we saw 30 years ago and multiple occasions since – it does reflect the state of our industry.

When I say industry, I mean the evolution of training agencies, contamination awareness, "not black" equipment and actual techniques specific to dark water diving - our genre of diving.

But that does not imply that there is actual cooperative industry network or rules or consensus within those who embody the "industry" – nothing in writing anyway. There IS a general acceptance of commonality and that commonality is what is generally referenced when PSDs talk about standards.

In Issue 112 we resolved ALL "grey areas" of OSHA and Public Safety Diving. But despite our own efforts that information is not as wide spread as we would have hoped and we still find teams who work under the concept that they are exempt from OSHA. While some are, others are not, without true and complete information, the information that is wrong and misleading is still taken as truth. That is a problem. But, it is a problem I am not sure can be fixed without the full and cooperative efforts of the "industry" leaders. It is unfortunate, but they do not play well with each other and that affects us all.

You can try but if you searched the World Wide Web for "What is a Public Safety Diver?" you will not find a singular definition. You will find what they do, what training programs are available but you will not find a simple, or a complicated definition that is endorsed and accepted by all members of the "industry". Though that dead horse we beat is still dead and as long as there exists the potential for someone to be a t-shirt PSD team diver, we are all negatively affected.

If you really want to get confused and frustrated, try looking up standards for public safety divers. You will find references to OSHA, NFPA, FEMA and a variety of opinions – but no actual consensus standards.

I started diving with my fire department team in 1979 or 1980; well over 30 years of experience and involved in the "industry" as we know it. There was little to work with then too. In fact, we didn't even know we were Public Safety Divers until somewhere around 1999. We were *just* divers on the dive team.

But today we are still without a definition, a general consensus standard or even an accepted entry requirement to become a PSD. If you just finished your open water certification and became a member of your fire department dive team it is conceivable you have less than an hour of bottom time but got the team t-shirt and are now a PSD.

Why is this so important to me? If we had a standard to follow when we asked for funding, for formal training, for time on or off duty to train, for proper equipment to do the job safer, we would have something more than a wish to submit. With a standard to adhere to, we would have a need to fulfill.

To become an EMT, a paramedic, a firefighter or police officer, you had to fulfill specific educational and skill requirements. You have to document your annual continuing education to maintain your certifications and those certifications are recognized

nationally as are the basic educational and skills foundations. If you work for a municipality and also dive, you can instantly become a public safety diver. If you are an EMT and work for or with the fire department, you cannot get a police t-shirt and be a police officer, it does not work that way. But it seems to for diving…

With a written and recognized consensus standard for public safety diving, we would have the tools we need to help properly build a team, maintain our skills and fund the training and equipment needs of the team. Without that, we are divers with unique and special skills and work within a team concept of understanding and common sense – unless bad habits and practices are handed down unknowingly.

If funding for training is never available, unless one or two team members are willing to spend their personal time and money on training and share with the team, nothing new will be learned, and nothing new will be added to improve team safety.

In December of 2006, PSDiver published an article written by Dominique Evans-Bye, the Research and Development Officer of the Ventura County Sheriff's Search and Rescue Dive Team. The article was titled: *Underwater Remotely Operated Vehicles (ROVs) for Search and Rescue Operations*. (Issue 31)

This was one of the first practical use introductions of ROV and sonar technology to PSD teams. Dominique and I were asked to attend the 2007 Underwater Intervention in New Orleans where Dominique presented her paper in a public seminar. From that point forward, we gained a number of related

Finding one person might not change the whole world, but it could change the world for one person. ***Photo from Surrey Search and Rescue***

advertiser / sponsors from that tech group and enhanced their reach to the PSD community at the time. The majority of those same companies are common names and well known with PSD teams.

But at the time, that technology was only obtainable to departments with large budgets or those with really good grant writers. It took the attack on the World Trade Center and the following Homeland Security Grants before ROV and SONAR technology become common within our diving community.

Fast forward to today and it is rare to find a team that does not have or have access to sonar or ROV options. Even sports fishermen have sonar technology we could never imagine 30 years ago. ROVs have sonar adaptions that are interchangeable and manipulator arms that can pick up objects and bring them to the surface without having to splash a diver.

We have seen such acceptance of sonar and ROV technologies that we may be taking it for granted and as such may be allowing our teams to become dependent, maybe even complacent with training. There is no argument that the use of sonar and ROVs will lessen the risk of a dive team. When possible, sonar and ROVs can replace a diver and eliminate the diving risk completely.

But what happens when that expensive ROV, the expensive ROV you convinced your department to purchase, gets stuck in an obstruction underwater?

You can't simply cut the line and hope it floats

to the top. When your supervisor comes to you and wants to know why the divers can't just go get it, what will you say?

We know what we want to say but the reality is we will likely splash a diver or two to retrieve the ROV we were using to reduce the risk of sending divers down. Ironic isn't it? How deep does your team dive? How often do you train for such dives?

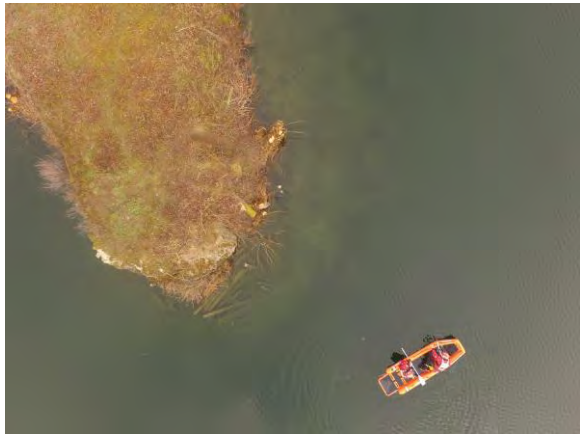
Technology can help us but we have to learn how to use it to complement our team training and capabilities, not replace us. And, now that we have touched on the subject, consider revising your operational guidelines to include recovery of an ROV and the depth limits of operations.

We often forget that there are other tools available to us. Usually they are low tech tools that we tend to forget or semi-retire because newer tech has "replaced" them. Sometimes those low tech tools have been lessened in value because we forget or perhaps never knew the extent they could be used.

Simple tools like a rope and the ability to communicate with a diver through simple tools. Or biological tools like a properly trained K9 and handler. The new tech is popular with us as a community in general because we can see the immediate benefit of reducing the time our divers are in the water. Having the ability to use sonar to "see" a target, drop a marker near it and send a ROV for video ID and / or pick up is a great capability. But it is only good when we have it and a trained and skilled operator(s) and all the time it may take to perform setup and search.

Drone use: wildfire response, missing people, haz-mat and even dive operations

Photo from Surrey Search and Rescue



Photos from Swiftwater Rescue Responders UK

Those who use dive computers to track bottom time and NDLs, how often do you refresh your skills working dive tables? Those batteries never wear out and water leaks never occur … right? What do you do when they fail on a dive site?

In this issue we will present information on K9s and their ability to scent and how they are trained and can be utilized by a dive team.

And, with a few assorted news items, we recycle and update an older article on rope signals and diver communication.

All of our resources are free including the PSDiver Magazine. When you can, share our information with team members and other teams you may come across.

Circumstances beyond my control slowed down our workshop schedule but we are taking measures to add a few instructors who can conduct the workshops when we are unable. The workshops have provided an extraordinary opportunity for existing teams to learn new skills, refresh old skills and revitalize their team members. We will begin scheduling again by June, If you are interested in participating, hosting or becoming a sponsor for our workshops, email Mark.

Dive Safe!

We ALWAYS prefer talking with you, not about you!

Mark Phillips
Editor / Publisher
PSDiver Magazine

* * *

Eustachian Tube Dysfunction and Balloon Dilation

By Mark Phillips

Since I was a child I have had allergies. Living in South East Texas, it is a normal thing. We refer to as "The Crud". We rarely see a white coverage of snow but can count on seeing our vehicles covered in a variety of green and yellow pollens throughout the year. We also have wind borne pollen and mold spores to contend with. With all of the antihistamines and various allergy remedies at my disposal, none seen to really work well, and over the years my allergy signs and symptoms have been reluctantly accepted as part of living here. I am sure this is not an unusual circumstance for a lot of you.

While I have had these issues all of my life, some of my story may differ from yours. I am not seeking commentary on stupid things I have done either… But I have a story to share.

An early mentor of mine and scuba instructor offered to teach my kids how to dive. The problem though, was he lived 4 hours away and would need a few weekends to teach and certify them. Even with him only charging me the cost of materials and lake fees, we could not afford the expense of traveling that far so many times. So when my children were still in their early teens, and before I became a scuba instructor, I taught both of them how to scuba dive. I did only pool training with them and made sure they had mastered all of the basics plus some.

When I was satisfied with their training, we visited my friend. He ran them through an entire weekend of pools sessions and open water dives and when they performed, flawlessly, he certified them. This was 20+ years ago and was instrumental in my eventually becoming a scuba instructor.

Soon after they were certified, we began what would become an annual excursion for our family of 4. During their Spring Break, my son and I would go to Cozumel for a week and my wife and daughter would go on a cruise for a week. We saved our pennies all year to afford the trips and managed to do it for years.

On our second or third trip to Cozumel my allergies were hitting me pretty hard. I had over the counter medications and while they helped, I was still feeling some effects. On the first dive of the first day, I had trouble clearing my ears. I did all the right things to attempt to clear and none of them worked well. I tried every technique I knew and eventually was able to clear my left ear but my right ear was stubborn. In frustration, I tried pinching my nose and blowing a little harder and heard a noise in my ear that sounded like chalk dragging on a chalkboard. It surprised me. It was loud and weird but even though I still felt some pressure, it had eased a bit. So I did it again.

My ear was only partially clear and when I inhaled a breath for another attempt, I guess there was a little negative pressure and I heard a different sound in my right ear. Me being me, I was intrigued, held my nose and began to blow and suck air into and out of nose pressing my mast against my face to keep it sealed. This made a new sound combination that was

the high and low pitch similar to a donkey bray – but screechy chalkboard noise. It didn't hurt but it did feel different.

When I tired of that I was able to clear my right ear enough to continue my dive. Everything was peachy until I began my assent. There was a small bit of pain but I discovered I could ease it by trying to clear my ears constantly and making my assent very slowly. I don't believe it was a reverse block, mostly because I was able to clear and the pain went away, mostly. Perhaps a partial revers block would be more accurate description.

Back on the boat, we had an hour surface interval and during that time the right side of my face, underneath the lobe of my ear, felt swollen and I felt pressure or at least fullness in my right ear. I was concerned that I would not be able to make the next dive. It turned out that I was able to dive and did so for the rest of the week. My ear, however, never lost that feeling of fullness and I finally realized that the reason I had no more issues clearing my right ear was because there was no air trapped to be equalized. It was full of fluid.

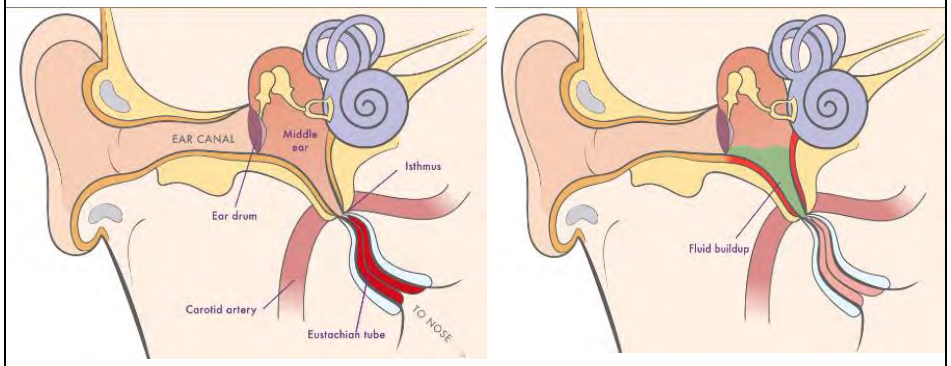
When I returned home the fullness had not left but I had to go back to work and didn't take the time to visit a doctor. After a week or so, pain set in and I was forced to see a doctor. I was treated for a bad ear infection and eventually the ear drained down and came back to "normal". But since that time, my right ear has required more attention when I dive.

But wait – There's more…

When I was young, I learned how to shoot a 22 caliber rifle. Target practice became a sport for me. When we were old enough my best friend and I would travel to gun shows and buy beat up Colt 1911s. We would rebuild them and sell them at the next gun show. We occasionally bought other guns to work on and resell, and weather and circumstances permitting, we would go shooting at least once or twice a month. Our favorites were large caliber pistols, 44 Mag, 45 Auto and 41 Mag There were powerful and very loud. Back then, ear and eye protection were not something we ever considered. As a consequence, I am told, I have total hearing loss in one particular frequency. They tell me it is common among shooting enthusiasts. I rarely notice it though.

WHAT IS ETD?

Eustachian tube dysfunction (ETD) is the failure of the Eustachian tube (a passage that leads to your middle ear) to open and/or close properly. The Eustachian tube may be narrowed or clogged.



Common signs and symptoms associated with persistent ETD include:

- **Chronic pressure in the ears**
- **Pain in the ears**
- **A clogged or "underwater" feeling**
- **Loud hearing of your own voice (autophony)**
- **Crackling or popping sounds in the ears**
- **Ringing in the ears**
- **Muffled hearing**

During the past month, if you had them and any of these symptoms were either a "moderate problem" or a "severe problem," it may be time to talk to your doctor.

In that same time period I also worked part time as concert security and was able to attend a vast number of Rock and R&B concerts. We always seemed to remember wanting earplugs about half way through but never when we were actually in a store where we could buy them. I also ran security for two popular night clubs at the time. Back then we thought we were invincible. But the exposure to the excessive noise eventually caused tinnitus (ringing) and I have it in both ears.

So combine that with the diving incident, allergies and my aging body, and I have a problem. My reaction to allergies is much more profound, my ears are harder to clear when I have allergies and sometimes the ringing in my ears is so loud I swear people around me can hear it too. And at the worst, I experience all the above plus flu like symptoms.

This year I was determined to do something about it. I scheduled an appointment and visited my long time Ear, Nose and Throat Doctor. He ordered a hearing test, did an examination – all the usual, and based on my history, determined I had Eustachian Tube Dysfunction (ETD). The conversation with my doctor that followed *was new*.

First, he wanted me to have an allergy test done. I had had one a few years back but instead of injecting me, they used blood samples to test with. This time, he wanted the full deal. But, and this turned out to be a BIG deal, I take a beta blocker daily.

Originally prescribed to mitigate migraine headaches in the 1980s, I still take it as a blood pressure medicine. Beta Blockers negate the effects of epinephrine and epinephrine is what they use to counter severe allergic reactions and anaphylactic shock. So,

ACCLARENT AERA® VS. Ear Tubes

ACCLARENT AERA® is a procedure that gently but firmly puts pressure on swollen tissues to create an opening.

- **Balloon is placed through the nose**
- **Natural anatomy is preserved**
- **No cutting required**
- **Safe and minimally invasive**
- **A nonsurgical approach to treat persistent ETD**
- **Designed specifically to treat the Eustachian tubes**

Ear tubes are just that: tiny cylinders inserted through the ear drum in a hospital setting that permit air to enter the middle ear. They also may be called tympanostomy tubes, myringotomy tubes, ventilation tubes, or PE (pressure equalization) tubes.

- **The ear drum is cut or perforated**
- **Tubes are supposed to fall out after a year or two. If needed, the procedure is repeated**
- **Tubes may need to be replaced several times[1]**

Proven effective and safe for ETD patients

ACCLARENT AERA® was studied in the only prospective, multicenter, randomized clinical trial of balloon dilation procedures. The clinical trial results were[1]:

99.7% — **Technical success** was high in accessing and dilating Eustachian tubes.

51.8% vs 13.9% — **Higher rate of tympanogram normalization** in investigational subjects vs control subjects treated with medical management alone.

56.1% vs 8.5% — **Improvement in the quality of life** as measured by Eustachian Tube Dysfunction Questionnaire (ETDQ-7) with more investigational subjects reporting a mean item score < 2.1 vs control subjects.

0% — **Serious device- or procedure-related adverse events.**

according to their testing facility protocols, I needed to be off the beta blocker for two weeks before taking the allergy test. So two weeks prior to my appointment, I stopped taking the beta blocker That was the right thing to do but the wrong way to do it. Stopping a beta blocker cold turkey is NOT a good idea. Aside from a weird personality shift, I experienced anxiety, angina, and elevated blood pressure and once thought I was having another atrial fibrillation episode.

But I did the allergy test. It turns out I am allergic to a variety of pollens and mold spores. This was not new news. It was however, a base to work from.

The proposed solution was two-fold. First I was to begin a weekly series of allergy shots to build immunity to the things I was allergic to and the second step was a relatively new procedure to dilate my Eustachian tubes. But to do the first I had to continue to stay off the beta blocker. That was a deal breaker especially when I finally put two and two together and looked up the consequences of abruptly stopping a beta blocker.

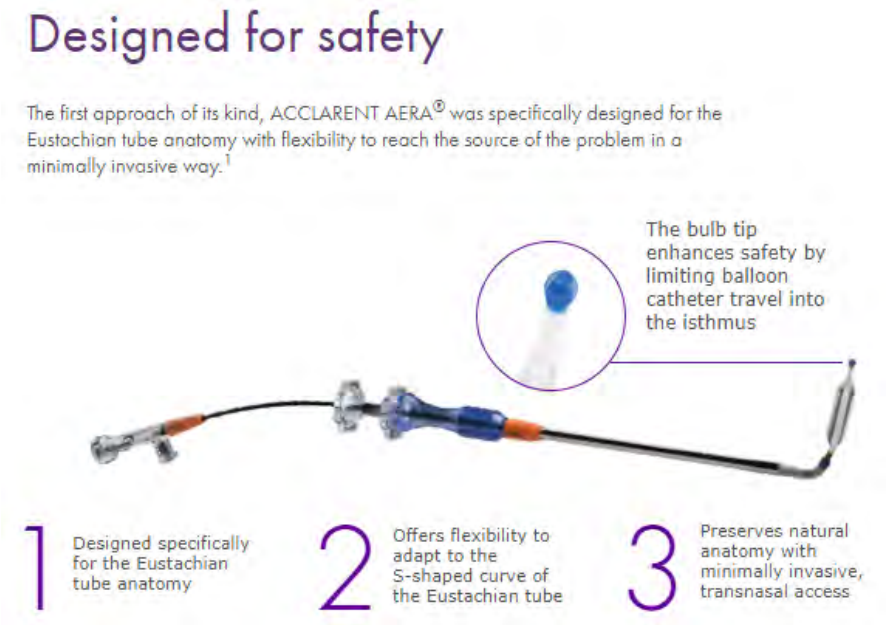
That information would have been nice to have known before, not after I stopped cold turkey. I was not willing to go through all of that

again and substituting something else required weaning off the beta blocker, finding an alternative drug, multiple and various doctor appointments…. So we put step one on hold and went to step two.

I have given you this background in order to tell you about this procedure because it has helped me. My ear related symptoms included: occasional dizziness that sometimes became extreme, loss of equilibrium and nausea, tinnitus, sinus drip, fluid in my left eustachian tube that caused some pressure and a nagging clicking noise, pressure in my right ear and pressure in my sinus cavities.

Because of my symptoms, there were two procedures the Doctor wanted me to undergo. One was a Balloon Sinuplasty and the other a Eustachian Tube Dilation. Both are minimally invasive and were able to be conducted in the doctor's office and neither required any anesthesia other than local pain deadening.

After filling out forms, prepayment and taking vital signs, they shot sinus spray up my nose to flush my sinus cavity followed by a



numbing spray that deadened the area. They packed my nose and had me take a mild pain pill and another pill to help me relax.
While we waited an hour for all the meds to take effect we went over the post op rules. They included no strenuous activity for a week, no lifting anything over 20 pounds and no blowing my nose.

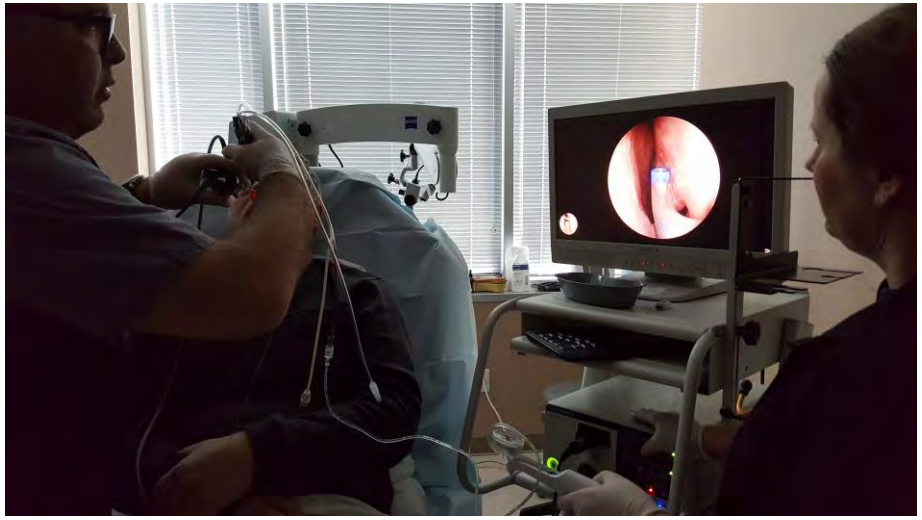
With the packing in my nose, I could only breathe through my mouth.

Swallowing was hard and the nasal drip was frustrating. When the numbing spray hit the back of my throat and I could feel it working. The sensation was not painful but the unusual sensation was somewhat uncomfortable. There was numbness and pressure behind my top front teeth and swallowing became impossible as the hour progressed.

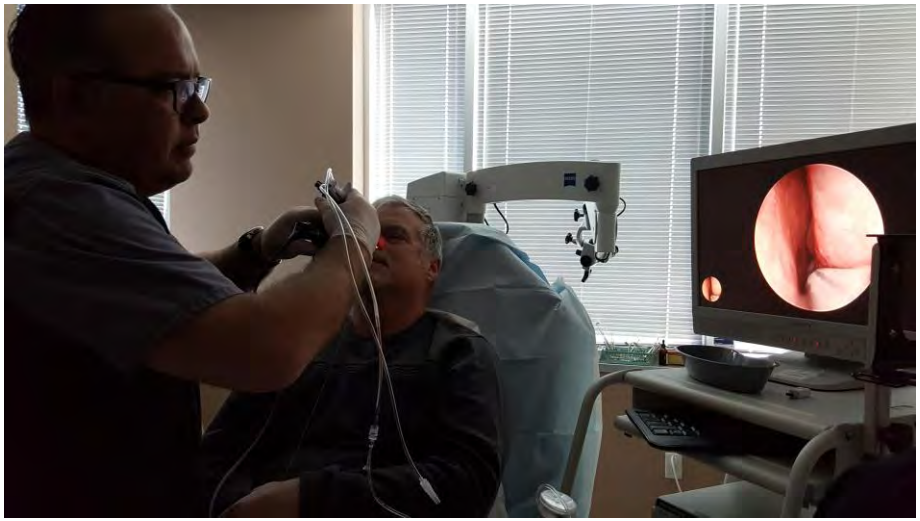
Then we started. They hooked me up to a machine, put tubes in my nose and went to work. The Balloon Sinuplasty was anti-climactic. I never felt it and I had no idea it had been done.

The Eustachian tube procedure was a different story. I had been warned there would be a pinching feeling coming from the eustachian tube. It was more like a sudden pain that reminded me

more of the quick puncture of a hypodermic needle. That was followed by pressure inside my ear / lower jaw area when the balloon in my eustachian tube was inflated. This concluded with a dragging sensation as the balloon was deflated and removed from my eustachian tube; some minor pain and done.



Then they moved to the other side and repeated the process.



The whole procedure took less than 15 minutes. When they were through, my sinuses were numb, my top teeth and the back of my throat were both numb. Then I started to have drainage but still couldn't swallow so I my best to ignore it. After a few minutes I was given a cup of water, couldn't swallow and choked.

While all of this is happening, the doctor is having a conversation with me that is helping to distract me from the discomfort and reassures me that the numbness is wearing off. It was.

After another 15 minutes or so I am able to drink. Still can't clear my throat but the numbness is wearing off. After another 20 minutes or so, I am almost back to normal and I am sent home with medications, instructions and a follow-up appointment scheduled in a week.

Once home, my nose was running and I kept wiping it with the box of Kleenex I kept by my side. Wipe the runs - not clear, light brown color – medicine residue I suppose. An occasional spot of blood but not continuous and that stops after another hour or so.

The daily regimen that follows is a sinus rinse with an antibiotic dissolved in it. I do this once a day for a week. I also take a daily

sinus tablet and at least one antihistamine as well. When the antibiotic runs out I continue the rest on a daily basis.

Early into recovery, I was feeling a lot better. But one particular day I was cleaning out my truck and not thinking, blew my nose. In that instant I learned why I was told not to do that. It hurt and because my eustachian tubes had been dilated, I actually felt my left one fill with whatever it is they fill with. Fortunately, it cleared after a day and I had not caused any damage.

One week after the procedure I have my first follow-up appointment. They numb my sinuses again, suction some goo out, look around and tell me to keep doing what I am doing. By this time I feel like I breathe a little easier. The ringing in my ears is still there but the crackling noises I had heard in my left ear are gone.

At three weeks I had another follow-up appointment. They numbed my sinuses, sucked out a small bit of goo, looked around inside and tell me I am doing well.

There had been a few days of heavy pollen and on those days the noise came back in my left ear and the post nasal drip and a little dizziness occurred once or twice. Knowing the cause and having a moderate if short term, solution helped: sinus rinse, decongestant and antihistamine meds. My next follow-up is in 3 months. I have no reason to believe I will experience anything contrary to what I have already.

6 weeks have passed. I no longer have the clicking noise in my left ear. I am still doing the sinus rinse and pills and I can feel the difference. I am still affected by the pollens but where I would experience debilitating flu like symptoms, now it is a minor inconvenience. More importantly to me, I can easily clear both ears at will and no longer have a feeling of feeling of pressure in my inner ear. The ringing is still there though it may be diminished slightly. But I was told to expect it to take as much as 6 months for the full effect of the procedure. So I continue my daily regimen and carry on.

10 weeks have now passed. For the last 2 weeks, pollen has been heavy and allergies have stayed triggered. The ringing in my ears seems to intensify with the severity of the allergy reaction and I see no difference between pre and post op. However, using a saline based sinus wash every evening and adding Singulair (Montelukast Sodium) to the few meds I take at night have helped reduce the severity of the reactions. I also take an antihistamine at least once a day – usually in the mornings. There is a difference between the two medications. I still don't claim to understand it all but apparently the medications do different things and working with each other, manage to reduce my allergy reactions.

> **Montelukast sodium**, the active ingredient in SINGULAIR, is a selective and orally active leukotriene receptor antagonist that inhibits the cysteinyl leukotriene $CysLT_1$ receptor.
>
> **Antihistamines** are substances that block histamine activity in the body. Histamine is a protein that triggers allergy symptoms, such as sneezing, itchy eyes, and a scratchy throat.

At this point, I am managing my allergies a lot better and they do not take as large a toll on me as they have in the past. I am able to clear both ears easily and at will. I am a bit disappointed that the tinnitus has not had a noticeable change but I wasn't really expecting it too.

My circumstances may differ from yours and my solution may not work for you. But if you have similar issues to what I have described, the procedures I had have helped me and may help you too. See a doctor and establish a plan of treatment. Do not try self-treating with over the counter or old prescriptions especially if you are planning to dive soon after.

I hope my shared experience will help. If you have questions, email me or private message me through Facebook.

Mark Phillips Mark@PSDiver.com

https://www.facebook.com/profile.php?id=732527017

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The Public Safety Diving Discipline -Part 3

By Mark Machaud

In my last article I wrote about obtaining additional training from those who have the experience and making the best use of available resources. In this article I want to cover the actual search.

Here are my thoughts concerning this: The third hole I see is how we determine (and implement) our search parameters and resources. We go to a missing person or drowning call and we seem to overlook what the known factors are and we don't work with them. We pay more attention to things like currents and wind. We leave out basic human behavior on the part of the victim and leave out resources that are readily available.

Many times we inadvertently use the "Shotgun" method. We dive a little, walk a little, we run a bit of sonar, and so on and so on, hoping something "hits". Sometimes the lead agency wants you somewhere and sometimes the family wants you somewhere else. But **we** have to be thorough in every step just as we would affect a search warrant on a house or business.

First, and foremost, what do we know for sure? Is there clothing, a boat on land (or anchored), a spot where the event started such as pilings or a dock? Are there 911 calls that can be pinged for an azimuth (direction) and distance from the provider's tower? Is there a known person missing, a vehicle located nearby, a boat sunk or floating? By the time the media arrives, someone has usually notified the authorities that a person is missing.

We have outside options that can make our searches much more efficient. Cadaver K9's (land and water), sonar and experienced operators, and drone operators can make a good addition to most operations.

K9's should be called immediately. That is the best resource out there. A K9 can let us know there is a cadaver in the water. A K9 can also help isolate the search area. When a K9 alerts, you know someone is in there. How much time do we spend searching because someone thought they saw someone go into the water and not surface?

Another thing happens when K9 is brought in. The K9 and the handler gain more experience and the team gains experience with the K9 and handler.

Something to consider:
On searches where K9 teams are brought in, I have made it a practice to have all of the K9's and handlers work the area after a victim has been located either by K9 or other means. Each handler takes the K9 into the area and works as if the victim has not been located yet. (So far, I have not had any agencies refuse the request to do that.) For the few minutes it takes to do that it is a win / win for everyone involved. K9s should be sure trained on real cadaver tissues and decomposition. If they cannot obtain cadaver material, there are other means to obtain what you need train. Blood, drained body fluids, even used tampons can be stored and used for training. All of these things decompose just like flesh. If you find a decomposing floater, soak up the water (around the body) and store the "sponges" rags and such as you would evidence. Then store it in a freezer that is used for just that. This is what handlers need to properly train their K9's so they don't alert on roadkill.

Human decomposition has its own smell and the K9's need to train on that.

Your available technology must be used in training and team members must be given opportunity to learn how to use it and how to interpret the data collected.

Sonar (side-scan and scanning sonar) are wonderful tools, but, they are not cameras. They are tools and are subject to interpretation. Without a lot of "trigger time" you can't get good at it. How do you get good at it? You use it as much as you can. You insert it into your dive training and you go places where you know what is on bottom and identify things.

We are always trying to juggling work, family and home life.

When we add the PSD extra duty and responsibilities into our already crowded lives, we can sometimes over tax ourselves.

Sometimes administrative support is of little to no help. We may receive no funding for training, limited or no time allotments for on duty training – it all complicates our abilities. The only way we are going to progress is to take the initiative ourselves.

We have to have, and meet our own expectations and avoid settling for mediocrity. We need to find resources we can call and depend on when they are needed and we must continue to learn and expand our knowledge and resource base.

You have to work in the guidelines and SOP's of your agency. But having a ton of extra tools (in your tool box) never hurts. I am not talking about being unsafe or violating SOP's, SOG's or anything like that. But sometimes we try to be so safe that we lack efficiency. We have to know about things like Delta P, real hazmat (and when to avoid that) and when too much current negates diving as an option. Maybe others can come in and assist, maybe the operation can never be done. Our water response teams are expected to get the job done, no matter the situation or lack of equipment or training.

We have to know when to say no and make reasonable judgement calls based on the onsite personnel, their training and equipment available. And we have to have the courage to say no and refuse an assignment when we do not have properly trained personnel or proper equipment available. We also need to establish when and where we can ask for help from outside resources.

I recently read where PSD teams ended a search for a victim in less than 20′ of water in a known last seen area, because of too much grass or obstructions on the bottom. Rather than call for help from someone outside their organization, they just gave up and waited for the body to float. Sometime that does not occur until weeks or months later.

In the meantime the family does contact outside resources and puts them in the middle between the family and local authorities. If the find is made by the outsiders the question is asked: "Why didn't the home agency do the job"?

Quitting without exploring options is not acceptable. If we are working in our own territory and are unable to conduct a search or are unable to make conclusive decisions based on conditions, we need to call for outside help. We should know our limitations and how to access outside resources. This is our back yard and we are always responsible for our area. If we can't get the job done ourselves, we should be the ones to call for the outside experts and not just quit and leave it to the family to search for outside help.

Several things have to happen. We need to get better at what we do. There is always a time that we don't get the "warm and fuzzies" and a diver may need to pass on making a dive. A TEAM however, should be capable. When the team is unable, unprepared, underequipped or lacking adequate training then the team should be capable of accessing outside resources.

Sometimes, we need to begin calling outside resources in sooner than later so they can *complement* our search and make the best use of our resources. We can't always have everything we need in house, but if resources (sonar, rov, K9s) are available they are usually just a phone call away.

We need to obtain and train with our own electronics. Some of this equipment is within a reasonable team budget. I have been using

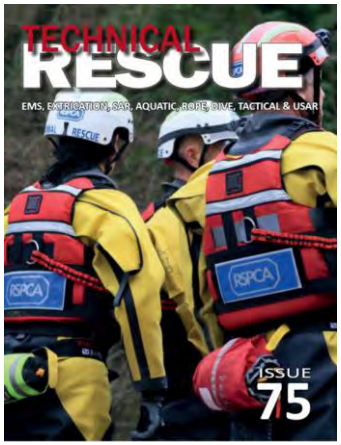
Humminbird side scan and 360 sonar for a while now. It is amazing how good these products are in SAR use. They are inexpensive, portable, and you will use them.

> *Tom Crossman and I were coming off the water in a Kentucky lake when we saw the red and blue lights on the shore. We went over and found a young man had drowned. We offered our assistance and it was accepted. We moved to the, last seen, area and I dropped my Humminbird 360 overboard as Tom was preparing his Video ray ROV with Blueview scanning sonar. I viewed a target some distance to our left. I notified Tom who was dropping his ROV into the lake. He positioned it in that direction and saw what I did. A few minutes later Tom was doing a video inspection and recovery of this young man. This man was on the surface less than an hour after being reported missing. Had Tom not been there a diver would have gone to that target and done the recovery but Tom was able to do it with his ROV.*

In the right hands, expensive equipment is worth the expense. In the wrong hands it is virtually useless. It is not the cost of the equipment that counts; it is the ability to use it effectively. It takes commitment from all involved and a lot of time working with the equipment to be truly efficient and effective.

In the world, we live in, how can we work a shift (police or fire) and have time to get good on sonar, dark water (diving) skills, or working in obstructed areas? Our resources are limited. If they are not (limited) then YOU, not your department, have an obligation to make yourself proficient. This is not recreational diving. It is like being a fireman or a tactical team. They go places that are not the norm and not safe. They train and learn to mitigate the risks. We have an obligation to do the same.

Victim's loved ones depend on us. Our loved ones do too. We need to bring lost people home and we need to go home every time too. A family will encounter a drowning once in their lives, as a rule. We will deal with drownings many times in our career and some, multiple times a year.



Technical Rescue Magazine
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We must take a hard look at what we do and fill in the gaps that have developed over the years. Those gaps include mastery of basic scuba skills, the ability to run an effective search pattern in zero visibility, proper weighting, better equipment configurations, panic resistance and more. What we do is hard and the ability to overcome obstacles because of individual and team skills could make the difference in one of our divers making it home or becoming a victim themselves. The gaps can also include a lack of available resources to call for extra help when needed. The time to discover these resources is not while your team is already in the water. Take time to call nearby departments. Find out what they can offer you and your team them. Consider a joint team training event or two or three during the year.

Where can you find an ROV or a Sector Sonar or towed sonar system if necessary? Is there a K9 team in your area or within a day's drive that is trained to find cadavers?

Sometimes bringing help in early, such as K9's and a good sonar, or ROV, operator can make us get wins. We need wins.

When we just wait for a victim to float, we have resolved that we cannot do the job necessary. While there are circumstances that just cannot be helped, waiting for float

is not what we signed up for.

We have come far over the years but we still have a long way to go. We still have no PSD consensus standards. We now know we are considered commercial divers by OSHA and who and why we as PSDs either are or are not covered by OSHA. Social media has provided us access to other teams and training concepts and the ability to ask questions of those who do the same work. We have opportunities that most never know about.

Until something comes along that unifies and defines Public Safety Diving as a genre of diving we can function under the same department, agency of institutional guidelines we have been using. Strive for excellence, never for mediocrity. Take personal responsibility and work to be a better diver and team member. Make the effort to find resources and help if and when you need it. We are the DOERS not the watchers.

Be better today than you were yesterday and better tomorrow than you are today. You make the difference.

Mark Michaud
Slidell PD *Retired*
Southeast Louisiana Underwater Search and Recovery
https://www.facebook.com/Southeast-Louisiana-Underwater-Search-and-Recovery-1438568169746982

Forensic Scent Evidence
By Harry Oaks

Forensic **S**cent **E**vidence is the determining through scent discriminating search dog teams, one dog, and one dog handler, that a specific scent is present at a specific location. Example: A persons remains can be positively identified through scent at a specific location, and hold the search dog handler's documentation and testimony credible in the courtroom.

Photo. Ranger watching as Harry recovers human remains of Dela Carlson. Ranger located remains in Coyote Poop in Clatsop County, Ore. Verified by the State Medical Examiner's office of Oregon.

Each individual here on this planet owns his or her own DNA specific to his or her person. All living matter that uses oxygen to survive has been determined to being DNA specific. This also means that each life matter holds its own scent as well. This includes vegetation, trees, flowers, insects and animals.

SCENT.

What is scent? Scent is made up of many things. Rafts, dead skin cells that a living being loses at a rate of approximately 10,000 per minute. Oils, body fluids, produced in our bodies and absorbed in our hair fibers are just some of the basic components of scent.

There are three types of scent. Live, stress, and death.

- **Live scent**. As you are living and breathing you give off your own specific scent. This is called **live scent**. A trained search dog can detect and follow this scent source

from Point A to Point B up to a year after it has been given off in the search site outdoors.

The search dog is an emotional being and will respond as such. It's a proven fact that dogs hold the same exact emotions and feelings as we humans do. Anger, guilt, jealousy, envy, happiness, sadness, fear, and love. When the search dog smells a living human, they are happy. Humans mean love, food, and comfort. The dog's tail is observed in the up position and wagging. The dog's ears are up, and the dog may be barking out of happiness and certainly will show a huge smile on their face.

- **Stress scent.** When a person is attacked or in fear of something, they will generate a chemical called **epinephrine**. This is a strong drug that helps us cope with stress, anger, etc. The person's heart rate and respiratory rate increases, their reaction is called a "**Fight or Flight response"**. The search dog smells this as a **Fear scent**. The dog is observed reacting in a **cautionary posture method**. Tail halfway down, ears usually are up, the dog's tail is held still and the dog may whine or bark to show that they are guarded.

- **Death scent.** Immediately after you die, you start decomposing. You are now giving off your Death Scent. Anyone who comes in contact with your death scent can transfer your death scent onto themselves and anything they touch. One their clothes, boots, gloves, equipment used to transport your remains.

This is how I can identify murder suspects to the police. See my book, **Scent Evidence,** for more information on how this is done. Your death scent will stain the surfaces you come in contact with.

When a search dog smells death scent, they are observed to becoming immediately emotionally upset. Their ears are down, you can see sadness in their eyes, and their tails are down and may be tucked between their legs. The search dog will usually whine and bark. They may immediately defecate and urinate to release their stress. They often will find grass to eat to settle the acids in their stomachs from them becoming upset. Some may become so upset they vomit.

TIME. How long does scent last? Search dogs have located scent and its source, hundreds of years old. Buried remains determined to be hundreds of years old have been located with the use of search dog teams.

Many of us have heard some search dog trainers making statements such as, "A search dog can't track a specific scent after 24 hours in contaminated areas". This is a completely false statement made by extremely uneducated persons.

Hundreds of search dog teams around the world have documented their success in tracking a specific scent from its origin to its source, weeks, months and even up to a year after it was performed. It's all about the training and trust of the dog handler and his or her dog and the handlers understanding of scent.

Any person making an uneducated statement that scent can't be tracked after 30 days is a person who hasn't taken the time to have a scent trailed laid down on a specific route and tested his or her tracking dog on the scent trial. All it takes is for these folks to have a "Victim" or "suspect" walk from Point A to Point B. Have a witness document the route taken.

The starting point and stopping point. Then have the dog handler come in 30 days, 90 days or 6 months later and work the

track. We do this on a regular basis to prove to our students it can be done.

WHAT EFFECTS SCENT?

There are many factors that affect scent.

- **Rain** rarely affects scent. It actually helps the search dog in detecting scent. It keeps the scent moist and it livens the search dogs scent receptor cells. Rain can carry scent downhill to a creek, to a river, to an ocean. It travels within and on top of the water. It can be carried for hundreds of miles.

- **Heat** is a harsh factor as it dries out the search dog's scent receptor cells and the scent itself can be baked. This makes the scent more susceptible to flaking and the weather elements. With heat are weather conditions called THERMOS. This is a rise of a mass of air molecules from a lower point to a higher point. When it's extremely hot, the scent will rise with the air mass through thermos and evaporation.

- **Cold**. Extreme cold minus 32 degrees F. can freeze scent. Once thawed, the search dogs have no trouble determining specific scents. While frozen, scent is contained within a specific area and the dog team must be right over the containment area before the dog can detect it.

- (Example- Avalanche or cold water drowning victims). When the temp. Is extremely cold it will contain or lower the scent from its origin. Thus scent becomes heavy and stays down low to its origin. I've located a missing climber on the North Face of Mt Hood on Elliot Glacier with my search dog Ranger when the air surface temperature was –40 degrees below zero. We located the climber alive in a crevasse in less than 30 minutes.

- **Wind** can blow the scent all over the place and thus confuse the dog handler. The dog has been able to pick up a scent and follow scent to its source up to forty miles away. Meaning if you place one single drop of scent on a 2-story windowsill. The wind can blow a detectible scent to a search dog down wind.

CONTAMINATION

Cigarette Smoke:

Smokers are warned. When a person knowingly and willingly absorbs toxins into their system through the burning smoke of nicotine, (Cigars, pipes, and cigarettes) the nicotine gives off several known cancer causing poisons, which you are putting into your body and everyone else's around you who happens to breathe in the smoke. Nicotine is a poison.

So not only are you polluting and contaminating your scent, but when the poison hits the air as secondhand smoke, everything and everyone who comes in contact with this poison is affected. Now knowingly and willfully putting this poison into your body is what many people call stupid. Anyway, plants, animals, pets, children, all succumb to one person's drug addiction and poison. (That's where the stupidity comes in).

Yes you do have the right to smoke and kill yourself. But you don't have the right to force others to slowly be poisoned by your drug addiction. Parents never smoke in the same living space, vehicle, or breathing space of your two and four legged (pets) kids. That's child and animal abuse.

Anyway, cigarette poisoning absorbs the scent and the user now gives off their own specific scent. The scent is now masked by nicotine. Which is a numbing agent like cocaine, lidocaine, etc. This can actually numb up the search dog's nose and throw the search dogs scent receptor cells off, on top of the contamination of the scent already present from the wind, rain, heat, cold, other scents in the area. This has at times in some searches, made the search dogs nose almost useless.

Can we track people who smoke? Yes of course, but the search dog must overcome more challenges then tracking a non-smoker. Exposure to Nicotine has often hurt the ability of dog handlers and their search dogs to bring success to a specific mission.

Does camp fire smoke hurt the search dog abilities? No, it doesn't contain the poison Nicotine in it.

One time we were searching for a missing 21 year old in Sacramento, Ca. My search dog kept alerting along a specific route but I failed to find any clues (Footprints etc.) that would support my search dog's track. When I talked with the family, I later found that their missing son drove this route every day for a year.

And to make the search more difficult, all of the family's volunteer searchers (friends and family members) had been in the missing person's room repeatedly during their ongoing search. Also, for an emotional attachment, some of the searchers had worn some of the missing persons clothing during their search. This gave my search dog a false scent trail. So, if your search dog tracks a specific direction, look for supporting clues and ask questions.
Why is my dog tracking, trailing this direction?

Scent Discrimination.
How is a search dog trained to tell the differences between scents?

This training is called scent discrimination training. After the search dog is trained for agility, obedience and basics in air scenting, tracking, trailing, live and cadaver work, the dog is then trained in SD. (scent discrimination).

We take ten paper sacks containing 10 different collections of human hair: One person's collection of hair in each paper sack. We place the bags apart at 6-foot intervals. This is like a suspect line up search.

We number the bags from # 1 to # 10. We then take a sample of hair from one of the bags.

Example: (DH) Dog handler takes a sample of human hair from bag#6. Introduces this scent to his / her search dog and gives the bag (Victim) a name. Search dog Valorie this is Rick. Then the DH gives his / her (SD) Search dog the work command. "Go Find Rick".

The DH takes his / her SD along the bags (victims) and has his / her dog examine each bag. When the dog comes to the bag from which the DH took the hair sample from, the DH shows the SH the hair and again reinforces the scent. When the dog alerts that he / she has found the scent coming from a specific bag, in this case bag# 6, the DH has his / her search dog sit next to the bag and bark. To indicate to the DH that the search dog has identified the victim (bag) and made a find.

Then the DH gives his / her search dog a huge reward of love, hugs, and kisses. When the search dog can perform this task 10 out of 10 times correctly, they (the dog handler and search dog team) have passed their test of scent discrimination and is now certified as such. They are retested twice a year. Each time the trainer, tester, DH tests the search dog, they change the victim (bag) and the hair so the search dog isn't going to the same bag each time. The search dog must show the DH correctly which sample came from which bag.

Understanding Scent.
When a person or animal travels from point A to point B, they drop approximately 10,000 pieces of scent per minute. This again is detectible years later depending on the elements, wind, rain, heat, and contamination.

When I testify in court cases, I put a color to scent so that the jurors, layperson, attorneys and judges can see it so to speak. I

explain it this way. "Let's say you yourself are dropping scent and it looks like yellow chalk. You are now dropping 10,000 pieces of yellow chalk (scent) per minute from point A to point B.

The scent is eventually carried all over the route by wind, rain, heat, and contamination. People, animals, traveling over the top of it with their scents and transporting their scents and the specific scent (Yellow chalk) in their own specific direction.

A search dog can detect one-one trillionth of a scent particle. A particle so minute you cannot even see it. So even though you are dropping 10,000 pieces per minute, the dog only needs a mere particle of what is left after the rain, heat, wind, cold, contamination gets through with it, for the search dog to follow the trail.

As it is trained to do, a search dog can track (visualize yellow chalk) scent from point A to point B. Here is what confuses many search dog handlers from their completion of a mission.

Subject A goes for a walk in the forest. From the trailhead where he parked his car, (point 1). Subject A walks two miles down the forest trail to Fish lake. (Point 2). Subject A accidentally slips into the water and drowns.

The ideal search would be that a family member reports Subject A is missing to their law enforcement agency. The law enforcement officer responds to the parking lot, (point A) and finds the victim's (Subject A)'s car. The law enforcement official doesn't get near the car and activates a trained, tested K-9 search and rescue team. Thus there's no contamination of the area.

The official calls in a search dog scent discriminating tracking team and tracks Subject A from point 1 to his final resting place point 2. This of course is pure fantasy because here's what really happens. Subject A has left his scent trail. The family usually finds out that subject A is overdue then they drive to the **P.L.S.** (Point Last Seen) and find his car. The family goes inside of the missing persons vehicle with their spare key, look around for evidence and walk all over the scene, thus contaminating their scent on top of Subject A's scent. Then they walk around and look for subject A. Now we have Sub. A's scent, but we also have to deal with Subject B, C, and D.

Then after a few hours, or days of searching and failing to find Subject A. Sub. B calls 9-1-1 and gets a law enforcement official to respond. The officer, we will call him Subject E, gets inside the vehicle searching for clues, evidence, and the victim Subect. A. Subject E can't find Sub. A, so he calls in his search and rescue teams. 20 volunteer searcher teams come in to the area, and search for two days and can't find Subect A and give up their search efforts.

Now the area is so contaminated, I call it a horrific act against the original scent trail. It's now diluted with 20 other individual scents and false trails. The subjects A scent being carried on the bottom or top of subjects B, C, D, E, F, G, H, I, J, K, L, M, N, O etc feet all over the search area. Instead of seeing just the yellow chalk, now you are visualizing every spectrum of color and mixtures there are in the rainbow.

Combine this with the winds, rain, heat, and animals, instead of one scent now there are hundreds of scents for the search dog to filter through.

Human Remains.

When a person dies, they immediately start decomposing. This is nature's way of returning to the earth what originates from the earth. You quite bluntly are a source of minerals, and protein to insects, bacteria, and all meat-eating predators. Beetles, flies, worms, other humans, wolves, coyotes, raccoons, rats, possums, hawks, eagles, owls, bears, cougars, cats, dogs, and every other

animal that eats meat may knowingly or unknowingly consume parts of you.

As decomp body fluids leave the body, they are absorbed into the ground. The ground acts like a sponge and can hold scent for hundreds of years. Even after death you still will own your own specific scent. Rainwater can filter through your remains and drag your scent downhill.

In the hundreds of recovery operations I've been involved in over the years, the last remains that belong to you decompose slowly; teeth, hair and bones.

Predators And Processed Scent Evidence.
On land, all meat-eating animals, birds, and insects will consume parts of you when you die in exposes in the elements. In salt water, all fish, lobsters, crabs, sharks, alligators, and crocodiles. In fresh water sources all fish, crayfish, rats, and other meat-eating critters may help in consuming parts of your remains.

Now here for the searcher is where it becomes interesting. As we eat, we eventually digest what we eat and discard it as urine and feces. So do all other living creatures. When they consume parts of you after you've died, they discard your now processed body parts in their feces, your scent hasn't changed.

So when the animal defecates your eaten remains, your remains in the defecation still smell just of you and will hold your scent. Thus we've found hundreds of victims processed in coyote and other animal feces on the trail.

This is why we are successful often when other teams have failed.

Many search teams look for the whole victim. We never do. We look for the processed remains of the victim. Should we find the person alive, which has happened on occasion, then all is well. More often than not, we find what's left of the victim in animal feces.

Nature taking care of Nature.

This at least brings closure to the family. By watching our search dog's reaction to what they are smelling on the trail, in fecal matter discarded by the local wildlife we can tell what has happened to the victim. We can also determine their approximate position from the fecal matter located by what breed of animal deposited it.

Our search dog findings of human or missing pet remains in animal feces has been confirmed hundreds of times. Hair, clothing, fingernails, bone fragments, and specific muscle, fat, and other body parts have been located in fecal matter of predatory animals by our search dog teams.

Presumptive death certificates and search warrants have been written on behalf of the missing person based on our search dog team's findings. This helps the detectives and or the families put closure to their cases.

Author: Mr. Harry E. Oakes Jr. International K-9 Instructor, expert on scent, scent evidence, search dogs, search dog handlers, and presenting evidence in the courtroom.

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Kenmore Air Contributes To West Coast Disaster Drill

http://www.bothell-reporter.com/news/kenmore-air-contributes-to-west-coast-disaster-drill/

April 30, 2019 by Kailan Manandic

The drill is part of an ongoing effort among volunteer pilots to prepare for "The Big One."

Kenmore residents looked to the sky the morning of April 27 to see seaplanes hauling supplies up from Renton in a coordinated effort among volunteer pilots preparing for the biggest natural disaster looming in the Pacific Northwest: "The Big One."

The Cascadia Subduction Zone Fault threatens a potentially catastrophic earthquake with an 8.5 magnitude. Hundreds of volunteer pilots took to the sky last week in an effort to refine their response to such a disaster.

Organizations throughout the west coast, including Kenmore Air, Washington Seaplane Pilots Association and the Washington Pilots Association, have worked together to form the Disaster Airlift Response Team (DART). DART is a volunteer team of pilots, separate from government emergency response, that aims to assist relief efforts when infrastructure collapses.

Photo courtesy of Sky Terry and TJ Terry Volunteer pilots throughout the West Coast contributed to the disaster logistics drill on April 27. Kenmore Air served as a base of operations as it would in a real disaster.

Photo courtesy of Sky Terry Sky Terry (center) poses with the other volunteers after the successful logistics drill on April 27. Related: *Seattle Quake Exercise Highlights General Aviation*

"Shortly after Hurricane Katrina and the Nisqually earthquake [from 2001], I looked at what we faced," said Sky Terry, northwest regional emergency services director for the Emergency Volunteer Air Corps [EVAC] and national disaster aviation director for No Town Left Behind. "I basically looked up and thought about all these guys who are flying around and don't need runways, has anyone thought about them? And sure enough, no one had."

Terry has been organizing these drills since 2009 and has developed this region's pilot network into what it is today. The team has expanded to an average of three drills a year, establishing a better and better response to a potential disaster. The drills now extended down the West Coast in a joint effort with California pilots.

"That's really amazing," Terry said. "What we're building out, as far as a resource, is lessons learned from prior drills. Now we're getting to a standard of doing at least three to four drills a year and each one we pull from the previous one to make adjustments to the next one. The level of development and refinement that's occurring with these exercises is phenomenally high so by the time we actually ever have to use this, it's going to be really solid."

As Terry and the volunteer pilots refine their response, the organization as a whole has been gaining traction among county government emergency response plans. DART as it exists in Washington is a concept merged

between Terry's EVAC and California's DART concept — where Terry brought the medical emergency supply response and DART brought an emergency food supply response to a disaster.

"We're still in development stage and that's what these exercises are all about, but we'll get there," said Bill Herrington, a volunteer pilot based in Walla Walla.

The Washington volunteer pilots first began joint drills with California's DART in 2015 and each year pilots transport actual emergency supplies along routes they would use in an emergency. Additionally, once the food or emergency supplies reaches its final destination, it's donated to a food bank or charity organization.

Photo courtesy of Sky Terry and TJ Terry
Volunteer pilots throughout the West Coast contributed to the disaster logistics drill on April 27. Kenmore Air served as a base of operations as it would in a real disaster.
Related: Seaplane Operators Prepare For Disaster On Lake Washington

"This wouldn't have gotten to this point without their help."

Terry credits Kenmore Air, Washington Seaplane Pilots Association and the Washington Pilots Association as the first organizations who both understood his team's vision and provided the equipment and location to run these drills.

"Assistance to the sick and injured during a major disaster is an important task," Kenmore Air chief pilot Chuck Perry said. "As the largest seaplane operator in the United States, we feel an obligation to be part of this program. In the event of a loss of surface transportation, we may be able to help."

"We have this annual huge multi-county interactive response effort that's growing each year exponentially," Terry said. "At the same time, the payload is going to go up exponentially to the food bank for the counties that develop the DART and they get this awesome boost in the off-season. It's awesome to be able to prepare for the future and help the present at the same time in a live exercise."

Terry added that as counties adopt a new DART in the network, that county will be the recipient of future drill supplies. This year, with Kenmore Air as the last stop, the supplies will be donated to Mary's Place in Kenmore.

"Our state owes [Kenmore Air] a huge debt of gratitude," Terry said.

The April 27 drill established better logistics as pilots work out supply chain routes. The emergency supply drop was flown across Washington from Walla Walla to Renton earlier in the week before pilots brought it to Kenmore.

Herrington heads the Walla Walla arm of the DART, which will serve as a primary supply feeder station in the event of a disaster. Walla Walla was chosen for its location in eastern Washington, which is less susceptible to an earthquake disaster than the west side of the Cascades.

"This is all about options," Terry said. "We're going to have to have this resource unless we want to watch people die who were savable."

Bode Miller Debuts Drowning Prevention PSAs

https://www.msn.com/en-us/health/health-news/bode-miller-debuts-drowning-prevention-psas-and-reveals-wife-is-pregnant/ar-AAB577N?ocid=spartanntp
05-08-2019

For the past year, Nicole Hughes and Morgan Miller have leaned on each other from across the country as they've navigated an unthinkable journey.

Morgan and her husband – Olympic skier Bode Miller – lost their daughter Emmy last June. After the 19-month-old slipped out of a neighbor's house and drowned in a swimming pool. That same day Nicole's 3-year-old son Levi also drowned after he wandered outside during a family vacation.

The families channeled their grief into action, partnering with the American Academy of Pediatrics to create new PSA's alerting other parents to the dangers of drowning, a top cause of death for 1-to-4-year-olds. New guidance says swim lessons can help children after age one and home pools need to be surrounded by four-foot fencing and a locked gate.

Bode Miller revealed to "CBS This Morning" on Wednesday that his wife, Morgan, is expecting a child and was joined by Nicole Hughes, who is also expecting, to discuss some of the new guidelines to help prevent a tragedy like the one they both experienced.

For Miller, what he finds most terrifying about child drowning incidents, including his own, is that they tend to happen during "non-swim time." He also emphasized that this is the time time of year parents should be particularly cautious.

"Kids are crafty and they get out fast and this whole process, I think the terrifying part about this time of year is you know the kids are thinking it before the parents are," Miller said. "It happens quick and it happens when you're not swimming. You're cooking and the kid's gone for that amount of time and you're left with a lifetime of, sort of, regret."


© American Academy of Pediatrics

The death of Hughes' son unfolded similarly. He slipped out of a room full of people including her own parents.

"It was so fast and you think there's time and you think that it's not going to happen to you," Hughes said.

A huge part of their message, Hughes said, is to make sure that parents and pediatricians start treating thinking about the safety measures around pools much like we do car seats or seat belts in cars.

"Drowning is just as deadly and just as preventable as car accidents and as these illnesses. So if we could just approach it with that same urgency. It is 100 percent preventable. You can keep your child alive," Hughes said.

"These are things that were sort of an evolution of safety," Miller said. "And there's a bunch of stuff coming out right now that I'm excited to launch in the market ... Parents can't watch a piece of water, you know a pool, all the time. It's just not realistic."

For drowning prevention tips and more information about the updated water safety guidelines, visit the American Academy of Pediatrics' website. You can watch all of the PSAs from the new AAP campaign here.

LINE SIGNALS

By Mark Phillips

Underwater communication is vital for the success of a search pattern and the safety of the divers. It should be a goal for all PSD teams to eventually own and utilize an electronic underwater communication system.

When plain speech is used to direct the diver and give the diver the ability to talk to the surface, efficiency and safety improve. Some electronic communication systems are wireless and depend on separate receivers and transmitters.

Since these systems are capable of failing, a suitable system of communication must be employed as a backup. Though we teach students to use voice communications sparingly, this does imply that the communication system is or could be the primary communication method between divers underwater or a diver to shore support personnel at the surface. Relying on any single system is not wise and a backup plan must be in place.

Since our divers are diving with search lines that afford them physical contact with their surface line tender, a tug or pull signal must be in place and employed as a back up to an electronic communication system.

Some teams insist that the search line tug / pull method of communication be the primary method of communication with the electronic communication system used as a backup. While this seems to be backward thinking, a diver dependent on an electronic communication system will have to stop and press a microphone button each time he needs to speak, ask direction, acknowledge a message, or answer a question. In order not to miss area, the diver will usually stop forward momentum, respond and then begin again. This takes up time, burns air needlessly and creates inefficiency.

Newly formed teams may not be able to afford the expensive electronics and will rely solely on line signals. Teams growing into communication systems will use a tug system of pull signals as their primary means of communication between the diver and shore.

Since this means of communication is dependent on diver to tender and tender to diver contact, the line tender must pay constant attention to the diver's position and be alert to any signals sent and be aware of changes in movement or uncharacteristic events.

Since the tender is going to be near the water edge, the tender must wear a personal floatation device. With the search line, the tender must be able to change the direction of the diver, recall the diver or stop the diver at a moment's notice.

Line pull signals are varied and most likely got their start a very long time ago. As early as the 5th Century BC., early Persian writings report divers being sent into the ocean to salvage sunken treasure. By this time, underwater salvage had already been developed and breath hold divers were in constant demand. A rope and a rock for weight were all that was needed to get the divers to the bottom. Getting back to the surface was the trick.

***Table 8-3. Line-Pull Signals.* (U.S. Navy Diving Manual, Revision 4)**

	From Tender to Diver		**Searching Signals (Without Circling Line)**
1 Pull	"Are you all right?" When diver is descending, one pull means "Stop."	**7 Pulls**	"Go on (or off) searching signals."
2 Pulls	"Going Down." During ascent, two pulls mean "You have come up too far; go back down until we stop you."	**1 Pull**	"Stop and search where you are."
3 Pulls	"Stand by to come up."	**2 Pulls**	"Move directly away from the tender if given slack; move toward the tender if strain is taken on the life line."
4 Pulls	"Come up."	**3 Pulls**	"Face your umbilical, take a strain, moveright."
2-1 Pulls	"I understand" or "Talk to me."	**4 Pulls**	"Face your umbilical, take a strain, move left."
3-2 Pulls	"Ventilate."		
4-3 Pulls	"Circulate."		
	From Diver to Tender		**Searching Signals (With Circling Line)**
1Pull	"I am all right." When descending, one pull means "Stop" or "I am on the bottom."	**7 Pulls**	"Go on (or off) searching signals."
2 Pulls	"Lower" or "Give me slack."	**1Pull**	"Stop and search where you are."
3 Pulls	"Take up my slack."	**2 Pulls**	"Move away from the weight."
4 Pulls	"Haul me up."	**3 Pulls**	"Face the weight and go right."
2-1 Pulls	"I understand" or "Talk to me."	**4 Pulls**	"Face the weight and go left."
3-2 Pulls	"More air."		
4-3 Pulls	"Less air."		
	Special Signals From the Diver		**Emergency Signals From the Diver**
1-2-3 Pulls	"Send me a square mark."	**2-2-2 Pulls**	"I am fouled and need the assistance of another diver."
5 Pulls	"Send me a line."	**3-3-3 Pulls**	"I am fouled but can clear myself."
2-1-2 Pulls	"Send me a slate."	**4-4-4 Pulls**	"Haul me up immediately."

ALL EMERGENCY SIGNALS SHALL BE ANSWERED AS GIVEN EXCEPT 4-4-4

Food, treasure, salvage or profit was the motivations of these early divers and as early as the 3rd Century BC; Greek laws regulated those who dove for sunken treasure.

It is safe to assume that some form of tug system was used to communicate with the divers. Even if it was as simple as "One tug means pull me up".

In 1998 Historical Diving Times published an article titled: For the Moment, Let's Forget the Diver. In it, the author writes the following:

The diver-surface link is one that we would therefore do well to explore further, when considering information on diving from any period. Having noted equipment, exploits, depths or times in the usual logbook fashion, forget the diver for a moment. Go over things again, from the viewpoint of those on the surface. This is a simple analytical technique, which often helps to explain so much more about what really went on.

To illustrate this, take Oppian, the second century AD Greek poet from Cilicia, and the only ancient source to mention directly those on the surface.

This occurs in the fifth book of his Halieutica *(on hunting and fishing). His text is particularly important, as it provides the best details we have of the diving technique used by ancient breath-hold 'sponge cutters'. Naturally, the narrative contains high drama, which starts underwater but ends on the surface.*

"Shaking repeatedly the rope he bids his comrades pull him up. And the mighty sea-monster and the companions of the fisher pull

at his body rent in twain, a pitiful sight to see, still yearning for ship and shipmates. And they in sorrow speedily leave to land, weeping over the remains of the unhappy comrade." *

In 1535 Guglielmo de Lorena designed a diving bell that divers used to work on sunken barges in Lake Nemi, Italy. Though it may not have been the first recorded use of a diving bell, it was certainly one of the earliest.

Over time, the motivations of divers and technological advancements have not changed a great deal and as equipment and technology improved, so did the ability of the dive to stay underwater longer. When diving suits came of age and divers were able to be fed air through hose lines, line signals became the only method of communication between the diver and the surface. Underwater communications were dependent on line tug or pull signals and as the need progressed, a variety of complex systems of line signals were developed.

The US Navy currently uses a variety of modern communication technologies but still holds to the rope pull methods as well. **See Table 8-3** - from the U.S. Navy Diving Manual, Revision 4**.**

The Scientific Diving community has a different set of signals. They are much simpler in design and are more recognizable to the present day Public Safety Diver. These are the line signals developed by Scientific Committee of the World Underwater Federation (CMAS) published in their manual, Scientific Diving: A General Code of Practice.

PULLS OR TUGS ON ROPE	TENDER TO DIVER	DIVER TO TENDER
1 Pull	Are you all right?	I am all right!
2 Pulls	Go down!	Give me slack!
3 Pulls	Standby to come up	Take in my slack
4 Pulls	Come up!	Haul me up!

The NOAA Diving Manual details a much more complex set of signals that more closely resemble those of the US Navy. But NOAA also includes **hand squeeze** signals. *These* signals resemble the much less complex line signals sometimes used by Public Safety Divers.

Diver – to Diver Communication		
Signal Title and Meaning	**Hand Squeeze/Line Pull/ Light Flash/ Tank Tap**	**Answer**
OK? Or OK	One	Same
Go	Two	Same
Stop	Three	Same
Surface	Four	Same
Emergency or Come Quickly	Five or More	Go quickly to signaler
All signals, except the emergency signal, should be answered, by repeating signal, when received.		

Line signals are not exclusive to the diving community. Line signals can be used anytime a rope separates two people. From rescue to exploration, line signals have developed as one of the simplest means of communication. Acronyms like "OATH" are used to identify line signals in some rescues circles.

1 Tug = **O**K. Can be to ask if OK and to answer
2 Tug = **A**dvance or give me rope
3 Tug = **T**ake up rope. I'm coming back
4 Tug = **H**ELP.

Even the Civil Defense identified lifeline signals as a method of communication for rescue workers working off a lifeline. They identified a lifeline as "A means of communication for members of a rescue party who must enter hazardous enclosures or toxic atmosphere. It enables them to keep in contact with persons

outside by sending rope signals." Their standard lifeline signals for rescue workers were:

a. **One Pull – Stop (if moving), OK (If at rest)**
b. **Two pulls – Advance**
c. **Three Pulls – Come out at once**
d. **Four Pulls – Distress – come at once**

The following are perhaps the most used line signals for Public Safety Dive Teams.

PSD LINE SIGNALS

TENDER TO DIVER	DIVER TO TENDER
1 Tug Are you OK?	1 Tug: OK!
2 Tugs: Stop, change direction and take out more line.	2 Tugs: Give me more line.
3 Tugs: Come to the surface.	3 Tugs: Object of search located.
4 Tugs: Stop and hold position	4 Tugs: Emergency!! Send help

ANY TIME THE ROPE GOES SLACK AND CONTACT WITH THE DIVER IS LOST, AN IMMEDIATE DIVER EMERGENCY IS DECLARED AND ACTED ON.

Tethered Diving

There are two basic thoughts about physically attaching a line to a diver and having it tended. One is that the diver should always be attached via a quick release. The quick release provides the diver the opportunity to self-rescue if the search line becomes fouled underwater and becomes a hazard.

The other requires the diver to stay connected to the tether at all times – even if the line is fouled.

With a quick release, if the release is prevented from accidentally opening the diver is in control and has the ability to become untethered underwater. Once free of the tether, there is no direct path to the diver for a rescue or backup diver. However, it is argued that PSDs should be trained for contingencies and able to make that decision.

Divers who maintain the connection of the search line have the ability to cut their line or release it if warranted but work with the understanding that the search line is a line back to shore and a path of help of needed.

Because the majority of public safety diving is in zero or low visibility water, the search line becomes a critical part of the safety mechanisms and communications systems put in place. Let's use a little common

Basic Tethered Search Line

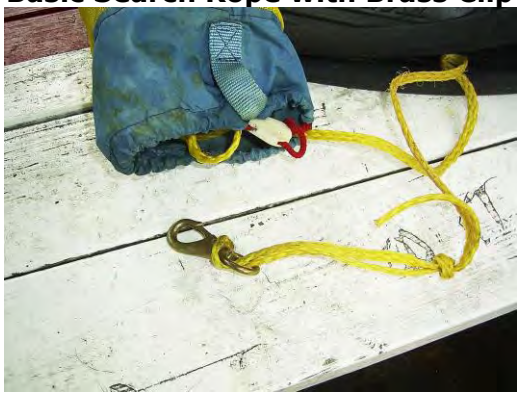
Measure and Tying the Hand Loop

Loop Position

sense too – if you have 100 feet of visibility and a 20 depth lake, you probably do not need to be tethered.

When the diver is suiting up, the tender can take the necessary time to help ready the diver. Since we are using tugs or pulls on the search line, the diver will be most comfortable using a hand loop. This loop needs to be just out of reach of the fingertips of the diver. This will give the dive a small amount of slack in the line and allow the diver to maintain orientation to the shore without being skewed.

Basic Search Rope with Brass Clip



Diver With a Hand Loop

When line signals are giver, they must be given on a taught search line. This means the Tender MUST keep the search line tight enough to "feel" the diver" without applying so much force that the Tender pulls the diver off pattern.

When a signal is given over a taught line, it is NOT necessary to grab a foot of slack and yank as hard as possible. Doing so is unnecessary and can cause a very wide variety of problems.

For a mental image, imagine you are the diver and just got hung up in a trot line. The barb of one of the treble hooks had barely pierced the skirt of your mask. The Tender, seeing your bubbles become stationary, wants to ask if you are OK.

The Tender can:

- A: Give the search line a hard yank and pull the hook through the skirt and into your eye or
- B: Hold the search line in one hand and while the line is taught, rock his hand an inch or so sending a single tug downline.

I am pretty sure we will all choose option B.

It is not always necessary for the diver to acknowledge a signal from the tender each time a command is given. However, the tender ***should know beyond doubt*** that a line command was received and followed.

If a diver is given a signal to stop and turn, the tender should see bubbles change direction and know the command was followed. If there is no change of direction and continued movement is tracked, the Tender will resend the command down the line.

If a diver is given a command signal but does not respond to the command or change position within the diver's usual timing, the tender should automatically alert the backup diver. A single tug to ask if the Diver is **Ok should ALWAYS be acknowledged**. A diver remaining stationary who fails to acknowledge a single tug, should be cause to send the backup diver.

When the backup diver is gearing up before the dive operation begins, the backup diver should be outfitted with a short tag Line. Some refer to them as a contingency line or strap. The line or strap is or a relatively short length, 3 or 4 feet and has 2 brass snaps, one on each end. One end is attached to the backup diver and the other end with the excess

line is stored in a BC pocket.

Backup Diver "Tagging On" the Primary Diver Search Line

If it becomes necessary to activate the backup diver, the diver will remove the lose end clip from his BCD pocket and attach it **TO** the primary divers search line. This one move allows the backup diver to follow a direct path to the primary diver and even be hands free of the line to assist if necessary and NEVER be off line.

Consider what this means in a zero visibility environment where you may need two hands to work. As long as they do not intentionally go off the search line, you will know where both divers are at all times.

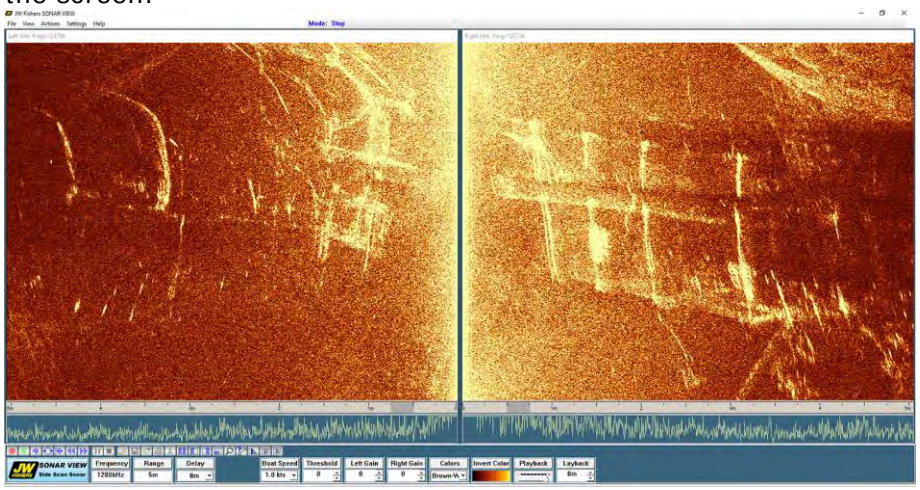
The backup diver may be moving fast and if unaware, may run into the primary diver. Consider adding a stopper knot to the search line. It can be a separate knot with weedeater line threaded through it or it can be the knot where the hand loop is tied. Either way, that knot, training required, will become the marker in zero visibility to slow or stop the forward momentum of the backup diver.

Search line signals can be very basic and simple to complex. Before committing to a single set of signals, consider what your needs are and experiments with different types. But remember, the less complex the system, the better the communication. Practice!

Under stress <u>you will perform</u> as you train.

SPONSOR NEWS

JW Fishers Mfg. has been producing Side Scan Sonars (SSS) since 1992, when the first thermal printer SSS was introduced. The original SSS came standard with a 17" thermal printer which allowed the operator to display the ocean floor on thin thermal imaging paper. JW Fishers expanded the technology and moved towards software-driven solutions in the mid-2000's, allowing customers to discard the heavy paper-based printer in favor of a computer-based graphical user interface. Today, Fishers' SONAR VIEW software provides the operator with complete control over the system's operating parameters. Users may choose between 10 different scan ranges and 8 color schemes. With a GPS unit connected, position coordinates are automatically captured with the side scan data. Operators simply hover the computer mouse over a target and the GPS position coordinates are displayed on the screen.



The James River, a tributary of the Missouri River, is over 700 miles long and drains an area of over 20,000 square miles to North and South Dakota. A little over 70% of this area is located in South Dakota. River conditions vary across the states, with some parts almost still while others send rushing waters at over 10 knots across the state. Floods often occur after snowmelt or heavy rains, as water easily breaches the James' low banks, and such floods tend to cover a significant portion of the floodplain.

Beadle County is located in east-central South Dakota and is home to roughly 18,000 people. In December of 2015, the Beadle County Emergency Management (EMA) office purchased JW Fishers' Dual Frequency 600k/1200k Side Scan Sonar system. The SSS is called upon when state and local waterways need to be searched or surveyed, and that is exactly what happened this year when two individuals and their truck went missing.

In March of 2019, authorities reported that a 2000 Mack CH600 garbage truck was northbound on SD-37 near the James River bridge when the vehicle left the roadway. Based on the initial evidence, investigators believed there may have been an equipment failure. The vehicle went through the guardrail, vaulted an embankment, and landed in the James River. Authorities began searching the James River in Sanborn County after discovering a damaged guardrail along SD-37 near the James River Bridge.

Not long after the incident, the Miner County Sheriff's Office began receiving calls from family members of the two men, reporting that they had not been seen since Thursday. The Mack truck was located on Saturday during a search of the James River, and the bodies of the two occupants were found during the recovery of the truck the next day. Authorities reported that the speed of the flood waters on the river made the search and recovery difficult.

A statement from the Department of Public Safety noted that several state and local agencies assisted in the search and recovery efforts. While any loss of life is always incredibly tragic, JW Fishers is immensely proud of its small part in the recovery efforts and in bringing closure to these two grieving families.

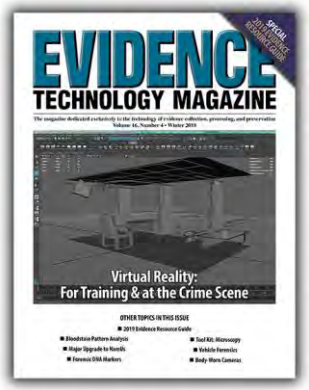
KLEIN MARINE SYSTEMS, INC. ANNOUNCES

PSDiver Magazine is a quarterly Issued magazine and available only digitally. Our subscriptions require no personal information and we do not share our emails lists. The magazine can be downloaded from our web site any time. We use a bulk email service to send notifications out that a new issue has been released. In the email we include a direct download link and some basic information about the issue. We will not blow up your email or share your email address.

If you have a business and would like to advertise with us, our current rates are 300.00 USD per issue. There is only one price and only one size ad.

Our email list is around 10,000 and because we are digital only and internet based, we have worldwide distribution.

If you would like to join our advertiser / sponsor family, we have a place for you. Email Mark@PSDiver.com for more information.



The PSDiver ASE Workshop

In May of 2018 we launched the second PSDiver Workshop. The **PSDiver ASE Workshop** (**A**utomobile **S**ubsurface **E**xtrication).

When a vehicle goes into the water, it is rarely an accident. Occupants are not always able to escape; sometimes they are *purposefully prevented* from escaping. If the entry is witnessed and there is a potential for rescue, this workshop includes how to perform a ***Hasty Recovery*** when recovery of the entire vehicle might be quicker that attempting to extract victims from the vehicle underwater.

If rescue is not an option, the workshop offers a range of methods to bring the vehicle to shore. Methods include utilizing traditional tow hooks and equipment to air bag rigging and deployment to lift the vehicle and pulling it to shore by hand.

It can be difficult for teams to learn these or similar techniques. Teams may only have the opportunity to perform these techniques on actual vehicle recoveries and that training potential for the team is almost always lost.

We Bring Our Own Car!

Depending on your location, we can solve that problem. We bring a specially designed and environmentally clean vehicle with us.

In the PSDiver ASE Workshop, teams will learn how to **choke, cinch and seize** ... Rigging and Lift Bags. This is an extraordinary team, department or regional training program.

We are working to take away your excuses. With funding provided by corporate sponsors, we have kept the cost of our workshop extraordinarily reasonable.

For announcements, schedules and locations of the PSDiver SURVIVAL and ASE Workshops, follow our PSDiver Monthly Facebook Page
Join our Facebook Public Safety Divers - PSDiver Group
or visit our web site www.PSDiver.com.

If you would like information on becoming a sponsor or hosting a workshop, email Mark Phillips at Mark@PSDiver.com

Continuing Education

Tabletop Scenario Exercises

Columbus Drone 22 assisted Polk County Emergency Management with assessing a boat floating freely on Lake Adger after last night's severe storms in the Mill Spring area.
Photo taken at Lake Adger Dam @ Hwy 9

Recently I shared these photos with our PSDiver Group and asked, "What would your team do?" The interaction and comments were very interesting. We have turned the photos into a training scenario for you to consider conducting as a tabletop / discussion exercise.

One issue of this scenario is an unfortunate reality. If a fire or police department has a dive team, they are usually tasked with all things water. But not all things water are within the scope of the training of a dive team. Part of this exercise could be used to create some interactive communication with administrators who may make incorrect assumptions of a dive teams capabilities - because they always respond to all things water.

Someone or two individuals will have to be the scenario master(s) and be able to guide the scenarios. They will need to have knowledge and understanding of the work as well as potential hazards that may be faced. If necessary, they can contact us and we can give them guidance but common sense alone is a very good guide. Actions should be vocalized by participants and each

decision and consequence considered. For example, a volunteer FD team receiving a 911 call may not have anyone on duty. How will the call go out? Where will the team members meet? Who will bring the boat? Who decides what gear will be used and how will it get to the site? Work this as a real call from beginning to end.

Work through the scenarios twice.

First, focus on the situation as it is - unoccupied and precarious. Consider the experience of your team members individually. This may or may not require a good boat operator, divers, swimmers, Personal Water Craft, helicopters, cables, tow truck, semi-truck flatbed trailers, lift bags, bags of candy, satellite imagery, topographical maps, dam failure and massive flooding downstream…. Or not… But, for example, if your boat operator is good but new, and just learning the boat, what happens if the approach is too fast and a wake is created? Is there a current or a pressure differential to worry with? How many people will it take to perform the job you determine is necessary and what equipment will you need? Do you have all of it? Is your responding manpower properly trained? Plan the job with only your team and the equipment you have available.

Next, as you progress, add a second scenario where the boat is occupied by four adults who have been drinking. Are they wearing life jackets? Can they respond to instruction? Can you get close enough to talk with them? Consider the boat lost power and was blown to its current location by wind. Is there an immediate life threat? Maybe yes, maybe no…. maybe there is a medical problem.

Once you get through the second part of the scenario, modify it a bit. The boat is exactly as pictured. Timmy and his little brother were playing on their father's boat while Dad was visiting with the pretty lady three boats down at the dock. One of the boys untied the boat and the wind pushed the boat away. By the time anyone noticed and could react, the boat had drifted to where it is now.

Timmy is 4 years old. Neither of the boys have a life vest on.

A 911 call has activated your team. What do you do next?

Resources

DAN: Divers Alert Network
Scuba Diving and Dive Safety Association
Medical Information Line 1-919-684-2948
24-Hour Emergency Hotline 1-919-684-9111 to help divers in need of medical emergency assistance for all incidents

ChemTrec – Haz-Mat / Chemical Spill Information 1-800-424-9300.

Centers for Disease Control and Prevention
1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636)

National Suicide Prevention Lifeline
Call 1-800-273-8255 Available 24 /365

NAMI: National Alliance on Mental Illness
Help Line 800-950-6264

First Responder Support Network

The mission of the First Responder Support Network is to provide educational treatment programs to promote recovery from stress and critical incidents experienced by first responders and their families.

THE CODE GREEN CAMPAIGN

We call code strokes, code STEMIs, and code traumas. It is time we called a code alert on our mental health.

Crisis Resources

IAFF RECOVERY CENTER

Treatment for successful recovery from substance abuse, PTSD and other co-occurring behavioral health

NOTES:

Don't jump ahead!

Continuing Education "Boat on Dam" Scenario.

This is how they did it:
https://www.facebook.com/townofcolumbusfd/videos/349086922388145/