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An Optimal Combination of Technologies

by Sgt. Wendell Nope, Utah DPS Dive Team Trainer

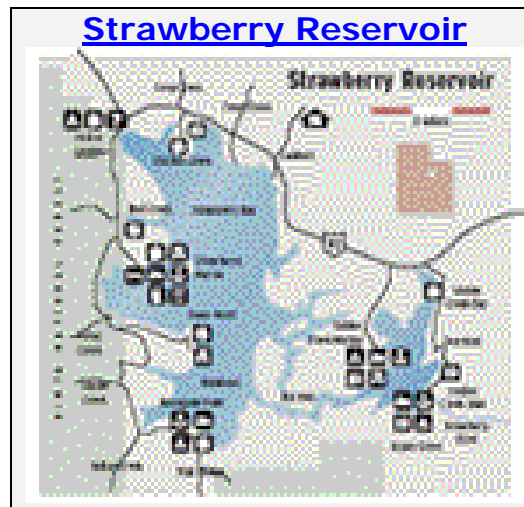
Side-scan sonar, sector-scan sonar, remotely operated vehicles, and divers ... at first glance one might think that these technologies are in competition with each other. I suggest that they complement each other. This is certainly the experience of the Utah Department of Public Safety Dive Team in a major deployment over an eight-day periods in November 2006.

A young couple and two friends began their day on 8 November with intentions of fishing on one of Utah's most well known high-mountain fisheries, Strawberry Reservoir. Their flat-bottomed aluminum fishing boat

served them well until the weather suddenly changed for the worse. Strong winds quickly produced waves that swamped the boat and left them on their own in the frigid water. The conditions were not in their favor: strong winds and waves dashed against them as they swam against the wind/waves, the 40+ degree water drained their body heat, and they eventually slipped below the surface as they

attempted to get back to the boat launch. Their two companions from the fishing boat were able to make it to the opposite shore safely by swimming with the wind and letting the waves work in their favor, even though their chosen route appeared to be a further distance away.

Local Search and Rescue assets, including numerous volunteers, were deployed the moment the survivors reported the incident. A rapid sweep of the shoreline produced no sign of the young couple. Unfortunately, no

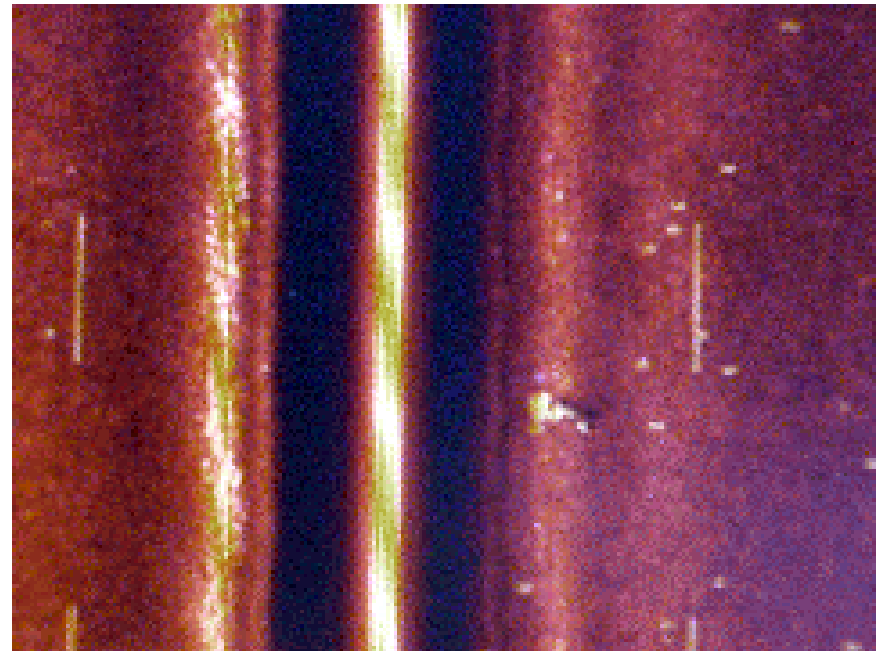


good "Point Last Seen" was evident, but a huge search perimeter was nonetheless established. The Wasatch County Sheriff's Department, under the command of Chief Deputy Todd Bonner, quickly recognized the immensity of this search and sent out a request for all possible manpower and technology to assist. With the winter freeze approaching, this couldn't have been a wiser move. Within mere weeks, Strawberry Reservoir would normally be covered in a layer of ice, sometimes more than three feet thick. A rapid and efficient search and recovery effort was critical, or else the alternative was to wait until spring. No one was willing to accept that alternative and a determined sense of urgency settled in among the searchers.



The Sheriff's Department maintained a marine unit, which consisted of watercraft and surface personnel. The neighboring Summit County Sheriff's Department, under the command of Captain Alan Siddoway, responded to the call with a sophisticated ROV system. The Utah Department of Public Safety Dive Team, under the command of Captain Doug McCleve, responded with a side-scan sonar unit mounted on its Almar Boat, along with its team of eight divers. Of note is that this is a front-mounted stainless steel tow fish built heavy enough to cause the fish to 'fly' directly under the boat, regardless of depth.

A strategy was developed which seemed to make the best use of each asset's strong points - sonar, ROV,



and divers. The side-scan sonar would be used to sweep the search area a quadrant at a time. When a viable target was identified by the side-scan, a buoy would be tossed out and the ROV (deployed from another boat) would go to the site and check out the target with its video camera. Then, the divers would initiate the recovery when a body was confirmed.

Over the next two days, this procedure was employed. No divers were used for the first couple of days. The ROV was used to determine if a possible target was a log, debris, etc. Just at dark, on November 10, the ROV settled down next to the final viable side-scan target of the day and confirmed it to be a human body. Chief Deputy Todd Bonner called for a briefing in the command center to establish a dive plan for the recovery. The body was in 90' of near-zero visibility water and darkness was settling in, as was the below-freezing night temperature. As a dive plan was being discussed, all these elements suggested waiting until the next day to do the dive. Then came a startling announcement ... the body had a thin layer of silt on it and did not have the appearance of either of the two intended victims!



After a brief discussion with the Chief Deputy Bonner, the ROV operator offered another option. It might be possible to grasp this unknown victim's clothing with the 'manipulator arm' and bring him to the surface via the ROV. The consensus was to make the attempt.

Using the video camera to carefully guide the manipulator arm, the victim's clothing was grasped and he was carefully brought to the surface. Dental records subsequently showed this to be a victim of a 2001-drowning incident, whose body had never been found. Due to the climate and water conditions, this was considered a huge success, although it wasn't one of the victims being sought after.



A strategy was adapted with this new option. The side-scan sonar would ID a target; a buoy would be tossed, and then keep scanning without stopping. This increased the coverage considerably. Since they were known to have been dressed in thick winter clothing, the ROV would attempt recovery of the bodies, and so it continued until

the next day, when a winter storm struck.

After three days of storm, the weather finally cleared and our operation resumed. The new strategy continued to produce viable side-scan sonar images that were then checked out by the ROV. The combination of the two technologies allowed almost non-stop imaging by the side-scan. Then, an image showed up that was so clear it even displayed what appeared to be a head, arms, and legs. The ROV deployed to the buoy and dove to the bottom. From its camera was clearly seen a human body, except it was in the advanced stages of decay. Shortly after, the side-scan imaged what appeared to be a large boat and then later, another body. Chief Deputy Bonner then remembered an incident from 1995 in which three young men drowned in a boat crash and had also never been recovered. After careful consideration, the ROV was chosen to grasp the clothing of one victim and recover him.

Just as the body broke the surface, a wallet containing ID floated away from the body and was

Strawberry's Toll

Six people disappeared in three separate mishaps between September 1995 and November 2006 on Strawberry Reservoir. Searchers have recovered the bodies of five:

- * **Catheryn Roundy**, 23, who was in a boating accident with her husband on Nov. 8.
 - * **Steven Roundy**, 29, who disappeared with his wife.
 - * **Drake McMillan**, 46, who was last seen diving from a boat in August 2001.
 - * **Phillip Shepherd**, 26, who disappeared with two companions in a boating accident in September 1995.
 - * **Daniel Maycock**, 19, who disappeared in the 1995 accident.
- Still missing is Austin Lloyd, 19, who disappeared in the 1995 accident.

able to be recovered. This was instant confirmation that this was the site of the 1995 boat crash. The second body was then recovered via the ROV in a similar manner. Although both bodies were partially skeletons, the intact clothing caused them to remain relatively intact. I would like to stress that it is a tribute to the skill and patience of the ROV operator in both these cases, or the bodies would certainly have broken apart. The third victim of this crash was not found near the boat and remains unaccounted for.

Finally, on 17 November, the bodies of the young couple were located by the side-scan sonar and recovered via the ROV. Their images on the computer screen were not nearly so human-like as the previous three bodies.

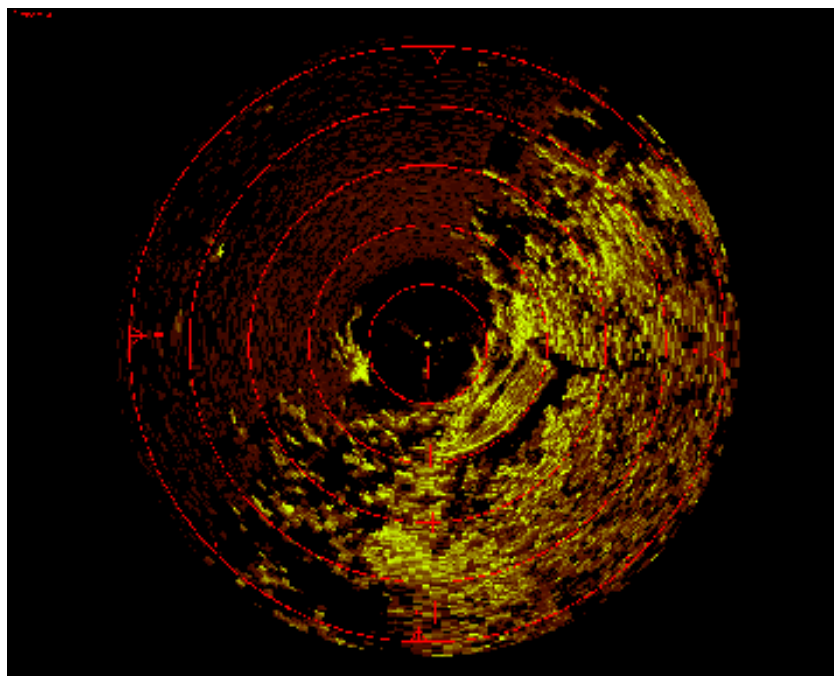
Nonetheless, their recovery via ROV was simple, as their clothing was bulky and easy to grasp, there was no decomposition, and the bottom was free of debris.

Some tremendously valuable lessons were learned from this incident. When side-scan, sector-scan, ROV, and diver technologies are employed in collaboration; a most efficient search and recovery

operation can be conducted. Over 12.5 square miles of lake bottom were searched during this deployment. It is very, very beneficial to have an ROV with a manipulator arm to make a recovery, especially in deep-dark-frigid water.

In situations where trees or debris block the ROV's access, divers are the answer. In cases where the body is likely to break apart, divers are the answer. If no manipulator arm is available, divers are the answer. If criminal behavior is suspected, divers are clearly the answer. In most types of recoveries, divers are necessary to facilitate a proper recovery. In fact, during the Strawberry Reservoir deployment the ROV got tangled up in a rope attached to the submerged boat. Divers were gearing up to go down and free it, when it broke free of the entanglement.

Lastly, when an ROV has no manipulator arm or if debris is present, a diver guided via voice-comms to a target via a Sector-Scan Sonar unit it is one of the most efficient practices one can imagine. The diver may be guided to items as small as handguns. This is recognized in the graphic when you realize the slats in the floorboard of the submerged boat are



easily recognized.

Finally, the overall objective of this article is to present issues relating to these technologies being used to complement each other. The deployment itself was quite fantastic, but the strategy was only successful because of the willingness and inspiration to use all the available technologies to enhance one another.

Further questions or comments may be

directed via email to Sgt. Wendell Nope at wnope@utah.gov.

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