MERIDIAN
Fall 2017
The Quarterly Publication of the Mountain Rescue Association
mra.org

MedCom: Backcountry Trauma

Caving and Mountain Medicine Book Reviews
Spring Conference and 2017 Stats

MOUNTAIN RESCUE ASSOCIATION

Fall 2017

Cover caption: Aerial view of Mt. Hood during an aerial search for missing hiker (found alive!). Todd Lemein

MRA Leadership

Support those who support the MRA!

To learn more about our levels of sponsorship, click through to the MRA Sponsor page.

President's Message Fall 2017

By Bryan Enberg, MRA president and New Jersey Search and Rescue

Greetings Rescuers,

Winter is my absolute favorite time of the year! My winter SAR gear has been loaded in the truck now for nearly a month and the snow has already been falling regularly here in the northeast. Christmas decorations are going up, and the cookies are flowing into the office. Hopefully, I can figure out a way to sneak in a few peak bagging trips with Jen and Josh between what seems to be an ever increasing SAR mission load.

Winter Meeting

'Tis the season and preparations are in full swing for the MRA Winter meeting, February 2-4, 2018. Thanks to Kayley's strong work we will be back at the Holiday Inn, South Jordan Utah. Early Bird Registration ends December 31st so register now before rates go up!

There will be a welcome dinner reception on Friday at 6:30 pm. On Saturday, breakfast will be served in the meeting room starting at 7:30 am with the meeting starting at 9:00 am. In this session we plan to report on MRA strategic planning projects, discuss the proposed budget, as well as hold training sessions on the new MRA List Service and Discussion Boards system and some exciting new features that are being offered in our ESRI Mission Reporting and Mapping systems. Lunch will be served in the meeting room during which time we will hold a region chairs meeting. Hospitality will be in the meeting room at 6:30 pm. Sunday Breakfast will be held in the meeting room at 7:30 am, and the business meeting will commence at 8:30 am with a targeted close of 2:00 pm for those who need to catch a flight home.

If you have items that you wish to be discussed at this meeting, please send them to me so they can be added to the agenda. A live link to the working agenda document will be sent to the admin lister shortly.

Please make sure your team sends a representative to this meeting as this meeting is critical to the operations of your MRA and ensures that you and your team are up to speed on all the workings of this organization.

Lister Service

After a few technical hiccups, we are in the final stages of work on the new MRA Lister and Discussion board service. While this has taken far longer than anticipated, this is something that we wanted to do right once. This new service will not only offer the membership communications capability that we all miss, but it will also offer tools for file sharing, a contact directory, project management including task and assignment lists, group calendars and an announcement app, all of which will be phased in, incrementally.

Upcoming events

Mark your calendars!

MRA CON2018, June 8-9, 2018 hosted by Rocky Mountain House Volunteer Search and Rescue in beautiful Nordegg, Alberta

June 2019, TBD - Portland Mountain Rescue

June 2020, TBD - Allegheny Mountain Rescue Group

June 2021, TBD - Larimer County Search and Rescue

If your team is looking to host an MRA Conference, please reach out! We are looking for a team who will be interested in stepping up for 2022.

MRA Mission Reporting

Thank you to all the teams who are regularly posting their mission statistics to the MRA Mission Map. http://mra.org/mramissions-to-date-2017/ This is a fantastic tool which not only helps the MRA show the value the teams of the MRA provide on a national level but can be used in your teams marketing efforts. At the time of this writing, there are 1048 mission reports (not counting the one random mission in the south pacific.)

The Face of the MRA

If you or your team is doing something, we want to share it! Post it on our Facebook page or send us an article! Have a member of your team to be highlighted? Send us a name, and we will do the interview! Are you using a cool new tactic or testing with a new piece of gear? Let us know! Have an epic mountain rescue photo? Send it our way! We want the Meridian to tell the story of your MRA!

I hope you enjoy this edition of the Meridian, yet another great benefit of MRA membership.

Thank you, all, for your hard work, courage, commitment, and compassion.

A joyous Christmas and happy holidays to all!

Bryan, Jennifer and Joshua Enberg

Bryan Enberg

President, Mountain Rescue Association

president@mra.org

Phone/Text 973-459-0635

Major Trauma in the Backcountry

Cassie Lowry Edmark, W-EMT, MS III

Trips, falls, glissading gone wrong… Field treatment of major trauma is generally uncomplicated, the underlying principle is stabilization, and whatever you do, don't make it worse.

Essential in major trauma is the mechanism of injury. Was their 500-foot slide down the glacier halted by a gentle snowy run-out or a pile of boulders? Did they take a 30-foot whipper and hit things on the way down? Did a plume of debris crash down on top of them? A recent study of rock climbers treated in American Emergency Departments found that they were 10 times more likely to be admitted to the hospital for complications if they had fallen from 20 feet or higher. Bottom line - mind the mechanism. It will guide you and your patient assessment. Injuries that kill people are not always obvious.

Take, for instance, a rock climber falling on lead, inverting, and hit the wall sideways. He was initially dazed, but did not lose consciousness and was wearing a helmet. He complained that his side and hip hurt. Just looking at him, there's no blood and no broken limbs. There is minor bruising on his hip but he can walk and looks pretty normal. He continues to belay his partner but eventually complains about difficulty breathing. After some time he's taking rapid, shallow breaths, his chest is rising asymmetrically, he's progressively more confused and agitated, and on exam he has point tenderness on the side of his ribcage. More time passes, he's pale, cool to the touch, unresponsive, and his pulses have gotten weak.

On impact this climber broke ribs which led to an air leak inside the chest. As sometimes happens, this leak caused his lung to collapse and compromised his ability to breathe. The collapsed lung caused pressure imbalance that impairs circulation through the heart and the major vessels inside the chest cavity, compromising circulation for his entire body. This is called a tension pneumothorax. Without advanced medical intervention, this kind of trauma will lead to shock, cardiac arrest, and ultimately death.

Major trauma is defined as an individual injury or accumulation of injuries due to external forces that act physically against the body with poor survivability. Injuries due to blunt (aka non-penetrating) trauma are statistically the most lethal. Other than a tension pneumothorax, examples are torn major blood vessels, accumulation of air in the chest cavity, lacerations of the spleen or liver, cervical spinal cord injury, and brain bleeds. Penetrating injuries may also be present and are usually more attention-getting, but alone are not responsible for as many deaths in trauma cases as blunt trauma injuries.

Looking beyond the intricacies of deranged anatomy and haywire physiology, the assessment of a major trauma boils down to the ABCs of airway, breathing, and circulation. Make sure there is a patent airway - chest rise shows that he's breathing, and so does talking. Assess the presence, quality, and rate of his breathing and chest expansion. Is he gasping, is he wheezing? Does he have proper circulation or is he losing too much blood to maintain that circulation? Assess the presence, quality, and rate of his pulse. Pay attention to the color and feel of his skin. Monitor his level of consciousness. Notice if any of these things are changing. Closely monitor vital signs and mental status. If possible, identify, treat, and communicate the suspected source(s) of shock but do not delay transport.

The main concern in major trauma is shock. Shock is the result of reduced circulation and impaired oxygenation of tissue. Fundamental pre-hospital shock management includes:

1. Preventing further blood loss (if possible).
2. Supplemental oxygen (if available).

3. Keeping the patient horizontal, but elevating the head and not the legs if you think there is a head injury.

4. Insulation and active rewarming to prevent hypothermia.

5. Rapid initiation of Advanced Life Support and transport to definitive care.

All shock leads to cardiac arrest if uncorrected, so the clock is ticking. Even with successful resuscitation, end-organ failure and death will still follow if the cause of shock is not corrected (e.g. the source of major bleeding repaired or removal of the excess air inside the chest cavity). This usually requires some degree of surgery. Thus, CPR in the field for major trauma is likely to be futile if the inciting injury or injuries are not corrected. Each team has its own protocol regarding CPR and termination of resuscitation in traumatic arrest cases, however the reality of traumatic arrest when definitive care is not immediately accessible remains the same.

Final thoughts

The management of major trauma is a complex topic that intertwines physiology, evidence-based medicine, policy, and procedure. Just like medicine, mountain rescue is always evolving and striving toward improvement. The MRA Medical Committee serves as a resource for mountain rescue teams. We welcome your thoughts and questions, and encourage your development. Please reach out to us by emailing Christopher van Tilburg MD, MRA MedCom Chair, at vantilburg@gorge.net.

Spring Conference Scholarship Program

Antonio M. Arizo, Ventura County East Valley SAR

As with any organization there are always a core group of members who help manage the organization and keep it going. The Mountain Rescue Association is no exception. As the MRA "greyhairs" who have been managing the association start moving on, there is a need for fresh blood and new ideas. In order to get more team members involved the MRA established the Spring Conference Scholarship Program. The annual MRA spring conference is a great opportunity for members of an MRA team to see new techniques and interact with rescuers from throughout the U.S. and the world. At the business meeting members can see how the MRA is managed, represent their team in decisions that may affect them, and even offer to contribute to the MRA by volunteering on one of the many committees.

The spring conferences are held throughout North America from Anchorage and Vermont to the MRA birth place on Mt. Hood. There are at least two days of classroom and field sessions. Most conferences include pre-conference activities and specialized training. Some of the past pre-conferences have included three-days on a glacier, canyoneering, aircraft rescue, and local peak climbs. The conference is topped off with a banquet, award ceremony, and a guest speaker from the mountaineering community. The conference concludes with the MRA business meeting where actions are taken that affect all the member teams.

To view photos from some the recent conferences, go to https://www.flickr.com/photos/crmra/collections/72157685649803931/.

The cost to attend the conferences are reasonable. The venues are generally modest locations. Generally, travel is the biggest expense for conference attendees. Three years ago, the MRA developed the Spring Conference Scholarship program to support up-and-coming team members by helping to defray some of the costs. The scholarship recipients attend the conference, and when they return home, share their experiences and newly acquired knowledge with their team. By attending the business meeting the recipient may want to get more involved in the MRA at the region or national level. They may have a specialized skill that they can offer to the MRA.

The MRA budgets funds for the program and allocates an amount for each of the eight regions based on the number of regular and associate teams in the region. East region manages the application and selection process for awarding of the scholarships including the amount per recipient.

The region establishes the specific requirements for the scholarship. The general guidelines for the scholarships are:

1. Been a member of an MRA team for at least 2 years.
2. Have not previously attended a spring conference.
3. Be recommended by the team/unit leader.
4. Write a short essay.
5. Commit to attend the business meeting.

Over the 3 years there have been over 30 scholarship recipients. Several recipients have returned to attend subsequent conferences.

Roberto Crespo of Sierra Madre SAR giving a hand hauling during a rope rescue technique demonstration at the 2016 Conference in Port Angeles, WA. Antonio M. Arizo

A recipient from the Oregon Region "was really interested in networking." Another recipient from the California Region "learned several new techniques that I brought back to the team - the hands-on training was the most beneficial."

The 2018 MRA Spring Conference will be in Nordegg, Alberta, Canada on June 8 – 10, 2018. Advise you team/unit leader if you are interested in applying for the Conference Scholarship Program. If you are a team/unit leader, look around your team to see if you have a promising member that by attending the conference could benefit them and your team. Contact your region chair for information on your region's requirements and application process.

In time, it is hoped that many of the scholarship recipients will start taking leadership positions on their team, in their regions, and at the national level to fill in after the veteran team members have moved on after their many years of dedicated service to the MRA.

Watching a new technical rope rescue technique is a 2015 scholarship recipient, Kerrie Valdiviezo (right) of Santa Barbara SAR, who returned to attend the 2016 Conference in Port Angeles, WA. Antonio M. Arizo

Book Review: Mountain Medicine and Technical Rescue

Edited by George W Rodway, David C Weber & Scott E McIntosh

Reviewed by: Drew Hardesty, Utah Avalanche Center; Dr. Terry O'Connor

Drew Hardesty has been a forecaster at the Utah Avalanche Center for 20 years and a Jenny Lake climbing ranger in Grand Teton National Park for nearly that long. He received the Department of Interior Valor Award in 2012.

Dr.Terry O'Connor is a practicing emergency physician in Sun Valley Idaho, where he serves as the Sawtooth Regional EMS Director and sits on the State of Idaho EMS Physicians commission. He provides medical direction for ski patrol, helicopter ski operations and volunteers regularly for the Sawtooth National Forest Avalanche Center. As Adjunct Clinical Professor of Emergency Medicine University of Colorado, he contributes to the Consortium for Climate Change & Health and directs the Diploma in Mountain Medicine course for the Wilderness Medical Society.

For as long as people have been going into the mountains for solace, exploration, fame, or "because it's there," they have invariably become ill, injured, or worse… thus requiring help (if they were lucky) from their fellow man. This clearly posed problems for friends, family, first responders or "good Samaritans. Despite their spirit of beneficence and enthusiasm in heeding the call for help, rescuers lacking medical know-how and mountain savvy, step into this dynamic mountain arena with understandable trepidation.

Mountain rescue operations are inherently more complex than urban or "valley" medical or trauma incidents, thus requiring a whole pantheon of skills to *locate*, *access*, and then *transport* the ill or injured party. Conversely, alpinists and mountaineers may be able to safety locate, access, and transport an individual, but without skills to recognize illness or injury, *stabilize,* and adequately *treat* a patient, the rescue effort may quickly turn into a body recovery. For this reason, rescuers have turned to medical professional leaders for guidance and guidelines on best practices in the wilderness environment. The problem is many medical practitioners themselves lack the experiential knowledge to understand the mountain context. Some of the best intentioned recommendations are impractical, dangerous or even futile when put under the duress of high mountain winds, deep snow, and the sun ominously fading on the horizon. Furthermore, wilderness and mountain medicine is a nascent academic field with new evidence-based best practices replacing anecdote at an ever-accelerating rate. Putting it all together is no simple task.

Now comes *Mountain Medicine & Technical Rescue*, a book sure to come to be known as the bible for mountain rescue organizations and their medical advisors. This resource was inspired out of need for a textbook for the international Diploma in Mountain Medicine (DiMM). For those unfamiliar, the DiMM was born in 1997 out of collaborative work between reputable rescue organizations: the Union Internationale des Association d' Alpinisme (UIAA), International Commission for Alpine Rescue (ICAR), and the International Society for Mountain Medicine (ISMM). The goal of the DiMM is to impart the skills and knowledge necessary for health care providers to safely and competently supervise and provide medical care in the austere mountain environment. This curriculum includes not only review of best practices and latest evidence in wilderness care, but

also practical experience in the often harsh mountain environment. This is meant to ensure development of how to safely manage one's own safety and minimize risk to others in a technical rescue effort. For this reason both medical and technical components are emphasized in this text, reflecting this effort to bridge the gap between medical practitioners and rescue technicians.

The succinct medical components of the text are easily accessible to providers ranging from guides and ski patrollers to emergency physicians. Emergency physicians gain insights on practical and safe interventions for medical conditions rare in the urban setting, but common in the mountain setting such as acute mountain sickness. Guides and expedition leaders will find useful topics not often reviewed in Wilderness First Responder or even Emergency Medical Technician courses. How do you safely assess the fitness of an individual with pre-existing medical conditions for mountain travel? Are there any evidence based recommendations on how I should stock my first aid kit? How do I decide if a diabetic emergency requires evacuation? It's all in there.

Mountain Medicine & Technical Rescue also provides the reader or organization with a holistic view of mountain rescue that goes well beyond the basics of the on-site operations in the mountain environment. Owing to the philosophies of the experienced and well-traveled writers and editors, themes of personal and team safety, communication, and reflection permeate the chapters from start to finish. Photos and illustrations complement the simple and straight-forward text. Dogma is nowhere to be found; instead the editors promote *key concepts*, detailing roles and general responsibilities inherently found in technical rescue. The water is never muddied by addressing such hot button topics such as horizontal vs. vertical litter configuration or single-main single belay systems vs two tensioned systems. On the other side of the coin, peripheral chapters that include helicopter operations, the incident command system, and common missteps of teams appropriately supplement the meat-and-potatoes chapters describing the operations.

Note that title of the text describes mountain rescue, not *search and rescue*. While the manual well describes the operations of an avalanche rescue, it does not broach glacier rescue techniques, nor does it open Pandora's Box of what it means and how to pull off a successful search. We await such future chapters in the second edition.

Furthermore, it's hard to expect that such a text would be need to be a comprehensive review of all wilderness medicine topics, as the seventh edition of a comprehensive 3000 word textbook already fills this niche. The authors themselves, however, reference observational data that the still most commonly encountered conditions include gastrointestinal complaints, athletic strains and sprains, and soft tissue injuries. Perhaps a deeper dive into musculoskeletal injury evaluation such as the knee exam, a review of waterborne illness prevention and management, or some examples of wound care and field dressing techniques would serve their future audience well.

Regardless, *Mountain Medicine & Technical Rescue* reviews how to deliver the best care possible in the mountains, paints concepts and systems that work, leaving the reader with a coherent picture of how to pull off adequate aid and rescue in technical terrain. If one were to build a technical mountain rescue team from ground up, this would be the manual at its foundation. This is sure to be on the bookshelf of any mountain rescue professional or aspirant.

Further information about the book may be found here: https://www.mmtrrescuemed.com/

Book Review: 2017 American Caving Accidents 50th Anniversary Issue

Reviewed by Scott Linn, Corvallis Mountain Rescue Unit

This year is the 50th anniversary of the publication of American Caving Accidents (ACA), the caving world equivalent of Accidents in North American Mountaineering. In fact, the ACA report was initially based on the ANAM reports and the information it provided to climbers to be better prepared in their recreational pursuits. This is a publication of the National Speleological Society (NSS) and is a member benefit. Current and past copies of the ACA reports can be purchased from the NSS Bookstore at caves.org. Note that there isn't always an issue every year; multiple years will sometimes be combined into the same issue.

The ACA report is always educational and interesting, and the 50th Anniversary issue goes much further, with 13 feature articles on NSS cave rescue history, cave safety, suspension trauma, contingency rigging, etc. There are also two years of accident reports (2015/2016), plus numerous statistics and analyses covering 50 years of caving accidents. Also of note is that ACA covers accidents in locales other than just the United States such as Canada, Mexico, Guam, Jamaica, etc.

A number of the feature articles are directly applicable to MRA teams: Cave Rescue Preplanning, Rappel Testing, Suspension Trauma, SPAR techniques, Contingency Rigging, PTSD and Cave Rescue, An Introductory Guide to Carabiners, etc.

One of the featured articles describes the Small Party Assisted Rescue (SPAR) class, a type of self-rescue class that is seeing much interest in the caving community. I have attended two 4-day SPAR classes recently in Oregon, and the mountain rescue and SAR communities were well represented in the classes. In fact, more than 80% of the students in the first SPAR class I attended were from the Mountain Rescue community. These classes teach some very useful techniques you won't generally see other places, and are equivalent (or better than) most ropes courses and are much less expensive. I highly recommend these SPAR classes to anyone interested in self-rescue or putting a rescue together with limited resources.

Falls represent the majority of accidents in caving, which is the same in mountaineering. Entrapment/stranding is second, which is a ways down the list for mountaineering accidents but does show up in the top 7. One ACA incident report that might be of special interest to mountain climbers is the case of bad air in the summit steam caves on Mt. Rainier. There are similar features on Mt. Hood, also with suspect air, that rescuers might have to deal with at some point if a climber falls at the wrong spot. Another interesting report involves a high-lumen light turning on in a cavers' chest pocket, burning him and leaving a permanent scar. I have witnessed climbers' lights turn on in their packs (visible through the nylon), and equipment damage or even a fire could result. Having a way to disable a light from accidentally turning on when not in use is something we all need to deal with.

I highly recommend that MRA folks take a look at the ACA reports, and especially this special 50th anniversary issue. You will definitely learn something, and the incident reports can be very interesting.

Overview of MRA 2017 Mission Reporting to Date

Todd Lemein, Corvallis Mountain Rescue Unit

What follows is a brief overview of mission reporting data that has been submitted to the MRA. We hope to publish a follow up overview in the Winter issue with a full data set. We hope all teams can get their data in and that the membership finds the overview of interest.

To date there have been 862 total missions reported to the MRA. These missions took place in 13 states which fall within the following census regions: Mid-Atlantic, Mountain West, New England, and Western Pacific. The majority of reported missions have occurred in Arizona and California, with Colorado and Utah having higher amounts of missions as well (Figure 1). Total number of missions reported declines with date but this is likely a result of incomplete reporting (Figure 2). Somewhat surprisingly, total amounts of missions for the first two quarters of 2017 are relatively similar, albeit with a noticeable spike in reporting in June. The categories of reported missions is diverse with accidents involving recreation such as snow sports, hunting, fishing, climbing, mountaineering, and social/health issues such as Alzheimer's, runaways, lost children, and suicide (Figure 3). The vast majority of reported missions involved hikers. Ground teams, air support, cell phone GPS, and passersby were common factors in finding subjects when data was available (Figure 4).

Figure 1. Total number of missions reported by month from all reporting teams. Total count is 862.

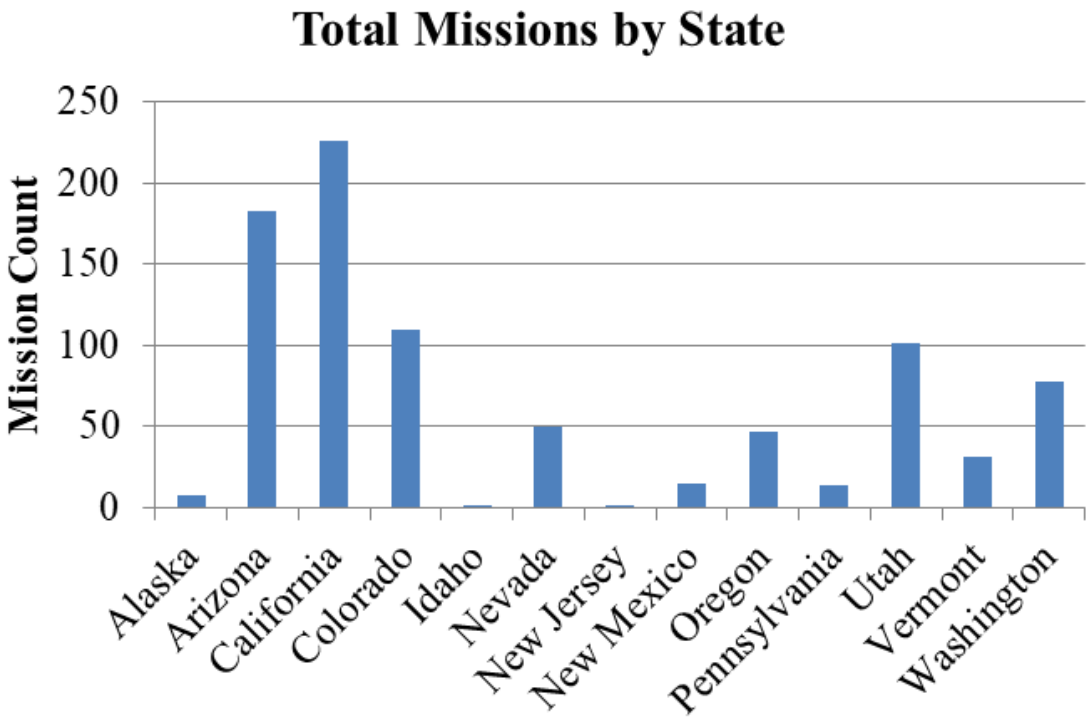

Figure 2. Total number of missions reported by state to date.

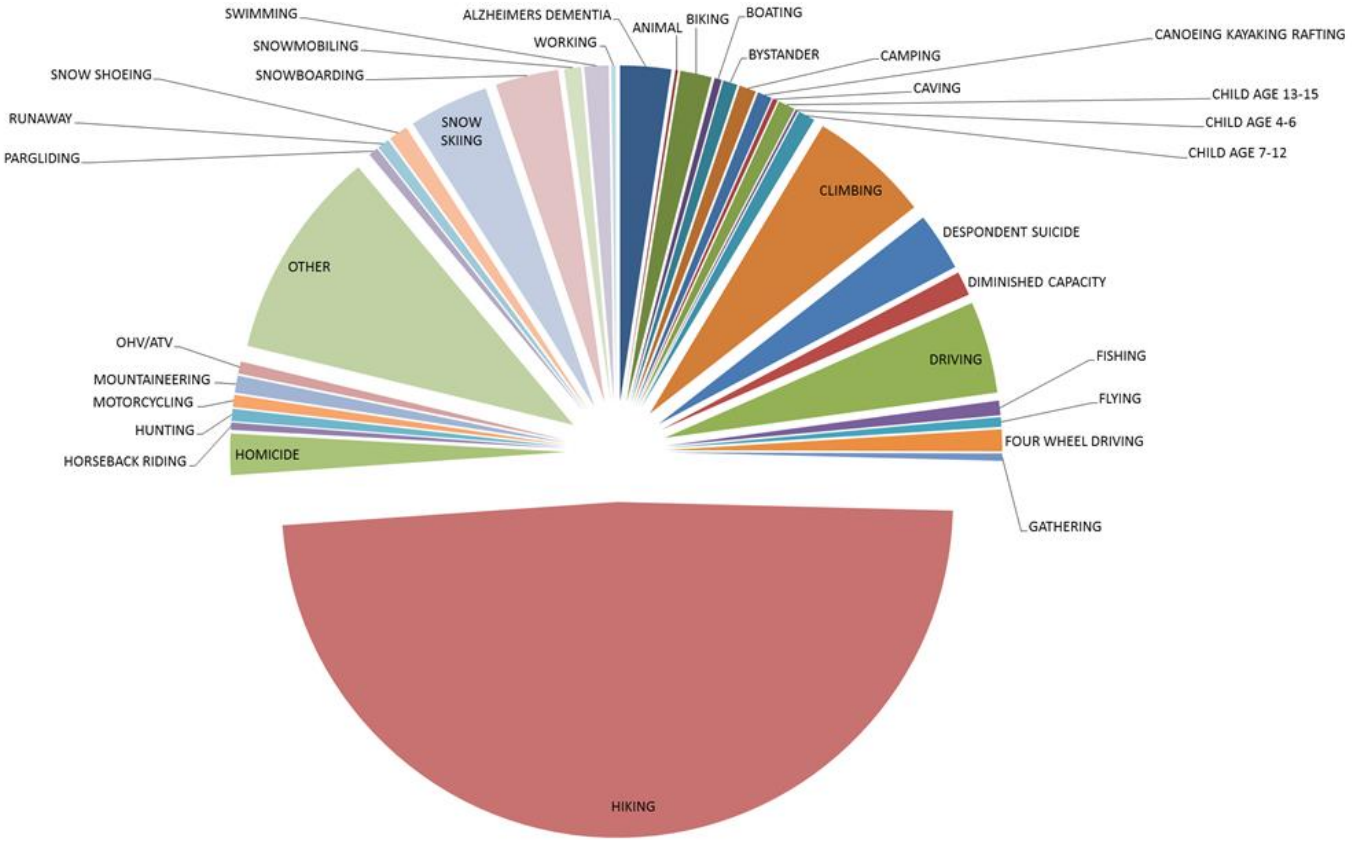

Figure 3. Types of activities subjects were engaged in for reported missions.

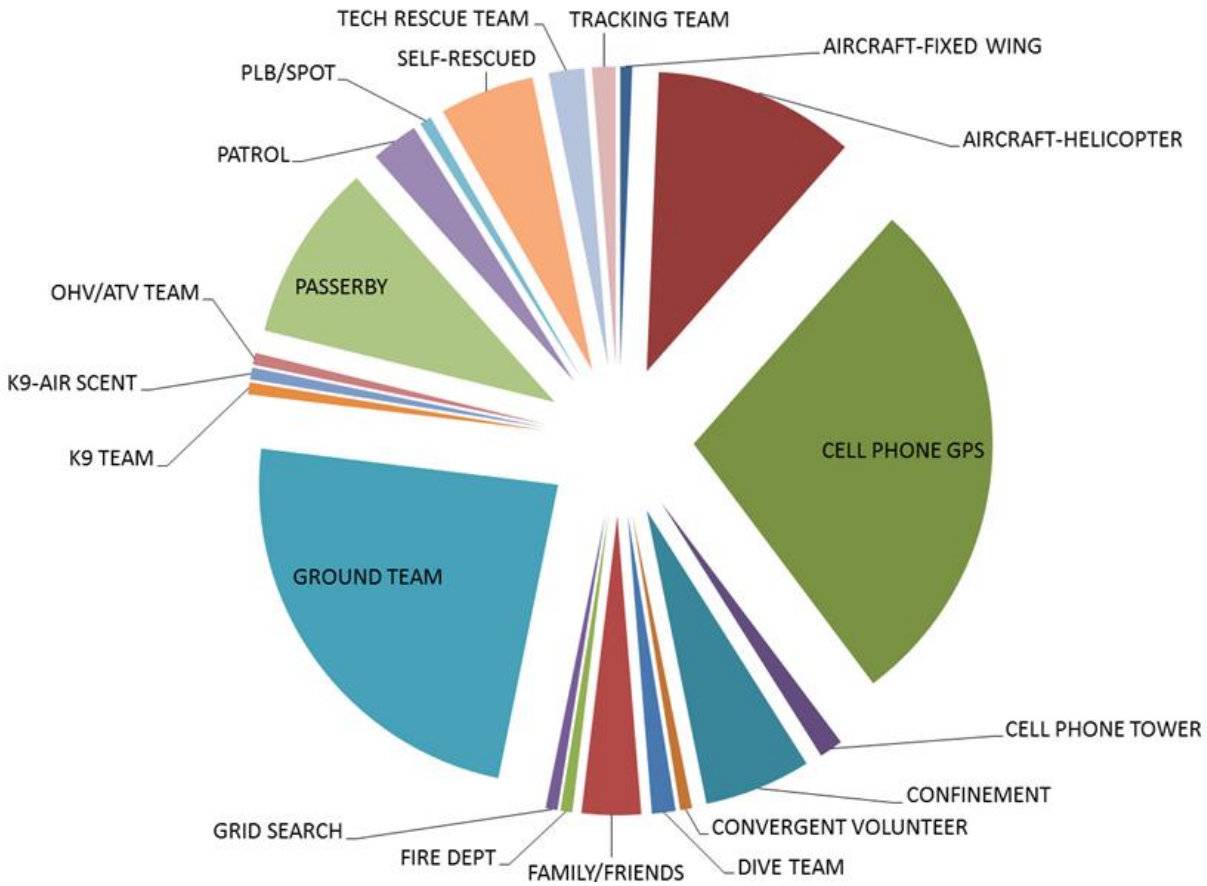

Figure 4. A total of 156 missions had data that included how subjects were located. Cell phone GPS, ground teams, air support, and passersby were the most common means of finding subjects for the available data.

Editor's Note

It was a cold and clear fall that was punctuated with a bit of early season snowfall here in Oregon. I hope that you will enjoy the contributions from MedCom and the overview of the spring conference from Antonio Arizo. Thank you to Scott Linn, and Drew Hardestry with Dr. Terry O'Connor for their reviews of American Caving Accidents (2017) and Mountain Medicine and Technical Rescue, respectively. I hope that the summary statistics I provided are a useful overview of the mission reporting data to date. Thank you to all who have reported their mission data.

Todd Lemein

MRA Meridian Editor

Do you know where to find the MRA?

https://www.facebook.com/MountainRescueAssociation

http://twitter.com/MtRescueassoc

http://mtrescueassoc.blogspot.com

Show your support of your team!

Outfit yourself with goods from the MRA store.

Log on to the MRA website, and place your order!

SHOP HERE (Members Only)!