PHOTO AP/JESSICA HILL

A Connecticut State Police dive team member searches Pine Lake in Bristol, Conn., for possible evidence in a homicide case. Public safety divers are specially trained in several techniques to make sure evidence found underwater is properly preserved in order to be further examined and possibly presented in court.

Police Divers & Underwater

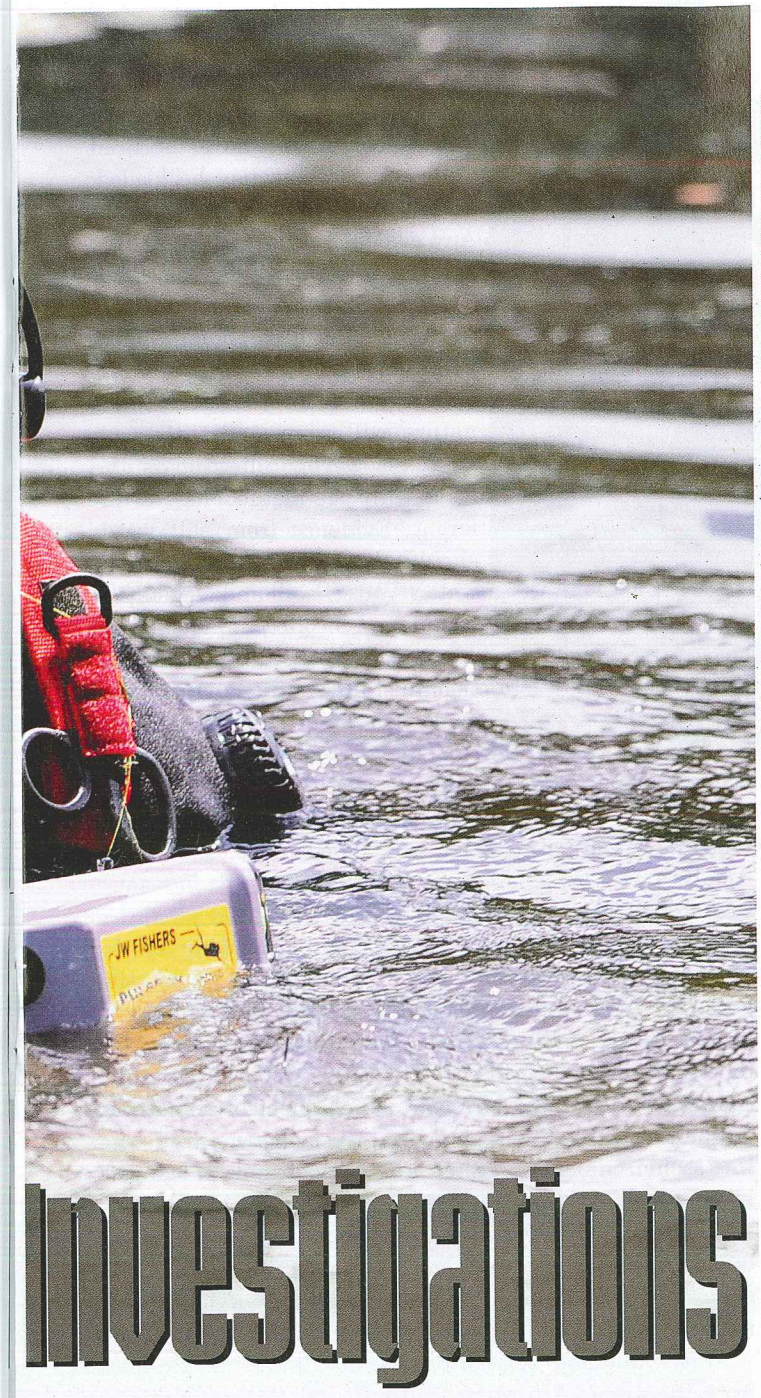
Treading water on the scene

Whether an investigation is conducted on land or under water, the basic principles of investigations are the same. Unfortunately, when it comes to underwater investigations, there is no widely accepted set of standards. Training is critical, as each agency establishes its own best practice. In order to become a public safety or police diver, one must possess skills outside of those learned as a recreational SCUBA diver.

Public Safety vs. Police Divers

Public safety and police/forensic divers "are trained in a host of techniques that pertain to the preservation and recovery of items deemed of evidentiary value for potential criminal prosecution," says Michael Mallon of the Miami-Dade Police Department's Special Patrol Bureau. They are looking for anything associated with the crime: bodies, vehicles, drugs and paraphernalia, weapons, clothing, tools, identification or other stolen/missing items.

"Since December 2001, the MDPD Underwater Recovery Unit (URU) has participated in 'Operation Turbulent Trident,' a multi-agency task force that conducts comprehensive searches for parasitic devices on the hulls of cruise ships and freighters at the ports of Miami, Everglades, West Palm Beach and Key West," Mallon says. " 'Operation Safe Port,' another multi-agency security detail, conducts



Investigations

By Gailynne M. Ferguson

comprehensive searches for explosive devices that may be attached to cruise ship and freightliner hulls, fuel barges and both domestic and foreign Naval ships at the Port of Miami."

Additionally, the URU conducts bridge sweeps, waterfront property searches and seawall searches for IEDs when dignitaries are in Miami.

Bud Kauffman, Assistant Chief of the Water Rescue Division and Chief of Dive Operations of the Susquehanna (Pa.) River Rescue and Emergency Services emphasizes that police/forensic divers experience different conditions than typical recreational divers. "(Public safety divers) must be detail oriented, learn to conduct searches and operate all of their safety equipment without being able to see their hand in front of their face without a light."

"Recreational divers are trained to dive within a narrowly defined circumstance … from a mission perspective," says Michael Gast, President of the National Academy of Police Diving.

Several other experts agree that recreational and public safety/police divers differ in their mission and purpose.

"Recreational SCUBA divers want to relax and have fun. Their training is designed to 'reduce stress,' not to find the item safely under stress. Public safety divers' training must induce or replicate the stress of an actual dive," says Deputy David Patterson of the Stearns County (Minn.) Sheriff's Office.

Using recreational divers, agencies take a big risk on losing the case due to poor chain of evidence, incomplete documentation and increasing liability issues. The more hands the evidence passes through, the less reliable it will appear in a court of law.

"Forensic diving is specific," adds Sgt. Blake Gilmore of the Massachusetts State Police Underwater Recovery, NCOIC. Gilmore's unit partners with the U.S. Navy, Coast Guard, FBI and DEA, along with several state and local agencies and their own detectives.

Not all public safety divers are law enforcement officers and departments realize that the divers need the backing of an agency such as police, fire, rescue, etc., regardless of whether they are employed by the agency or volunteering their time. "If one does not have a basic understanding of the physics and physiology of diving, many things are overlooked," says Gilmore. The all-volunteer staff of the Susquehanna River Rescue are public safety divers made up of police, fire, EMS, water rescue and many other walks of life.

"Those who are not law enforcement officers are sworn in as special police through the (Dauphin County, Pa.) District Attorney's office in order to collect, document and maintain the chain of evidence," Kauffman adds. "Though they have the authorization to conduct the underwater investigations on behalf of the agency and testify in court, they are not granted arrest powers. A trained and organized team sponsored by a recognized organization will have their own insurance and expertise to work alongside of the agency. They can also offer the department investigative advice on locating and recovering evidence."

Public safety divers are used in practically every body of water: lakes, ponds, oceans, rapidly moving water, swamps, waterfalls, low dam heads, flood waters, canals, rivers, streams, quarries, caverns and natural springs, as well as man-made environments such as ship bilges or water storage tanks of flooded man holes, wells and swimming pools. Digester tanks in sewage treatment facilities can be as deep as 30 feet and are often sites where bodies and evidence are disposed of due to the chemical decomposition of the matter.

Underwater Techniques

Many of the same techniques that are used for

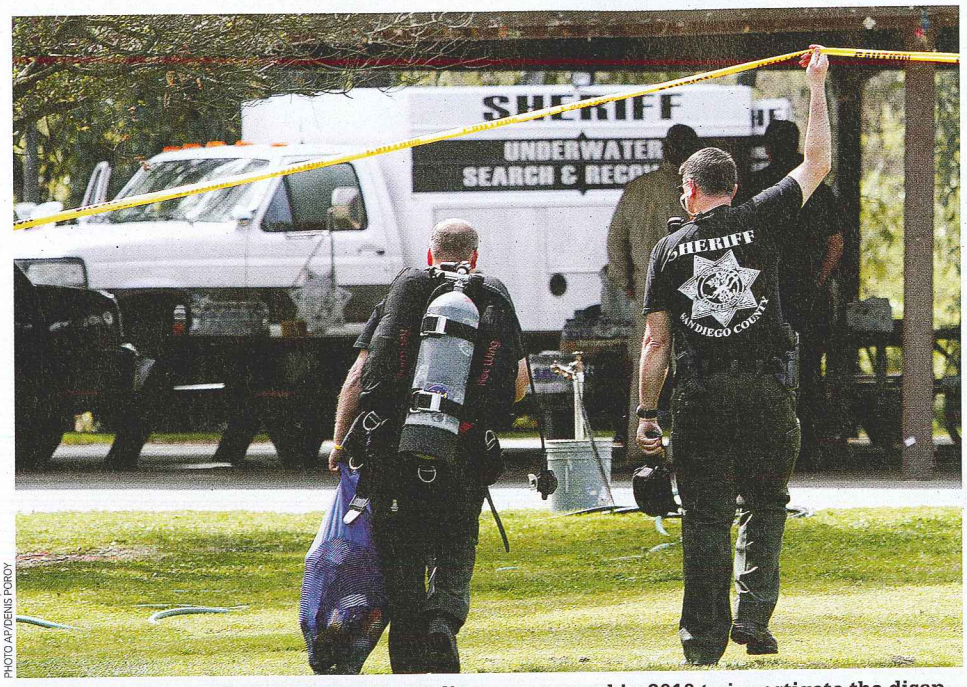


PHOTO AP/DENIS POROY

San Diego County Sheriff's Department divers were used in 2010 to investigate the disappearance of a local teenage girl.

surface documentation are the same as underwater, but all underwater investigations must start on land. Investigations are a two-tier process: Surface investigations and underwater (or sub-surface) investigations. Surface investigators need to look for tire marks, drag marks, footprints, casings or any other evidence that may help them to determine what they may be looking for and where those items or people entered the water. The surface scene and the evidence found there must be preserved and secured by the dive team.

"The surface investigator must know what they want the evidence to do," Kauffman says. "Do they need fingerprints from the evidence to prove his case or is the evidence just corroborating other evidence or statements provided by witnesses or accomplices?"

If water conditions and environments allow, the evidence is photographed under water and digital video is used to document its position related to other items in the area such as the body-to-weapon or body-to-vehicle on a dive slate. Also documented is the geographic location of the items as it relates to public accesses, beaches, etc. Any details the diver can see would also be documented in this fashion. A marker may be placed on the surface above the evidence for measurements by tape, range finder or even a GPS marker. Depth, water temperature and bottom consistency should also be noted. Side scan sonar and GPS are also used to pinpoint locations. Surface photographs and detailed surface sketches should also be prepared, including points of measurements.

Fingerprinting and functionality/ballistic tests should be packaged in the water if that is where it was found. It is usually placed in airtight PVC tubes or bags prior to removal from the water in order to prevent further destruction of trace evidence.

Weapons should never be fired underwater. They may be loaded, taint the scene or injure someone. Any evidence packaged by a diver is brought directly to the land-based receiving investigator where the hand-off is often photographed. Processing then occurs in the lab. Like anything left to the elements, nature will compromise the evidence. However, collection is the same, only the methodology is different. Evidence from salt water should always be placed in freshwater. Water, soil and vegetation samples are collected at the site of recovery. The surface investigation must inform the lab that "wet" evidence is being submitted. Chain of custody is very important and is done in exactly the same manner for underwater investigations as it is with every other investigation, Gilmore says.

Search Methods & Tools Used

Due to low visibility, hand-over-hand searching is the primary method used for bottom composition (mud, silt, grass, etc.). Other methods involve walking search patterns, in-line search patterns, rope search patterns and PVC pipe grids or rigid grids. Divers try to scoop items into a container with a shovel, mesh panel, sheet or something without handling the items so that the evidence is collected in its environment, keeping it preserved and unchanged. If the object/body is in a state of decomposition, moving the item can cause it to break apart. This too needs to be scooped to bring the object up with the surrounding structure. Often times, bodies are placed in body bags underwater and transported to the surface.

Water, silt and vegetation are also taken as samples from the scene. According to Kauffman, "Microorganisms called diatoms are distinctive to each body of water and can be examined in the human body. Silt or vegetation under a victim's fingernails might tell you if they struggled on the bottom or if they were placed there. Maybe the dirt and silt don't match, raising the issue that there may be another crime involved. Samples are also collected for safety reasons, should a diver get sick or develop a rash after diving."

Tools for underwater investigations include underwater metal detectors, video poles, boats, side-scan sonar, underwater video, analyzers for gas analysis, measuring devices, high visibility underwater markers, depth gauges, underwater propulsion units, underwater cameras, standard recreational buoyancy control devices/gear/tanks, dry suits, full face wireless communication masks, diver harnesses, standard (sinking) climbing rope, polypropylene (floating)

rope, mesh bags, mesh sheets, mesh body bags, PVC weapon sleeves that are air tight, lift bags, line spools, remotely operated vehicles (Seabotix), drag boards, drag lines, dive boats, generators, chainsaws, ice tongs, breaker bars, heaters, magnetomers and surface shelters. Each agency determines what type of suit (dry or wet) is best for the conditions they encounter, but wetsuits are more affordable. Many agencies dive between 10–150 feet. Should they need to go deeper than 150 feet, it is done only for brief periods of time. With technical dive training, tri-mix or a rebreather system, divers can go just about anywhere. A SCUBA diver using regular air can reach a maximum depth of 218 feet in sea water and with a special gas mix, the physical limit is about 400 feet; however, there are many safety and physiological issues that can result from a deeper dive.

Diving is not without its risks. Besides physiological issues, dangers such as hazardous water conditions (including temperature, lack of sight from darkness or dirty water, exposure to elements, contamination and biohazard exposure), debris, entrapment of a diver, sharp submerged objects, entanglement, equipment failure/malfunction, air consumption, depth and gas considerations, panic, time management, enclosed environments, aquatic life (alligators, snakes, amoebas, protozoa, etc.), currents, caverns, caves and the possibility of being sucked into water ducts or tubular enclosures are all risks for divers. In addition to sewage, underwater cables for power and telephone, pipelines for oil and gas and other debris make locating evidence difficult and place divers at risk.[1]

When it comes to court procedures, public safety and police/forensic divers testify to conditions and documentation; to what they did to conduct the search and what was found. They testify to the chain of evidence and evidence details. Investigators need to know how long an object has been in the water, as well as the evidence's condition and its position. When SCUBA accidents occur and foul play is suspected, expert witnesses like Brett Scott Galambos, a Master Dive instructor and associate of Robson Forensics, are called in to investigate, document and retrieve evidence so that they can testify on whether or not it was an accident. "That which is not investigated, studied and documented during the retrieval process cannot be used to determine the real and potential cause of an accident," Galambos says.

PHOTO COURTESY BUD KAUFFMAN, SUSQUEHANNA RIVER RESCUE AND EMERGENCY SERVICES

Susquehanna River Rescue and Emergency Services responded to a boating accident rescue on the Susquehanna River. While assisting the boat owner with property recovery, the team located three loaded hunting rifles, in direct violation of Pennsylvania hunting laws.

What's Next?

As of now, no set guidelines or standards exist and each agency is tasked to establish its own policies, procedures and training. Programs can only be as good as the standards an agency sets and the instructions they give. Some agencies bring in divers from the Professional Association of Diving Instructors (PADI) as certified rescue divers, and the searches and procedures are conservative based on what they feel are the best practices. Massachusetts State Police recruits divers certified as recreational divers and then puts them through five weeks of basic training followed by in-service training and specialty training. Hundreds of hours are spent on training public safety divers in order to ensure they have the knowledge to stay safe on the job. "Diving is a perishable skill," Gilmore says. "If your team does not dive regularly, then you will not be as successful as dive teams that train regularly. We average over 300 missions per year. Most local teams do not get over 30 and that may include their training."

According to Mallon, "There are a lot of organizations teaching PSD...which are a derivative from the U.S. Navy dive manual."

"This has been an uphill battle since the '70s," Gast adds. "To date, there are still agency standards that do not interact well across the spectrum. That is why the National Academy of Police Diving began. We are still training with proven and established methods that have been around since 1958. Technology and equipment keep changing, but methodology remains the same."

Kauffman sums up the profession of underwater investigations very simply: "When someone gets rid of something underwater, they think it's gone. 'Out of sight, out of mind,' but often, we can find a firearm that matches a bullet that killed a person. It's like finding the piece of a jigsaw puzzle. If it moves to the water, get the best team you can possibly get to further your investigation. You and your victim deserve it." LOM

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