

08-17-2000 Denver CO - Robert Crump - FF-Flood -Trapped in Culvert



<https://www.firehero.org/fallen-firefighter/robert-w-crump>

Robert W. Crump

- Firefighter
- Denver Fire Department
- Colorado
- Age: 37
- Year of Death: 2000

Robert W. Crump, 37, a career firefighter with the Denver Fire Department, drowned while trying to rescue a woman from a flash flood on August 17, 2000. Crump was a Marine Corps veteran.



Denver Firefighter Swept Away by High Water During Rescue - Five-Hour Search Ends Tragically

<http://fallenbrothers.com/community/showthread.php?2603-Denver-Firefighter-Swept-Away-by-High-Water-During-Rescue>

08-17-2000 DAVE J. IANNONE Firehouse.Com News

An exhaustive five-hour search ended late Thursday night when the body of a Denver firefighter swept away by high water while helping save a stranded motorist was found in a drainage culvert.

Robert Crump, 37, and a second firefighter from Squirt 10 of the Denver Fire Department were directing traffic around high water on Colorado Blvd. when a woman left her flooding car and slipped in the fast-moving current while walking toward the side of the road, officials said.

"Two firefighters went in and grabbed the woman, but [Crump] slipped and the current caught him, carrying him under," said Mark Watson, public information officer for the Denver Fire Department.

Crump was last seen at about 5:45 p.m Mountain time. Some of his gear, including his helmet, was recovered during the search and crews held out hope that he would be found alive until the end, Watson told Firehouse.Com News late Thursday.

"Given the option between their life and somebody else's life, they (firefighters) would take great measures to make sure the other person would live first," Fire Chief Rich Gonzales told the Associated Press.

Crump's body was found at about 11 p.m. about two-and-a-half blocks away after the extensive search by more than 50 firefighters and dozens of law enforcement personnel and officials from other agencies.

Water levels in the drainage culvert rose to as high as 14-feet, according to Watson, and had subsided somewhat when crews found Crump's body. Searchers also looked in storm drains and man hole covers during the operation.

Watson said firefighters were not engaged in an active operation when the woman left her car, and thus were not wearing lifelines when the two men quickly reacted and went into the water to save the woman from being carried away by the swift-moving water. No one was able to get to Crump in time after he went under, Watson said.

The second firefighter and the woman were not injured.

Crump leaves behind a wife and three children, daughters ages 9, 11 and 13. He joined the department in April of 1997.

"Naturally, you can imagine how the fire department feels -- any time you lose a member, it's a loss to the whole department," Watson said. "They (at station 10) are feeling the brunt of it right now. They've taken themselves out of service until they're ready to continue."

The funeral will take place Tuesday at 11 a.m. at the Church of the Nazarene on Hampden Blvd. and Colorado Blvd. in Denver. A reception will follow at the Colorado Convention Center. For more information call (303) 458-6129.

The Bob Crump Memorial Fund is set up at:

The Denver Fire Department Credit Union
2201 Federal Blvd.
Denver, Col. 80211
(303) 458-6129

The last Denver firefighter to be killed in the line of duty was in 1993 when Firefighter Douglas Konecny was shot while entering an apartment of a suicidal man. In 1992, Firefighter Mark Langvardt was killed while battling an arson fire.

Denver firefighter dies in flood after saving trapped woman

<http://www.deseretnews.com/article/777899/Denver-firefighter-dies-in-flood-after-saving-trapped-woman.html?pg=all>

Aug. 18, 2000 **Associated Press**

DENVER — A city firefighter died when he was swept away by floodwaters while rescuing motorists stranded after a torrential downpour.

Robert Crump, 37, disappeared at about 5:45 p.m. Thursday after he and a second firefighter rescued a woman whose car had stalled in high water. His body was recovered at about 11 p.m., said Mark Watson, a spokesman for the Denver Fire Department.

Both firefighters were caught in a whirlpool. The second firefighter escaped, but Crump was sucked into a culvert, officials said.

"Given the option between their life and somebody else's life, they (firefighters) would take great measures to make sure the other person would live first," Fire Chief Rich Gonzales said.

The firefighters had been searching for passengers in flood-stalled cars at an intersection when they were swept away, Watson said.

Crump, a firefighter since 1997, is survived by a wife and three daughters, ages 9, 11 and 13.

The storm swept into the Denver area after 3 p.m. and dropped 1.57 inches of rain in Denver and 2.64 inches in Commerce City and disrupted power to nearly 24,000 people. Power was restored to all but about 6,000 customers by about 9 p.m. The storm caused 20- to 30-minute flight delays at Denver International Airport but no cancellations were reported, airport spokesman Dan Melfi said.

Lost firefighter called 'angel in blue'

<http://extras.denverpost.com/news/news0819c.htm>

Aug. 19 2000 By Andrew Guy Jr. and Marilyn Robinson Denver Post Staff Writers

-When Christopher Crump heard that his big brother had died in raging roadside floodwaters trying to save a life, he wasn't surprised.

"Oh man, when I heard about it, it sounded just like Bobby," said Christopher Crump, of Palmdale, Calif. "He would do anything to help anybody. And sometimes he helped people when they didn't need it." Robert Crump's impact on people was more than that of a faithful civil servant, friends, family and colleagues said Friday.

SERVICES

Robert Crump's funeral will be held at 11 a.m. Tuesday at Denver First Church of the Nazarene, 3800 E. Hampden Ave., Englewood.



From there, a procession will travel past Crump's fire station at Martin Luther King Boulevard and Steele Street en route to Fairmount Cemetery at 430 S. Quebec St.

A reception will follow at the Colorado Convention Center, 700 E. 14th Ave.

RTD will provide shuttle service from Mile High Stadium to the reception.

Donations to the family should be sent to Denver Fire Department Federal Credit Union, 2201 Federal Blvd., Denver, CO 80211. Make checks out to Robert Crump Memorial Fund. For more information, call 303-458-6129.

At radio station KRFX-103.5 FM, disc jockeys Lewis and Floorwax raised nearly \$35,000 Friday and paid for airline tickets to fly Crump's parents in from out of town, said program director Garner Goin.

Crump, they said, was an artist who became a firefighter with a second job as a carpenter so his wife could stay home with their three daughters.

"I have a drawing of Jesus hanging in my house that Bob did when he was in his early 20s," Christopher Crump said. "He was a talented artist, and he originally wanted to be an artist, but he decided to become a firefighter because he wanted to help people."

Robert Crump's widow, through a fire department spokeswoman, said he was a devoted family man.

"I feel so cheated because we had our future planned," Desiree Crump said. "He was really a dreamer, a Renaissance man. He was multitalented. He could read something in a book and do it. People were amazed. He could do anything."

He was finishing the basement for a Labor Day visit from his parents, she said.

The couple had three daughters - Jessica, 13, Kaitlyn, 9 and Hailey, who is turning 12 on Sunday.

Crump, 37, was swept away in a torrential rainstorm Thursday evening as he went to the aid of a stranded motorist and a fellow firefighter who had slipped into the water.

"Bob gave the ultimate sacrifice and gave his life to save another," said technician Gil Lettig, a fire academy classmate of Crump. "He's a hero."

Crump joined the Denver Fire Department on April 1, 1997, after serving seven years in the Marines and working as a carpenter.

A native of Waukegan, Ill., he graduated from Willow Brook High School in Villa Park, Ill., in 1982.

He and his wife met in 1984 in California when he was in the Marines, she said. She said they knew on their first date they were meant for each other.

He recently moved his family to a larger home in east Aurora. The family planned to spend the rest of their lives at the home, Desiree Crump said.

Lettig said he and Crump discovered a bond while they were in the Denver fire academy - both had three daughters and no sons. "We would joke about it," Lettig said.

Lettig described Crump as coolheaded. "I can't remember Bob ever being flustered," he said.

They often studied together, but they never discussed the dangers of the job, Lettig said.

"If you dwell on it too much, maybe you don't belong in this profession," he said.

Lettig said firefighters are sometimes called "angels in blue." Crump, he said, showed why. "Bob Crump was the ultimate hero, the ultimate firefighter."

Crump grew up in Villa Park, Ill., where, his brother said, he was that one person everybody wanted to be around.

"He was outgoing in sports," Christopher Crump said. "He was very active, he had a lot of friends and he was always happy and helping people out."

In addition to his wife, children and brother Christopher, Crump is survived by his parents, Anthony and Susan Addimando of Carol Stream, Ill.; another brother,

KILLED IN ACTION

Robert Crump becomes the 52nd Denver firefighter to die in the line of duty since 1881.

Two died in the early 1990s.

Douglas Konecny was shot to death Jan. 31, 1993, by a suicidal man as he climbed a ladder to open a second-floor window at the man's northeast Denver home. Lamar Edwards held police at bay before setting the house on fire, then shooting and killing himself.

Mark Langvardt was killed Sept. 28, 1992, while fighting an arson fire in a business on South Broadway. Jody Aguirre was sentenced to life in prison without parole for masterminding the arson. Also killed in the line of duty earlier in the history of the Denver Fire Department were:

1886: James Lloyd

1891: Horace Knight

1893: Fred Pierrepont and Frank Mahoney

1895: Harold W. Hartwell, Frederick Brawley, Richard Dainridge and Steve Martin

1897: Lee Bottom

1899: Harry Robinson

1904: Charles Dollof, John McGlade, Frank Lunt and Charles Eymann

1908: Robert Geddes

1910: Vinson Davison

1916: Harry Cox

1928: Thomas Hyder, William Barber, Silas Briggs and Richard Schwairy

1931: Elmore Palmer

1932: James Moses

1934: Curtis Dendinger, Colin Taylor and Andrew Mahon

1936: John Reisbeck, William Feely and Edward Carlson

1938: James Simpson, George Brooks, Ralph Johnston and Henry Miller

1940: Elmer Hair

1941: Stephen Keating

1943: James Williams, Douglas Parrish and John Kennedy

1944: William Briggs and Robert Parker

1952: Leonard Shire and Fred Erb

1955: Chester Block

1958: Charles McCadden

1960: Joseph Hotchkiss and Robert Parrahm

1967: Victor Sullivan

1968: John Keller

1971: Wayne Manaugh`

Brian Crump of Rochelle, Ill.; and two sisters, Dorothy Graham of Wheaton, Ill., and Janet Sheehan of Creston, Ill.

Firefighter's drowning prompts safety review

<http://extras.denverpost.com/news/news0826f.htm>

August 26, 2000 By Kevin Simpson Denver Post Staff Writer

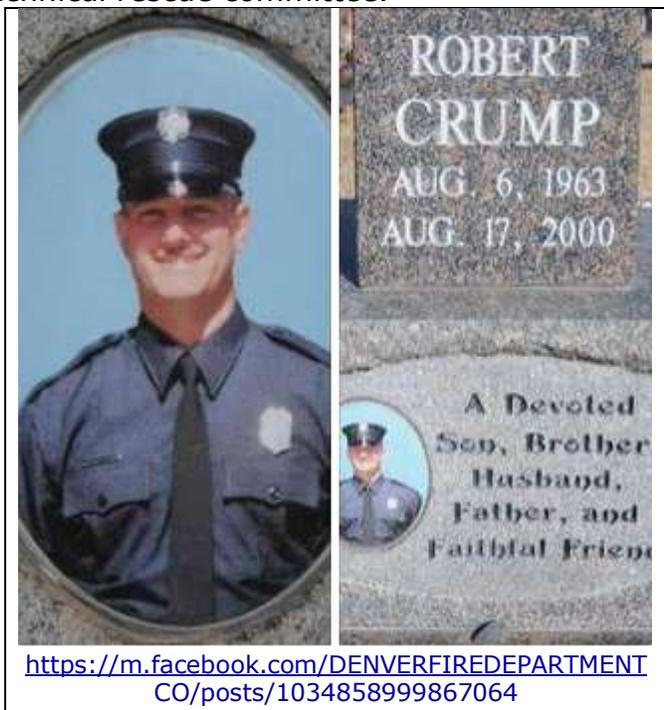
Water rescue experts nationwide contend that no amount of training or equipment could have saved Denver firefighter Robert Crump, whose spontaneous attempt to rescue a woman in swirling floodwaters cost him his life.

"I don't think it's possible to prepare for an improvised rescue," says Don Cooper, deputy chief of the Cuyahoga Falls, Ohio, Fire Department and secretary of the National Fire Protection Association's technical rescue committee.

Although that assessment was echoed by other authorities, the Denver Fire Department will examine the circumstances of Crump's death and try to learn from it.

"I think everyone on the job will look at flash floods differently, look at storm drains in a different light," says Randy Atkinson, a spokesman for the Denver Fire Department and also president of the Colorado Professional Fire Fighters.

"As a program, we'll wait and then huddle to look at the whole picture. We need to let our emotions calm down."



Paul Cooke, director of the Colorado Division of Fire Safety, says Crump's death has called attention to the hazards of flash floods and prompted "significant talk" among fire chiefs about safety practices.

"I think the curriculum, the training that's out there is adequate," Cooke says. "I think what you'll see is departments re-emphasize policies and standard operating procedures, whatever they are."

Ron Moeder, a Denver training chief, says the training division is compiling ideas about what could be done in the future, but he doesn't believe training was an issue in Crump's death.

"It was a freak accident," Moeder says. "I can't say we'll never see circumstances like that again, with the weather like this in Colorado, but we'll all remember this

and take a different approach. What that might be, I can't tell you." The National Institute for Occupational Safety and Health, a federal agency based in Morgantown, W.Va., investigates all on-the-job firefighter deaths, and will look into the Denver incident sometime next month, according to a spokesman.

On Aug. 17, the 37-year-old Crump and fellow firefighter Will Roberts were directing traffic during a flash flood at East 50th Avenue and Colorado Boulevard when they saw Loretta Martinez stranded and clinging to a metal post.

The two waded into the intersection to retrieve the 45-year-old woman, but Crump was pulled under by the swirling waters of a 12-foot-deep culvert. Roberts guided Martinez to safety and then, with a cable tied around his waist, tried in vain to locate his partner.

Crump's body was found six hours later in a drainage ditch two blocks away.

"When you see somebody out there, by nature you have an inherent feeling that you have the duty to respond," says Scott Frazier, commander of the Los Angeles Fire Department's urban search and rescue unit. "When you see somebody in trouble, it becomes your moral obligation to do something. I can't fault them.

"I applaud them." Cooper emphasizes that Crump's venture into the floodwaters with his partner should not be judged as a classic "water rescue" operation. Both firefighters were sent to the scene not to perform a rescue, but to manage traffic. He likens the situation to a police officer who happens to be dining in a restaurant when someone attempts to rob the place.

"He improvises, assesses the situation and does what's necessary," Cooper says. "There's no training, no equipment to prepare for swirling water in a culvert that I'm aware of. The training I'm aware of suggests to avoid those environments."

John Kushner says Denver firefighters are better trained than most departments when it comes to water rescue. He's the director of education for Dive Rescue International, a Fort Collins-based company that counts the Denver Fire Department among its clients.

The culvert that claimed Crump's life was not a "normal hazard," Kushner says. He adds that fire department preparedness may need to be augmented by other city agencies identifying and mapping dangerous areas.

"It requires a multifaceted response to identify potential hazards like these," he says. "What do you do? You look at past history, areas of the city that may be flooded during flash floods or rainstorms. You have to look at those areas and say, 'If we have to get somebody from that area, is there life-threatening potential for a public safety person?' "You can bet that'll be done with a much wider perspective now with regard to open drains."

Less than a month before Crump's death, local business people had complained to the city about drainage problems and flooding near the site. They were told that the wastewater system for that area wasn't due for overhaul for another three years.

Two days after the tragedy, Denver Mayor Wellington Webb ordered a grate placed over the 4-foot-diameter drainage pipe that swallowed the firefighter.

After the Aug. 17 incident, some observers raised questions about the "turnout gear" that both Crump and Roberts wore at the time of the rescue effort. The coat and leather boots, plus helmet and gloves, are not standard water rescue equipment - but then, Crump and Roberts hadn't been summoned on a rescue call.

They simply reacted on a moment's notice.

"Turnout gear and water don't mix," says Ron Jamison of the Phoenix Fire Department's special operations team, which often deals with flash-flood situations.

"When you get into water with dry turnouts, they're buoyant and they float, and will almost lift you off your feet. But they won't stay buoyant long, and soon they soak up water like a sponge and get very heavy."

Standard fire helmets are also a hazard in the water, he says, because they're designed to shed water, and could work like an anchor once immersed.

But while those lessons may be reinforced among firefighters for future reference, experts are quick to add that Crump's gear probably didn't figure in his death.

"In this particular case, I don't care what you're wearing, it wouldn't have saved you," says Dive Rescue International's Kushner. "This wasn't on Cherry Creek or the South Platte. It was an intersection. Knowing what I know about suction and culverts, it doesn't matter how buoyant you are, the water is stronger than the buoyancy."

Denver fire spokesman Atkinson notes that when a diver clad in a wet suit and life vest was lowered into the culvert on a harness, the force of the water almost pulled three land-based handlers in with him.

Jamison of the Phoenix Fire Department says that while his city has no flowing water such as rivers or streams, flash flooding poses a constant threat.

"Our intent is to stay out of the water, especially in flash-floodwater, because it's basically mud, you can't see 2 inches into it," he explains. "You can't identify hazards."

Jamison says Phoenix firefighters are responsible for surveying potential flash-flood areas and identifying as many hazards as they can. But he adds that sometimes, circumstances require spontaneous action.

"Firefighters are paid to save people," he says. "We've had them enter water and complete saves, just because they saw a person float by and had to go get them. We've been lucky; we haven't lost anybody that way."

Robert Wayne Crump

<https://apps.usfa.fema.gov/firefighter-fatalities/fatalityData/detail?fatalityId=741>

Firefighter Crump and members of his squirt company were directing traffic away from an area that had been flooded by a very heavy rain. Firefighter Crump was wearing full structural protective clothing including a protective coat, protective trousers, and a helmet. According to the police report, 2½ inches of rain had fallen in the 2 hours prior to this incident. As the firefighters were working, a woman who was attempting to cross a flooded area stalled her car in the high water and was attempting to walk to a nearby bank to make a phone call. She attempted to cross a rain-filled ditch and fell into the water. She became stuck in a pool of water that covered a culvert but was able to grab onto a pipe to prevent being drawn underwater.

Unbeknownst to anyone on the scene, the ditch led to a 64-inch concrete drainpipe that was not equipped with any type of grating. Firefighter Crump and another firefighter were summoned by the calls of citizens who saw the woman's predicament. Both firefighters entered the water to rescue the woman. As they made their way to the woman, Firefighter Crump was immediately drawn under the water. Citizens assisted the other firefighter from the water, he returned to rescue the woman, and then turned his efforts toward attempting to locate Firefighter Crump. Approximately 5 hours later, Firefighter Crump's body was located by a police officer near an outlet of the stormwater system. His cause of death was listed as drowning.

Denver Fire Department 745 West Colfax Avenue Denver, Colorado 80204 Chief: Richard Gonzales
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A Fire Fighter Drowns After Attempting to Rescue a Civilian Stranded in Flood Water – Colorado

Death in the Line of Duty...A summary of a NIOSH fire fighter fatality investigation

F2001-02 Date Released: April 30, 2002

SUMMARY

On August 17, 2000, a 37-year-old male career fire fighter drowned while attempting to rescue a civilian stranded in flood waters. The career fire department

was notified of several cars that were stranded due to heavy amounts of rain and subsequent flooding. A crew was dispatched to the scene at approximately 1700 hours to assist motorists stranded by the flood waters. After the crew determined that there were no civilians in the cars, they waited until the police arrived to take over scene control. While two fire fighters (Fire Fighter #1 and the victim) were waiting for the police to arrive, they were verbally summoned by a civilian bystander to help a female civilian stranded in the water. The civilian was observed holding onto a pole in a pool of water that appeared to be about 3 feet deep. Due to the flooding conditions it was not obvious to the fire fighters that she was standing at the top edge of a culvert approximately 10 feet deep. Both of the fire fighters responded to the location of the female civilian and attempted a rescue. Fire Fighter #1 was the first to enter the water, and he was quickly pulled under by the undertow. The victim entered the water to aid Fire Fighter #1 to safety, then reentered the water to retrieve the civilian. While doing so, the victim was pulled under the water, into the culvert, and through a large-diameter pipe. For several hours, Fire Fighter #1 and other crews made numerous attempts to rescue and recover the victim. At approximately 2245 hours, the victim was found several blocks from the original location of the attempted rescue. He was pronounced dead at the scene.

The NIOSH investigators concluded that, to minimize the risk of similar occurrences, fire departments should

- **ensure that a proper scene size-up is conducted before performing any rescue operations, and applicable information is relayed to the officer in charge**
- **ensure that all rescue personnel are provided and wear appropriate personal protective equipment when operating at a water incident**
- **ensure that fire fighters who could potentially perform a water rescue are trained and utilize the "Reach, Throw, Row and Go" technique**
- **develop site surveys for existing water hazards**
- **ensure standard operating procedures (SOPs) are developed and utilized when water rescues are performed**

- **ensure that when using self-contained breathing apparatus (SCBAs), manufacturer's guidelines are followed**

Additionally,

- **municipalities should identify flood-related hazards and take steps to correct them as soon as possible in order to minimize potential for injury.**

INTRODUCTION

On August 17, 2000, a 37-year-old male career fire fighter died while attempting to rescue a civilian stranded in flood waters. On August 18, 2000, the U.S. Fire Administration notified the National Institute for Occupational Safety and Health (NIOSH) of this incident. On January 10-12, 2001, two NIOSH safety and occupational health specialists investigated this incident. A meeting was conducted with the fire department safety officers, a representative from the International Association of Fire Fighters (IAFF), and a representative from the city's Wastewater Management Division. Interviews were conducted with the Incident Commander, the Captain of the apparatus to which the victim was assigned, and other fire fighters involved in this incident. Copies of the police report, the department's standard operating procedures (SOPs), the victim's training records, the dispatch log, the department's investigative report, photos and maps of the incident site, and the death certificate were reviewed.

The career fire department involved in this incident serves a population of approximately 500,000 in a geographical area of 154.9 square miles and is comprised of 921 uniformed personnel who staff 31 fire stations.

On the day of the incident, weather conditions were cloudy with severe rain and thunderstorms. The site of the incident consisted of a 4-lane divided boulevard, a 5-foot diameter culvert which feeds into a drainage system, and an underground cement vault measuring 10 feet by 8 feet. A drainage pipe, laid under the boulevard, measures approximately 5 feet in diameter. The exposed, open south end of the pipe lies within a large drainage ditch into which it empties. The bottom of the pipe at the inlet was approximately 8 feet below the road surface. The inlet was not covered and was totally accessible. On the day of the incident, the flood

waters were approximately 10 feet deep at the inlet and were flowing in a northerly direction. With this amount of water, the pipe had a capacity of approximately 200 cubic feet per second and a velocity of approximately 15 feet per second. This drainage pipe was on a 6-year plan to be replaced with a larger capacity pipe and covered to prevent injury due to high flood water in that area. Work was expected to begin in year 2003. Since this incident, a junction box has been installed which covers the drain to the surface level.

Both the victim and fire fighter #1 were wearing fire fighter turnouts consisting of bunker pants, coat, boots, gloves, and a helmet. Neither the victim nor the assisting fire fighter had received water rescue training. The victim was certified through the State as fire fighter level II and had 3 years and 4 months' experience.

INVESTIGATION

On August 17, 2000, at approximately 1700 hours, Unit 10 was dispatched to assist stranded motorists in flood water. Responding on Unit 10 was a Captain, the Engine Operator, and Fire Fighters #1, #2, #3, and #4 (the victim). The engine operator positioned the apparatus approximately two blocks to the south of the flooded area and noticed that the street was filled with standing water (approximately 3 feet deep). Several stranded cars were stopped in the area.

The Captain sent the victim and fire fighter #1 to the north to check for any motorists in need of assistance. The two waded through approximately knee- to waist-high water for two blocks, checking in several cars that were floating in the water. After approximately 15 minutes on the scene, the victim called the Captain on his radio and reported that all of the civilian motorists had exited their cars. The Captain told the victim and Fire Fighter #1 to remain at the north end of the street to provide traffic control and inform drivers to use an alternative route until the police arrived on the scene. The victim positioned himself near the curb of the northbound lane and Fire Fighter #1 was standing near the median in the southbound lane, directing traffic.

A few minutes later, a civilian security guard at a bank across the street began yelling to the victim and Fire Fighter #1 that a female was stranded in the water and needed help. Neither the victim nor Fire Fighter #1 could see the stranded female, but they immediately began wading toward the security guard to

investigate. On the way to the other side of the street, the victim called the Captain on the radio to inform him that they had received notice that a civilian was stranded and that they were going to check further into the situation.

Fire Fighter #1, approximately 40 feet in front of the victim, approached the west side of the street and could see a female standing and holding onto a small metal pole (typically used for street signs) rising out of a pool of water. Fire Fighter #1 then entered the large pool of water to retrieve the civilian. Fire Fighter #1 stated that he believed the water was only 3 feet deep and that the civilian was standing on the ground. Therefore, he thought it was safe to enter the water. He was not aware that the civilian was standing on the edge of a large slope into the pool of water, which was approximately 10 feet deep. Fire Fighter #1 also stated that he did not see any visible current when he entered the water. As Fire Fighter #1 approached the civilian, he began to go under the surface of the water. The victim approached the pool of water and saw Fire Fighter #1 going under the water due to the undertow. The victim reportedly handed his radio to a civilian bystander then entered the water to help Fire Fighter #1. The victim grabbed Fire Fighter #1, and they both struggled to the edge of the water. Fire Fighter #1, with his back to the water, climbed onto the bank, coughing from water he had swallowed. Before the victim reentered the water to assist the civilian, he told Fire Fighter #1 to radio for help. As Fire Fighter #1 turned around, the victim was gone and his helmet was circling on the surface of the water. Fire Fighter #1 removed his bunker coat and told the civilian witnesses to use the radio and call for help. Fire Fighter #1 stated that at this point he still did not realize there was a large-diameter pipe below the surface of the water. He thought he was being pulled under the water because his bunker coat and pants were weighing him down.

Fire Fighter #1 reentered the water and assisted the civilian to safety. Witnesses found a welding cable and tied it around Fire Fighter #1's waist. He reentered the water and began to frantically search for the victim under the surface of the water. At 1744 hours, a female civilian witness used the radio to call for help. The Captain, several hundred feet to the south of the scene, was confused about who was on the radio. Since his crew did not have any females on duty, he first thought it was a fire fighter on another scene.

During his search efforts, Fire Fighter #1 went under the water hoping to see the victim below the surface. After not locating the victim, Fire Fighter #1 exited the water and called on the radio for help, stating that a fire fighter was down. The Captain and Fire Fighter #3 then ran to the location. As they approached the pool of water from the south (see [Diagram](#)), they saw several bystanders forming a human chain and assisting Fire Fighter #1 in the water searching for the victim. Fire Fighter #1 stated that at this point he realized that there was a large culvert under the surface of the water and he was reaching into the culvert searching for the victim.

The Captain instructed Fire Fighter #2 to radio Central Dispatch for additional units and the underwater team. He then instructed all civilian bystanders to exit the water. At approximately 1755 hours, the following units were dispatched to the scene: District Chief #2; Rescue 11 (an underwater unit) with a Lieutenant, an Engine Operator, a safety diver, and a technician; Truck 9 with a fire fighter (acting Lieutenant), an Engine Operator, and three fire fighters; Pumper 9 with a Captain, Engine Operator and two fire fighters, and Pumper 1 (dive team) with a Lieutenant and two technicians. A representative from the city Waste Water Management Department was also called to the scene to provide maps of the underground drains.

When District Chief #2 arrived on the scene, he assumed Incident Command (IC). Fire Fighter #1 was continuing his search in the area where the victim went under the water. The IC was briefed by the Captain that the victim had been lost for approximately 10 minutes. The IC noted that the pool of water now had a large whirlpool effect. The IC requested Engine 9 to report to the scene.

At approximately 1805 hours, Engine 9 arrived with a Captain, Engine Operator, and two fire fighters. The Captain from Engine 9 informed the IC that he knew where the culvert exited and that he had old maps of the drain system. The maps were last updated in 1994; however, the drainage system had been modified since then. The IC directed him and his crew to search the location where the culvert ended.

During additional rescue attempts, the Engine Operator from Engine 9 used a self-contained breathing apparatus (SCBA) under water in the open culvert on the opposite side of the driveway to the bank to assist in finding the victim.

The IC instructed the Engine Operator from Truck 9 to don an SCBA, and he entered the area where the victim was last seen. He was tied off with a rope line, and he noted that the water was calm at the surface; however, approximately 5 feet below the surface, the force of the water started to pull him into the pipe. He signaled to the surface crew to pull him up.

At approximately this time, the dive team arrived. The IC briefed a safety diver from Rescue 11 about the conditions. The diver was equipped with a wet suit and self-contained underwater breathing apparatus (SCUBA), and was tied off around the waist with a rescue rope. The diver entered the pool of water by standing on the top edge of the culvert and noticed a small whirlpool at the surface of the water. He entered the culvert by grasping the interior ridges of the pipe; however, he retreated due to the strong current pulling him further into the culvert and pulling his mask from his face. The diver then exited the water.

The IC directed pumps to be used to pump out as much water as possible where the victim was pulled in. He then had crews cover the culvert with plywood to try to reduce the water flow. Once the water level was down approximately 6 inches from the top of the culvert, the safety diver from Rescue 11 directed light from his flashlight into the culvert. He could see into the culvert approximately 50 feet but did not see the victim. Crews continued searching the area for approximately 3 hours (see [Photo](#)). A crew at the north end of the scene found a strobe light flashing under the water. The crew then noticed the reflective tape from the victim's bunker coat approximately 1 foot below the surface of the water. At approximately 2245 hours, the crews called out that they had located the victim. The victim was removed by the police department and fire fighters. He was pronounced dead by the coroner and transported to the city morgue.

CAUSE OF DEATH

The death certificate listed the cause of death as apparent drowning.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fire fighters should ensure that a proper scene size-up is conducted before performing any rescue operations, and applicable information is relayed to the officer in charge. [1](#), [2](#)

Discussion: Fire fighters should conduct a complete scene size-up and relay the information to the officer in charge. Similar to a fireground incident, size-up information is imperative to ensure all information is considered, a risk-benefit analysis is conducted, protocols are followed, and hazards are identified and minimized. Typically scene size-up is the responsibility of the first arriving officer; however, fire fighters should also examine their surroundings to identify hazards as they approach the scene.

Recommendation #2: Fire departments should ensure that all rescue personnel are provided and wear appropriate personal protective equipment (PPE) when operating at a water incident.²

Discussion: All fire departments who are subject to water rescue should ensure that all rescuers are trained in water rescue and that they don proper PPE. This includes a water rescue helmet and an appropriate personal flotation device (PFD). Fire fighters should not be placed in a water rescue situation wearing standard fire fighter turnout clothing. Turnout clothing, when saturated with water can add a considerable amount of weight (approximately 60 pounds) to a fire fighters overall weight, making it very difficult to swim. Since this incident, the department has issued PFDs on every apparatus as well as alternative reflective gear to wear during inclement weather operations.

Recommendation #3: Fire departments should ensure that fire fighters who could potentially perform a water rescue are trained and utilize the "Reach, Throw, Row and Go" technique.

Discussion: In the event that trained designated dive rescue personnel are not available, fire fighters should be trained in the "Reach, Throw, Row and Go" rescue technique. Rescuers should attempt a rescue by extending a long-handled tool (e.g., pike pole), throwing a rope or flotation device with an attached rope to the victim, or by using a boat to gain access to the victim. Additionally, a pike pole

could be used to determine the water depth before the fire fighter walks into unknown waters. As a last resort, rescuers who are outfitted in proper PPE (i.e., clothing and a PFD) should attempt to swim to victims to bring them to safety. Fire fighters who respond to any potential water rescue situations should be properly trained to perform water rescues.

Recommendation #4: Fire departments should develop site surveys for existing water hazards.¹

Discussion: Site surveys for water hazards should include existing water hazards based on historical data. The survey should also include flood maps, and identify other site-specific hazards and specific PPE needed for each site. After a site survey is developed, all fire fighters should be trained on potentially dangerous areas which could result in a water rescue. Although the body of water where the victim drowned is not typically thought of as a hazardous site, the surrounding residents and the department had known the potential for flooding with very little rainfall. Since this incident, the department has identified all open culverts, sewers, or similar types of drains and has developed recommendations that are provided to various city fire stations and to the city public works division (i.e., grates, signs, etc.) to minimize the possibility of future incidents.

Recommendation #5: Fire departments should ensure standard operating procedures (SOPs) are developed and utilized when water rescues are performed.³

Discussion: In addition to other fireground operations, standard operating procedures (SOPs) pertaining to water rescues should be developed to standardize practices and techniques. SOPs should outline, at a minimum, the following: mandatory appropriate PPE; equipment or apparel likely to endanger personnel if they fall into the water or attempt a rescue; upstream safety spotters; personnel staged at downstream points; staging only properly trained personnel in the danger area; standard communications; waterway rescue preplans; and safety consideration for rescuers.

Recommendation #6: Fire departments should ensure that when using self-contained breathing apparatus (SCBAs), manufacturer's guidelines are followed.⁴

Discussion: Although there is no evidence that it contributed to this fatal event, Recommendation #6 is being provided as a reminder of good safety policy. SCBA manufacturer's precautions should be followed to ensure fire fighters' safety. In the manufacturer's operating and maintenance instructions it states that "the respirator is not to be used for purposes other than authorized by your respiratory protection program. For example, this respirator must not be used under water." There are a number of reasons for this statement. When an SCBA is used under water, the curved polycarbonate lens of the facepiece with water on one side and air on the other can cause significant distortion of the user's vision due to the refraction of the light as it passes from water to air. Additionally, because the pressure reducer of an SCBA is referenced to the ambient environment, there are passages connecting the interior portions of the pressure reducer to the surrounding atmosphere. This pressure reducer is generally optimized for the passage of gas and is intended to restrict the passage of dirt and/or liquid. With repeated immersion, water can collect in these passages and, without tear down of the pressure reducer for cleaning, can promote corrosion of the pressure reducer. In interviews conducted by NIOSH, two fire fighters stated that they had used their SCBAs under water before the underwater dive team's arrival to aid in the rescue attempts to find the victim. The crew that attempted rescue with their SCBAs had reportedly been told by the SCBA sales representative that the face piece would maintain a seal when submerged under water. The crew members then tested the face piece seal integrity in a swimming pool. As a result of their experience with the face piece maintaining a seal under water, they believed that they could successfully use an SCBA during an underwater rescue attempt. NIOSH strongly advocates following manufacturer's recommendations that SCBAs not be used under water.

Additionally, municipalities should consider the following:

Recommendation #7: Municipalities should identify flood-related hazards and take steps to correct them as soon as possible in order to minimize potential for injury.

Discussion: Before this incident, the city had received several complaints about the large amount of standing water and flooding in this area. The drainage pipe involved in this incident was originally installed in 1960 and measures 60 inches in diameter. It was on a 6-year plan to be replaced with a larger velocity pipe

(approximately 72 - 84 inches in diameter) and covered to prevent accidental injury during times of flooding. Work to replace this pipe was expected to begin in year 2003. Since this incident, a junction box and a trash grate have been installed to help prevent future injuries.

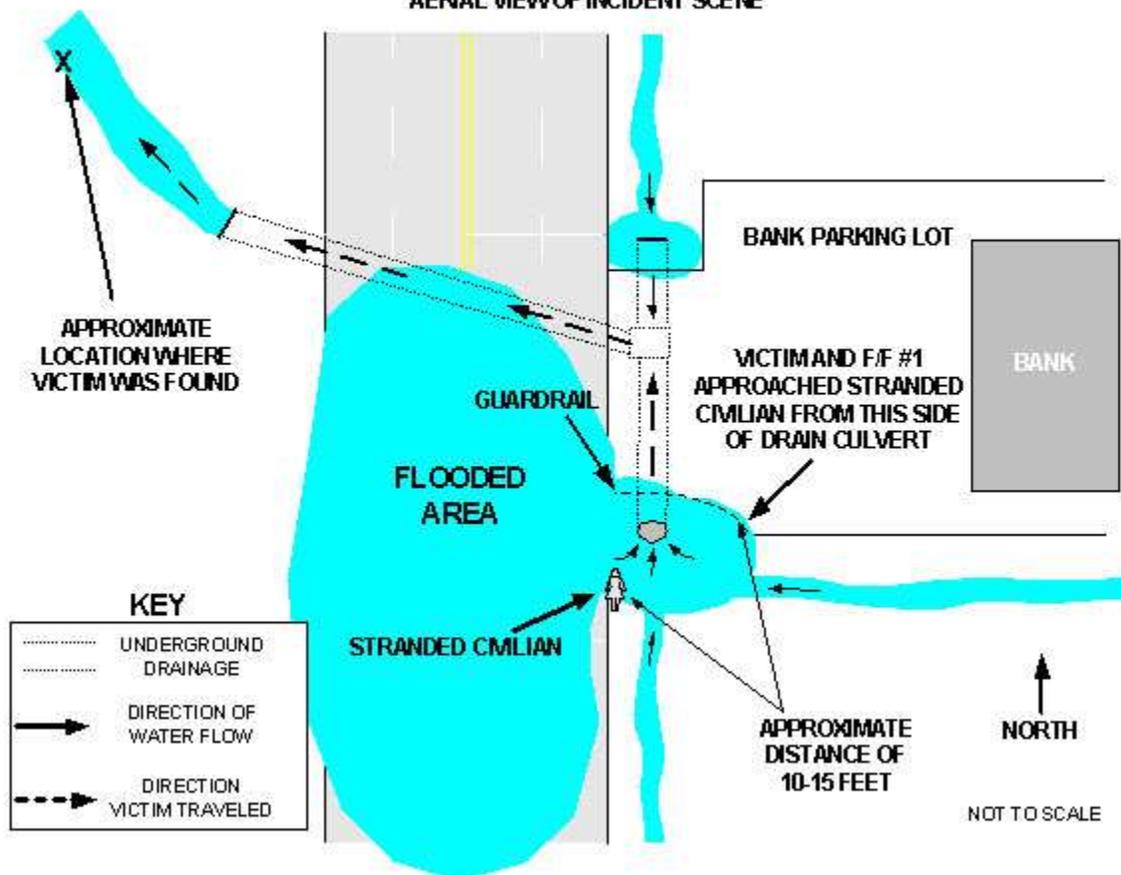
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INVESTIGATOR INFORMATION

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DIAGRAM
AERIAL VIEW OF INCIDENT SCENE





This page was last updated on 4/16/02

When the Rivers Rise

[HTTP://WWW.5280.COM/MAGAZINE/2011/04/WHEN-RIVERS-RISE](http://www.5280.com/magazine/2011/04/when-rivers-rise)

APRIL 2011 NATASHA GARDNER

As the Denver Fire Department's swift-water rescue teams gear up for another spring of snowmelt runoff, they're hoping for the best—and preparing for the worst.

The ground was already saturated from snowmelt on May 14, 2007, when an evening thunderstorm opened up over Denver, dumping more than an inch of rain in an hour. The clay-dense Colorado soil couldn't soak it up, so the water pooled, then flowed, then raged. Within minutes, I-25 was flooded. People stood on top of their cars in some parts of town to escape the water. A police officer nearly drowned attempting to rescue a civilian. A wheelchair-bound man was swept off the Cherry Creek Trail. And Elsha Guel was clinging to a concrete barrier as an inescapable current swirled around her. She'd been out for her evening walk along Lakewood Gulch, pushing her two-year-old son in his stroller. The creek, which had started out low that day, rose so quickly that it ripped the stroller—and her son—from her arms as she waited out the rain in a pedestrian tunnel. It would take two days to find the boy's partially buried body in the mud of the Platte River.

In spring, days like this are all too common. After a winter of powder in the high country, the snow melts and fills creek beds downstream. And Denver is definitely downstream. The slightest bit of rain or melt can turn a trickle into a river, a dry patch into a lake. Few people realize that slow-moving water, even just a few inches, can knock you off your feet. That one foot of water can float a car. That two feet—the depth of a bathtub—can turn a bus into a runaway boat. “The problem with swift water here is it’s easy to ignore,” says Craig Hilton, an 18-year veteran of the Denver Fire Department (DFD), which runs all local rescues. “It moves at just over one mile per hour. You can walk faster than that.” But swift water is unrelenting. “If [it] runs up against a wall, the force moves it around the structure,” Hilton says. “You can’t stop it.”



Every spring, the Platte River begins rising—its flow might double, or triple—all the way through June. When a 911 call comes into a fire station, a water rescue squad arrives at the scene within minutes. Working quickly, a few rescuers look for hazards and try to spot the victim. Other team members search the banks, strategize rescue options, and see where they might contain the victim downstream.

Most water rescues involve ropes and throw bags; rescuers want to avoid putting another body, another potential victim, into the water. Their protocol is, reach (using a hand or tool); throw (landing a throw bag near a victim); row (using a flotation device or boat); and finally, go (swimming to a victim). “Rescues are not pretty,” Hilton says. “You’re grabbing anything from clothing to a handful of hair.” Hilton has spent countless hours biking around Denver to identify urban water hazards; he’s even created a website, www.swiftwaterresponse.com, to catalog his finds. In an urban setting, Hilton says, a rescuer has to worry about hazards such as antiquated sewer drains that create whirlpools, broken dams, and flooded pedestrian trails.

Each year, the team trains for the unpredictable flash floods that plague Denver, all while hoping people will stay off the creekside bike paths and floodplains when the water is high, and that history won’t repeat itself. Yet it often does. Despite being a land-locked city, Denver’s past revolves around water-related disasters. In 1864, Cherry Creek flooded, which split the town in two, destroyed buildings, and killed 19 people. Thirty-two people died during a flood 22 years later. A 1965 flood damaged 600 homes and cost \$540 million. The Highland area originally emerged

after people began to settle there because, well, it was higher—and therefore safer—than the rest of the city.

Today, more than 2,000 Denverites live in a floodplain, an area that is low, prone to collecting water, or near a moving stream. (The Pepsi Center and Elyse Gardens both carry flood insurance because of their proximity to Cherry Creek and the Platte River.) And although dams—most notably Chatfield Dam in southwest Denver—hold back the most disastrous of floods, the structures are never totally reliable, because water can't be stopped, at least not completely.

One deadly example of swift water's impact happened on August 17, 2000. Firefighter Robert Crump and his partner were directing traffic near East 50th Avenue and Colorado Boulevard. An afternoon thunderstorm had flooded the busy roadway just before the evening commute. Crump wasn't dressed for water rescue, but the traffic control and flooded roadway were routine until he and his partner spotted Loretta Martinez clinging to a metal pole in a nearby ditch. Her car had stalled and she was trying to make her way to safety when the fast-moving water pulled her back. Crump went over to help her, but an underwater culvert (a pipe that carries water) created a funnel that sucked him below the roadway. His body was recovered hours later. The 37-year-old father of three was Denver's second firefighter to die on duty in two decades.

It was a difficult lesson for the department, one that still resonates. Hilton wasn't working that night, but he visited the scene after the accident: "I crawled into the culvert that he died in," Hilton says. "I never want another person to go through that." He can't help but wonder if the outcome would've been different had Crump been trained in urban water rescue and thus had recognized the danger the culvert presented.

Since Crump's death, Hilton has worked with the department's squad of specially trained water rescuers. He was the first certified swift-water rescue instructor; now there are three. He cites everyday conditions that seem harmless but that could contribute to more casualties: After Crump died, the city placed a grate over the 50th Avenue culvert, but Hilton says this could snare a victim like hair in a shower drain. The gondola locks on Cherry Creek—used to lift boats down the waterway in the summer months—fill up during a flood and act like a vault that could trap a person. And the dams on Cherry Creek have tines that, during a flood, sit just inches below the surface and can snag clothing.

The bigger problem may be the economy, which has drained the DFD's training funds, so on any given day, about one-third of on-duty firefighters won't be trained in water rescue. "We want every firefighter to be able to look at a body of water and know how it's going to act," DFD captain Greg Bixley says. "But things are strapped so tightly, we are probably going to suspend the [training] program for a year." The squad is watching this year's massive mountain storms and bracing for the worst. After all, the worst has happened before, and it probably will again. "The snowpack is up over 100 percent," Hilton says. "Depending on how quick it melts, it could be an interesting spring."