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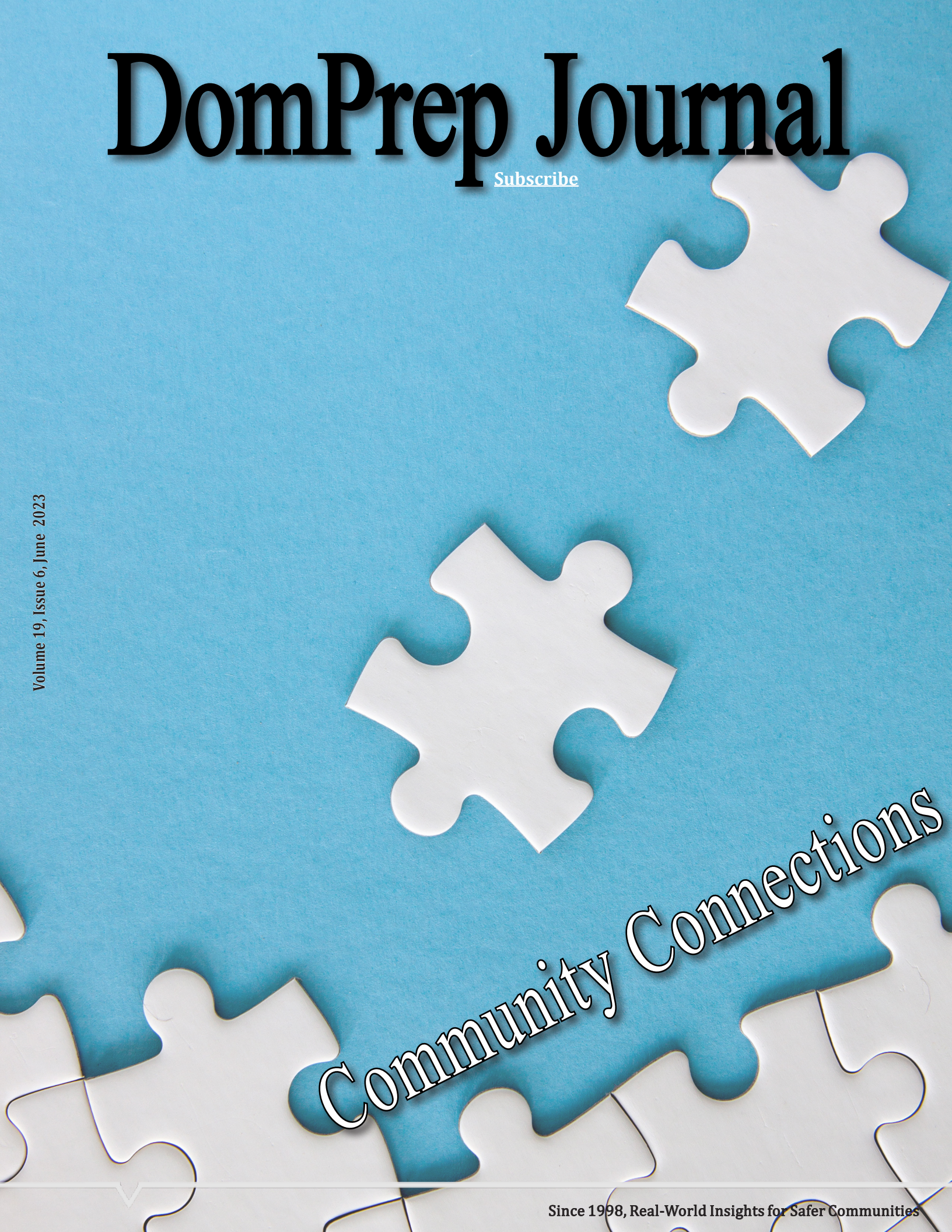

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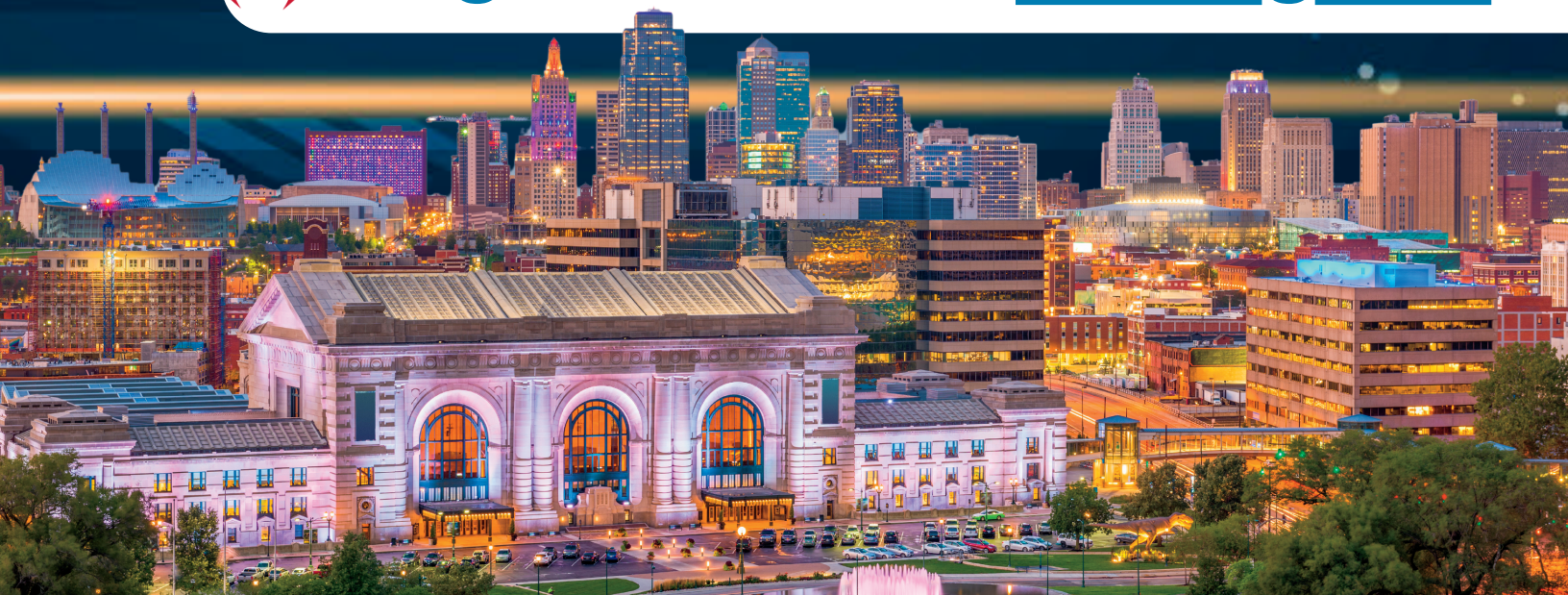

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Featured in This Issue

Pictured on the Cover: ©iStock/Mark Catiglia

Getting Ready for the Next Emergency

By Catherine L. Feinman

Planning, training, learning, mentoring, stockpiling – there are many actions people take to get ready for emergencies and disasters. Each person, agency, organization, and sector have a unique way of preparing for anticipated and unexpected events. However, the need for good leadership crosses disciplines. On May 30, 2023, Domestic Preparedness brought together five leaders who discovered their strengths and arrived at their positions along different career and life paths. A key takeaway from that discussion is that each person must be ready when needed. Emergencies are not planned events, so the question is, "Will you be able to step up, say yes, and lead at a moment's notice?"

Many private citizens are taking steps to assist in crises, build personal resilience, and bridge critical emergency response gaps. For example, after receiving specialized training, service animals are tasked with performing specific daily tasks. However, their critical roles must integrate into other emergency response efforts. This requires awareness and coordination with first responders and others assisting in the aftermath. Amateur radio operators also train to voluntarily operate and, when needed, serve as a communication lifeline during emergencies. The National Association for Amateur Radio's annual Field Day in June was a great opportunity for individuals and clubs to practice and fine-tune their skills.

In organizations and agencies, first responders and public health agencies train and prepare for numerous scenarios but cannot anticipate every possibility. In some cases, prank calls can drain critical resources when law enforcement, fire, and medical services may be needed elsewhere. In other cases, these calls may endanger the safety and lives of the responders. In either case, organizations and agencies must be ready to address these challenges. In the public health space, COVID-19 highlighted the need to evaluate existing plans and ensure that the field promotes a readiness mindset.

During an emergency, it is common for communities – comprising private citizens to large agencies – to come to the aid of others. The interdependencies become more apparent when one or more services, critical infrastructure sectors, etc. are interrupted. In this June 2023 edition of the *Domestic Preparedness Journal*, representatives from various sectors share the strides that practitioners are making and the challenges they face within their areas of expertise. Emergencies will happen, and they will not wait for us to get ready.

Catherine L. Feinman, M.A., joined Domestic Preparedness in January 2010. She has more than 30 years of publishing experience and currently serves as Editor of the Domestic Preparedness Journal, www.DomesticPreparedness.com, and the DPJ Weekly Brief, and works with writers and other contributors to build and create new content that is relevant to the emergency preparedness, response, and recovery communities. She received a bachelor's degree in international business from University of Maryland, College Park, and a master's degree in emergency and disaster management from American Military University.

Unleashing the Power of Amateur Radio in Times of Emergency

By Scott Roberts and Desiree Baccus

As advocates for amateur radio and firm believers in the importance of emergency preparedness, it is critical to raise public awareness and promote active engagement in emergency preparedness through the lens of amateur radio. In today's unpredictable world, individuals must have the knowledge and tools to handle emergencies effectively. Amateur radio is vital in connecting communities and providing essential communication during crises. By sharing practical tips, resources, and success stories, individuals can explore amateur radio as a rewarding and empowering avenue to contribute to national safety. Embracing amateur radio as a tool for communication and community support fosters a culture of resilience and preparedness to overcome future challenges.

Participating in amateur radio as a hobby, individuals contribute to a network of skilled communicators who serve as lifelines during emergencies. Operators undergo training and acquire expertise in emergency procedures, message handling, and operating under adverse conditions. Their ability to relay essential information, coordinate resources, and provide situational updates enhances the efficiency and effectiveness of emergency response operations. Moreover, the interconnectedness of amateur radio networks allows for collaboration and mutual assistance among operators locally, regionally, and globally, amplifying the impact of their collective efforts in times of need.

> *Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.*
>
> *—Code of Federal Regulations Title 47 Chapter 1 Telecommunications Subchapter D Part §97.1a for Amateur Radio Service)*

Emergency Operations Support

Various amateur radio emergency organizations exist to support public service and emergency communications, providing coordination and resources for operators involved in critical situations. These organizations work closely with local authorities, disaster response agencies, and volunteer groups to ensure effective communication during emergencies.

Various amateur radio emergency organizations exist to support public service and emergency communications. Some of these organizations include:

- Amateur Radio Emergency Service (ARES) – ARES is operated by the Amateur Radio Relay League (ARRL) and consists of licensed amateur radio operators who volunteer their qualifications and equipment for communication duty in the public service during disasters. ARES operates at the county, state, and national levels.
- *American Red Cross (ARC)* – The ARC collaborates with amateur radio operators to assist in disaster and emergency response. Many local ARC chapters have amateur radio teams; using amateur radio provides flexibility and a wider communication range.
- *Community Emergency Response Teams (CERT)* – CERT members are part of local emergency management teams trained to respond to emergencies. While not all CERT groups use radio communications, some utilize amateur radio operators and networks to support their operations.
- *Radio Amateur Civil Emergency Service (RACES)* – RACES is an emergency communications service under the Federal Emergency Management Agency (FEMA). Licensed radio amateurs certified by a civil defense agency can communicate on amateur radio frequencies during drills, exercises, and emergencies.
- *Radio Emergency Associated Citizens Teams (REACT)* – Originally established in 1962 to monitor citizens band Channel 9 for emergency and motorist assistance calls, REACT teams have expanded their communication services to include citizens band (CB) radios, personal radio services, and amateur radio. Most REACT teams incorporate amateur radio operators into their operations in various capacities.
- *Salvation Army Team Emergency Radio Network (SATERN)* – SATERN is a volunteer organization of licensed amateur radio operators specializing in emergency communications and message handling. They dedicate their time and skills to support Salvation Army operations during local, regional, and international disasters. SATERN has local organizations in all 50 states of the United States, Canada, and various parts of the world.
- SKYWARN® – SKYWARN is a volunteer program with trained weather spotters who provide timely and accurate reports of severe weather to the National Weather Service. In some areas, amateur radio networks and repeaters relay weather observations to local emergency management and the National Weather Service.
- *Local Amateur Radio Clubs* – Apart from these fantastic organizations, amateur radio clubs' robust local and regional networks also play a crucial role in providing public service and emergency communications. Some clubs actively support ARES and RACES operations in their respective areas, while others offer communication services for public events like parades, bike tours, and marathons. Major events like the New York and Boston Marathons rely on amateur radio operators to ensure smooth operations. Amateur radio enthusiasts often work behind the scenes at large-scale events.

Filling the Communication Gap

The rules and regulations governing amateur radio highlight its objective to provide voluntary noncommercial communication services, particularly during emergencies. Amateur radio operators take emergency preparedness responsibility seriously, assisting various organizations with public service and emergency communications. They provide real-time severe weather reports, aid in search and rescue missions, coordinate efforts during disasters, and support international aid groups in the aftermath of calamities.

Amateur radio fills communication gaps that often occur during emergencies when conventional systems fail or become overwhelmed. It is a reliable alternative when cellphone towers go down or in areas with limited coverage. Operators can establish ad-hoc networks, utilizing traditional voice communication and various digital modes to send emails and files.

Amateur radio operators serve as a lifeline during emergencies by relaying essential information, coordinating resources, and providing situational updates.

A notable example of amateur radio's effectiveness in emergencies is its response to Hurricane Maria in 2017. When the hurricane devastated Puerto Rico, causing power and communication failures, amateur radio operators from the mainland assisted the Red Cross in relief efforts. They provided crucial information, shared updates on infrastructure, and utilized digital communication systems to send messages and files, becoming a reliable communication lifeline.

> *For all intents and purposes, all communication in Puerto Rico was knocked out. Every single cell tower in Puerto Rico suffered some type of damage.… In those first days following Maria's landfall, it was amateur radio that accomplished the mission when everything else failed because ham radio is so nimble. We could deploy an operator to a remote location with a radio, wire, and generator, and they would be operating within half an hour. As a result, we were the first communication organization that could establish two-way contact from any location on the island. We were the light infantry of communication, "holding" a position behind "enemy lines" until robust forms of communication came back online.*
>
> *—Joe Bassett, W1WCN, ARRL "Force of Fifty" member who went to Puerto Rico to support recovery efforts (September 2017).*

Technical Requirements

Amateur radio frequencies used in emergencies vary depending on the situation. High Frequency (HF) is used for long-distance communication. In contrast, Very High Frequency (VHF) and Ultra-High Frequency (UHF) are utilized for smaller areas and local networks like Skywarn, providing severe weather information. Gigahertz (GHz) frequencies may sometimes be necessary for high-speed data communications.

While a Technician Class license is sufficient for initial public service and emergency communications on VHF and UHF (shorter range) bands, upgrading to at least a General

Class license is recommended to access HF (long range) frequencies. An Amateur Extra Class license offers additional benefits, including a deeper understanding of electronics and radio wave characteristics. Further information and resources can be found on the Amateur Radio Relay League (ARRL) website. There are study materials, practice exams, and a searchable database on where to find a class, study group, and testing locations within the United States. It can take less than a month to get a license at an average cost of $14 for the Federal Communications Commission (FCC) fee and an average of $15 for the local club volunteer examiner team. As of June 14, 2023, ARRL FCC License Counts show 761,155 amateur radio operators in the United States.

Personal Action Toward Community Preparedness – Get Involved Now!

It is not about which emergency preparedness organization one chooses to support, as all these organizations are engaged in critical work to bolster communities. What truly matters is taking the step to obtain an amateur radio license today, as it enables individuals to participate in training programs with any of these reputable organizations tomorrow. Doing so makes them valuable resources for themselves, their loved ones, and their communities when a crisis strikes unexpectedly. The license empowers them to lend a helping hand, provide vital communication services, and offer support in times of need. They should act now and make a difference when it matters most.

A great way to delve deeper into amateur radio and connect with fellow operators is to visit one of the numerous amateur radio clubs participating in the nationwide ARRL

Scott Roberts, KK4ECR Emergency Mobile Operations for Clay County Amateur Radio Emergency Services in Florida (*Source:* Scott Roberts, 2023).

Field Day operations on June 24 and 25, 2023. This annual event provides a unique opportunity to witness firsthand how amateur radio works across various modes and serves as an excellent platform for promoting science, technology, engineering, and mathematics (STEM) education, particularly to the youth. By attending these events, individuals can engage in demonstrations, explore lesson plans catered to different age groups, and gain a comprehensive understanding of the diverse facets and opportunities offered within the amateur radio community.

What makes these gatherings truly remarkable is the emphasis on inclusivity and the whole family's involvement. Amateur radio recognizes that each member has a valuable role in emergency preparedness. From young children learning about basic radio concepts to parents and grandparents honing their communication skills, there is a place for everyone at every age and ability to learn and grow. By actively participating in amateur radio activities, families strengthen their bonds and cultivate valuable skills and knowledge that can be instrumental during unforeseen emergencies. These events offer an incredible opportunity to witness the power of collaboration, work as a team, and understand how vital communication is in these types of situations as amateurs come together to showcase their expertise, share experiences, and inspire others to become a part of this fulfilling hobby and essential service.

Amateur radio operators empower themselves and their loved ones to overcome the challenges posed by disrupted infrastructure, overwhelmed networks, or limited access to traditional communication channels. Their amateur radio licenses provide a lifeline of communication that can bridge gaps and connect individuals, allowing for essential updates, assistance requests, and relief efforts coordination. It provides redundancy and ensures that important messages reach their intended recipients. During high-stress situations, knowing what to do, having clear guidelines, well-practiced routines, and designated roles enable quick decision-making and accurate information dissemination. With amateur radio, families can confidently navigate emergencies, knowing that they have the means to stay connected, informed, and in control.

Scott Roberts, KK4ECR, a dedicated amateur radio operator, obtained his license in 2011, driven by his desire to make a positive impact on the community. Joining the Clay County Amateur Radio Emergency Service (ClayARES), he actively contributes to various events. Recognizing his passion for emergency communication, he was appointed assistant emergency coordinator for Clay County and section manager for the Northern Florida Section of ARES. He has demonstrated his expertise as a net control operator in the face of five hurricanes that have struck Florida, effectively directing amateur radio communications from the Emergency Operations Center. His valuable connections with public officials in Clay County, Florida, reflect his commitment to fostering collaboration. Additionally, he has shared his knowledge and experience through published articles and a book dedicated to amateur radio.

Desiree Baccus, N3DEZ, is a dedicated emergency management professional with a passion for amateur radio. She plays vital roles in many amateur radio and emergency response groups, such as Community Emergency Response Team (CERT) and NASA Ames Research Center's Disaster Assistance & Rescue Team (DART), showcasing her expertise and dedication to emergency communications. She also has served as the secretary and vice chair for the Colorado Federal Executive Board (CFEB) Emergency Preparedness Council (EPC), where she worked toward enhancing emergency response capabilities in her state. As a member of the ARRL's Public Relations Committee, she contributes her expertise in promoting amateur radio and its benefits to the public.


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You're the Leader. Now What?

By Domestic Preparedness

The National Oceanic and Atmospheric Administration (NOAA) reported that, as of May 8, the United States had experienced seven confirmed $1-billion weather/climate-related disasters in 2023. Three more storms that occurred in April may soon be added to that list. According to the Federal Emergency Management Agency (FEMA), 35 major disasters have been declared in 2023 as of June 2. Adding significant natural events to disasters related to technological and human-caused threats, any community or organization can be suddenly thrust into emergency response mode.

When an expected or unexpected event occurs, leadership capabilities are a determining factor for each community's level of resilience and ability to recover. During such times, various titles naturally put some people in leadership roles. However, an impressive title may not equate to a good leader. So, what makes a good leader? In simple terms, leadership is defined as the ability to influence and guide others. When faced with an emergency or disaster, effective leaders can use this ability to achieve organizational goals and maximize community response efforts.

Defining a Good Leader

On May 30, 2023, Domestic Preparedness hosted a multidiscipline panel discussion at the annual Texas Emergency Management Conference in Fort Worth to ask five leaders to share their knowledge and experiences on their paths to developing good leadership skills. These five professionals brought to the table 195 years of combined experience across emergency management, public safety, law enforcement, emergency medical services, hospitals, fire, hazardous materials, military, disaster psychology, and other areas of expertise.

The discussion began with the panelists describing how and when they realized they had become leaders. Some had a defining pivotal moment, and others developed that realization over time. However, the one thing in common was that they all recognized their leadership abilities long before assuming leadership positions within their careers. From there, the panelists answered the following key questions:

- What key characteristics are required to be a good leader?
- During normal operations, how do you build and maintain interagency relationships?
- During large-scale incidents, how do you manage the different leadership styles and jurisdictional differences to effectively work together?

One interesting debate involved the ability of leadership traits to be learned (i.e., nature vs. nurture). Although there may be no consensus on whether leaders are born or made, there was a common theme throughout the discussion that the best way to realize one's potential is to embrace opportunities and step up to challenges when they arise. Other recommendations for being a good leader include keep developing knowledge and skills, continue building resilience, and always communicating within and between organizations.

Each of the following five panelists embraced their leadership roles in different ways. Yet, they all have been and continue to be effective in influencing and guiding others. Click the link to listen to the full panel discussion.

Source: Texas Division of Emergency Mangement, Frank Hicks, (May 30, 2023).

Moderator: Catherine L. Feinman
Editor, Domestic Preparedness
Catherine L. Feinman, M.A., joined Domestic Preparedness in January 2010. She has more than 30 years of publishing experience and currently serves as Editor of the Domestic Preparedness Journal, www.DomesticPreparedness.com, and the DPJ Weekly Brief, and works with writers and other contributors to build and create new content that is relevant to the emergency preparedness, response, and recovery communities. She received a bachelor's degree in international business from University of Maryland, College Park, and a master's degree in emergency and disaster management from American Military University.

Eric Epley
Executive Director/CEO, Southwest Texas Regional Advisory Council for Trauma (STRAC)
Eric Epley is the executive director of the Southwest Texas Regional Advisory Council for Trauma (STRAC) in San Antonio, Texas. STRAC serves 22 counties that stretch over 26,000 square miles, whose membership includes 55 hospitals, 75 emergency medical services (EMS) agencies and 14 helicopter bases. He is a Certified Emergency Manager with nearly 35 years in public safety response and administration, a nationally registered paramedic for over 30 years, and a licensed police officer for 13 years, serving as a tactical paramedic at the Branch Davidian standoff, the Republic of Texas standoff, and other high-profile Texas incidents. He currently serves as an advisor to the Domestic Preparedness Journal.

James (Jim) Featherstone

Principal Consultant, Themata Strategic LLC

James (Jim) Featherstone is a principal consultant at Themata Strategic LLC, a crisis management consultant agency. Previously, he was the executive director of the Los Angeles Homeland Security Advisory Council, a position he assumed in March 2016 after serving the City of Los Angeles for thirty years. A native of Washington, D.C., and a veteran of the United States Navy, he began his public service to the City of Los Angeles in 1986 with the Los Angeles Fire Department. He was later appointed interim fire chief (2013-2014). In 2007, he was appointed general manager of the Los Angeles Emergency Management Department. From 2008 to 2018, he chaired FEMA's National Advisory Council. He holds a Master of Leadership from the University of Southern California and a Bachelor of Public Administration from Union Institute and University. He is an alumnus of the Executive Leaders Program at the Naval Postgraduate School's Center for Homeland Defense and Security. He is also a senior fellow in the Harvard University Kennedy School of Government's Program on Crisis Leadership.

Major Rhonda Lawson

Major, Texas Department of Public Safety

Rhonda Lawson, a native of Washington, DC, has been employed by the Texas Department of Public Safety since 1997, where she serves as a major in the Texas Highway Patrol (THP). Major Lawson previously served as the disaster district chair for DDC 20 in Corpus Christi from 2008-2012. In October 2012, she transferred to the Division of Emergency Management as the captain in Emergency Operations. In 2016, she was appointed to major for the Texas Division of Emergency Management (TDEM). In 2019, when TDEM was established as an independent agency under the Texas A&M University System, she transferred to the Texas Highway Patrol Division and serves as the major over the Highway Safety Operations Center and is the liaison between THP and TDEM. Major Lawson is a member of the National Association of Women Law Enforcement Executives, International Association Chiefs of Police, National Organization of Black Law Enforcement Executives, Black State Troopers Association, and Department of Public Safety Officers Association. She is also a member of the Law Enforcement Committee at the All-Hazards Incident Management Teams Association. She holds a Master Peace Officer License and Basic Instructor Certificate through the Texas Commission on Law Enforcement and is a Certified Emergency Manager (CEM). She is a graduate of the 231st Northwestern University Center for Public Safety's Police Staff and Command School where she served as the vice president. Lawson earned a Bachelor of Science Degree in Criminal Justice from the University in 1987 and is currently pursuing a Master of Science in Emergency Services.

R. W. "Bob" Royall Jr.

Assistant Chief (Retired), Emergency Operations at Harris County Fire Marshal's Office

As assistant chief, Bob Royall was responsible for the overall operation of the Harris County Fire Marshal's Office (HCFMO) Emergency Operations, reporting directly to the fire marshal. He began his career in the fire service in 1973 with the City of Houston Fire Department, retiring as a senior captain after 31 years, over one-third of which as a coordinator of the hazardous materials response team. He began his tenure with HCFMO in 2005 as assistant chief. He also served as HCFMO's chief of staff, chief of risk management, chief financial officer as well as in leadership roles on numerous local, state, and national committees. Bob is a principle member of the NFPA 470 and NFPA 475 Technical Committees, Chairman of the International Association of Fire Chiefs (IAFC) HazMat Committee, and Chairman of the Texas Emergency Management Advisory Executive Committee.

Mary Schoenfeldt

Board President, Green Cross Academy of Traumatology

Mary Schoenfeldt, Ph.D., is the board president of Green Cross Academy of Traumatology and has responded to countless disasters. She is an emergency management professional specializing in community and school crises and has a passion for disaster psychology. She is a faculty member of FEMA Emergency Management Institute, an adjunct faculty at Pierce College, and a subject matter expert for the U.S. Department of Education. She also serves clients through her consulting business. She can be reached at yoursafeplace@msn.com

Service Animal Awareness in Disaster Response

By Melissa Resnick

Although they are companions to their human partners, service animals are not pets. Instead, they are trained to perform specific daily tasks, which are often still required when responders are assisting during a hurricane, mass casualty event, or another emergency. As such, emergency planning efforts should include service animals to ensure responders can identify the animals' critical roles, acknowledge their specialized training, and provide more-effective assistance to the humans who need their help.

The most common species used for service animals are horses and dogs. Horses are used for transportation (pulling buggies) and farm work (pulling plows), often seen in the Amish and Mennonite communities. In addition, miniature horses have been used to assist blind individuals with mobility. However, the preponderance of service animals are dogs, which generally serve three roles: assistance, protection, and detection work.

Critical Roles for Service Animals

Assistance dogs perform specific tasks for their handlers. For instance, assistance dogs for people who are deaf and hard of hearing alert their handlers to specific sounds in the environment, such as doorbells and alarm clocks. Dogs that assist individuals with physical disabilities perform tasks that would be difficult or impossible for the handler, such as picking up dropped items. Guide dogs help the blind or visually impaired by alerting them to stairs and curbs, taking them around obstacles such as poles, and safely crossing streets.

As this role states, protection dogs provide protection. For example, they often protect their owners from environmental threats, such as other humans and dogs. In addition, they can be trained to protect property such as homes and businesses.

Service animals perform specific daily tasks, which are often still required when emergency responders are on the scene.

Detection dogs perform various tasks. Some sniff out compounds such as explosives and narcotics. Border dogs are often trained to detect illegal items like guns and gun parts. Search and rescue dogs are skilled at finding live humans buried in rubble or avalanches. In addition to survivors, detection dogs have been used to locate deceased victims and human remains.

Dogs are being used in medical contexts as well. For example, some dogs can detect seizures and diseases like diabetes and cancer.

Training

Service dogs are usually trained via organizations or individuals. For instance, many guide dogs go through formal programs by organizations such as "Seeing Eye" and "Guiding Eyes for the Blind." However, other guide dogs are trained by their individual handlers.

Similar situations occur with search and rescue dogs. However, there is one difference. For the Federal Emergency Management Agency, canine/handler teams undergo a rigorous certification process. Unfortunately, many, if not most, other canine/handler teams – even those trained by organizations – are not certified.

Standardization is another critical issue. No two organizations or individuals train service dogs in precisely the same way. There are differences, even between the two well-known guide dog training organizations mentioned above. However, many organizations do provide well-trained service dogs.

Knowing If Dogs Are Service Dogs

Sometimes, knowing whether the dog is a service dog can be easy. Handlers, such as policemen and search and rescue dog handlers, are likely to be in uniform. In these cases, the dog will most likely be on a leash and wear a harness, a vest, or both. Of important

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note for first responders, the dog may not be wearing this equipment while riding in a car. However, the equipment will likely be present, lying on the seat or floor of the vehicle.

There are other cases in which it is more difficult to discern if the dog is a service dog – for instance when the handler's disability is not visible. Still, a dog on a leash wearing a vest, a harness, or other equipment may indicate a special situation. Under the Americans with Disabilities Act, one can ask the handler: "What work or task has the dog been trained to perform?"

Considerations for Emergency Responders

There are three primary recommendations emergency responders should keep in mind when encountering service dogs during emergencies:

- Be aware that the service dog may be upset as their handler is injured. Despite the animal's training, they may jump, bark, and whine to show distress. Talk to the dog in calm and reassuring tones.
- Keep the service dog with its handler whenever possible. Separation can cause distress for both the animal and the handler.
- Talk calmly to the service dog if it must be separated from the handler. Reach out slowly in a non-threatening manner. If not present, attach a leash to the ring on the collar and lead the dog away to a safe place. If a handler's friend or relative is present and not injured, the animal can be given to them. Be aware, however, that the service dog will most likely resist being led away from their handler. If the handler is conscious, tell them why the service dog needs to be taken away and where it is going.

In summary, service dogs can be trained by either organizations or individuals for assistance, protection, or detection work. In these roles, these animals are trained to perform many tasks. During an emergency, responders must recognize and understand the roles service dogs play and coordinate their efforts to best serve the people they both are there to assist.

Dr. Melissa Resnick is presently a research scientist at the University at Buffalo, Jacob School of Medicine's Department of Biomedical Informatics. Melissa (with guide-dog "Lido") earned a bachelor's degree in biology from the University at Albany, a master's (with guide-dog "Ember") in psychology from Rensselaer Polytechnic Institute, a master's (with guide-dog "Ditto") in library science from Queens College, and a doctorate (with guide-dog "Cora") from the University of Texas, Health Science Center at Houston in biomedical informatics. She spent 4 years of academic fellowship at the National Institutes of Health's National Library of Medicine. Becoming interested in the intersection of medicine, informatics, and disaster preparedness/emergency management ("DPEM") during a national pandemic, Dr. Resnick began supplemental studies in Frederick Community College's degree program in emergency management and is currently pursuing a master's in DPEM at Arkansas State University, which focuses on healthcare. She recently earned her Associate Emergency Manager (AEM®) professional designation from the International Association of Emergency Managers and is presently pursuing the Certified Emergency Manager (CEM®) professional designation. Melissa has been fortunate to independently travel to over 15 countries, Alaska, Hawaii, and most major U.S. cities. Dr. Resnick is open to professional collaborations.

Swatting: Combatting a Lethal and Expensive Prank

By Dan Scherr & Tanya Scherr

May 3, 2023, saw a rash of hoax calls claiming to report active shooters in schools across Tennessee. While the calls initially affected the Middle Tennessee area, the issue quickly moved to additional areas within the state, affecting at least 16 schools on the same day. Local, state, and federal employees, including the Tennessee Bureau of Investigation, continue to work together to locate the source of the coordinated attacks. The impacted Tennessee cities and schools included:

- Knoxville: Central High School
- Dandridge: Jefferson County High School
- Morristown: West High School
- Kingsport: Dobyns-Bennett High School
- Bristol: Tennessee High School
- Johnson City: Science Hill High School
- Clarksville: Rossview Elementary
- Chattanooga: Brainerd High School
- Greeneville: Greeneville High School
- Greeneville: Greeneville Middle School
- Jonesborough: Sulphur Springs Elementary School
- Dyersburg: Dyersburg High School
- Martin: Martin Middle School
- Savannah: Hardin County High School
- Columbia: Columbia Central High School
- Nashville: Martin Luther King, Jr. Magnet School

These calls followed on the heels of the recent Covenant school shooting, which took place in Nashville on March 27, 2023, and made national headlines for the immediate actions of the police response teams. These targeted calls, called *swatting*, are part of a larger trend occurring across the U.S., with reports identifying swatting incidents in K-12 school districts in Washington, California, and Vermont (among others) to higher education campuses across the country. According to the Federal Bureau of Investigation (FBI), these types of calls increase after school shootings. In October 2022, National Public Radio published an article stating that their research uncovered 182 schools in 28 separate states had received swatting calls about active shooters between September 13 and October 21, 2022.

History and Techniques of Swatting

Swatting is making prank calls to bring law enforcement to a specific location, usually a SWAT team. This behavior is an evolution of *phone phreakers*, individuals who hack into the phone system to make free long-distance calls and gather information. Calls then escalated from more generic bomb threats against schools in the 1990s (the closest analog to the current issue, but far from a perfect comparison) to the present day, where swatting schemes can be sophisticated. These calls can come through various locations and do not always specifically target emergency lines, such as 911. For example, several of the swatting calls in Tennessee went directly to the schools, prompting them to contact 911 for assistance. Additionally, there are several ways that swatting calls are made, all with the effort of masking the actual caller's location and identity. Examples of these techniques include:

- Social engineering or doxing,
- Caller ID spoofing,
- Voice over IP (VOIP), and
- Teletypewriters (TTY) and other text telephone devices.

In 2022, two individuals (from Wisconsin and North Carolina) were charged with a dozen swatting incidents in 2020 that also incorporated accessing Ring devices at the targeted homes. The individuals illegally accessed the Ring devices and then placed false emergency calls to the houses. They then live-streamed the law enforcement responses to the calls and used the devices to taunt the responding officers. These incidents occurred across the country and prompted the FBI to issue a public service announcement reminding citizens to use complex passwords and two-factor authentication to help prevent these types of incidents.

Swatting should not be confused with prank calls, as the primary intent behind these actions is to hurt or harass individuals or overtask the emergency response system. There have been several instances over the last decade where swatting has led to injury or death:

- In 2015, a police chief was shot while responding to a hoax bomb threat being planted at a daycare. The caller confessed that he called in the threat and pretended to be the accused because he was angry at him.
- In 2017, a swatting call resulted in the death of the intended target because the caller was arguing with him during a Call of Duty game online.
- In 2020, a senior citizen died of a heart attack when police responded to his home after a swatting call suggesting that he was killing someone in his home. This hoax occurred because someone simply wanted the deceased's Twitter handle.
- In 2022, a police officer crashed into a civilian vehicle while speeding to the scene of a swatting hoax – both parties were transported to the hospital for treatment.

Historically, swatting was used to target specific individuals, such as politicians, social media influencers, gamers, or individuals that have upset another person. However, recent swatting data suggests that the practice is expanding and can have concerning outcomes. Additionally, FBI communication says there is reason to believe that many active school shooting swattings are coming from overseas.

During the recent round of swatting calls about schools in Iowa, authorities identified some issues with the calls early in the process. First, all the calls appeared to have the same or similar voice and syntax, and the caller mispronounced words, at least from the local perspective. The caller also called the non-emergency line, a potential red flag for an active shooter situation. The caller also provided vague responses to specific questions or could not provide accurate information on the location or operations at the school in question. Dispatchers, in this instance, were able to prepare for the possible calls and delve deeper into the caller's story as warnings went out early about the hoax calls and characteristics.

Swatting should not be confused with prank calls, as the primary intent is to hurt or harass individuals or overtask the emergency response system.

Adding to the complexity of attribution and addressing the issue are reports that some swatting calls in the recent surge were computer generated. Like many other cybercrime offerings, swatting is believed to now be offered as a service (i.e., criminal activities are paid for by one individual and carried out by a criminal or group specializing in the activity). One such service, Torswats, is based on Telegram and utilizes artificial intelligence calls and responses in close to real-time. This service has been tied to dozens of swatting calls across the United States, but the exact number is difficult to ascertain.

The true scope of swatting is difficult to understand as there is no specific charge or report for these incidents. They may fall between a false police report and a terror threat and be reported differently depending on the jurisdiction. These calls also have very real costs associated in addition to the potential impacts previously discussed. The significant response generated by these calls pulls resources (police, fire, EMS, and dispatch) that are needed in other locations, impacting response and service throughout the targeted areas.

The FBI notes that each of these calls can cost thousands of dollars for law enforcement. This same figure was also provided by head of Austin's SWAT teams, noting it costs upwards of $1,000 per hour each time a SWAT team is deployed there. This can be compared with reports from Arizona and California that place the cost per swatting call at over $10,000 for the taxpayers for the overall response. Those costs also do not take into consideration the physical and emotional toll on not only the students or other individuals targeted by the call but on the responders and dispatchers as well.

Dispatch Intake and Emergency Response

Educating emergency dispatchers and responders on calls that can potentially be swatting hoaxes is an important step but should never replace normal emergency response to a call. Emergency dispatchers should not be put in the position to determine whether a call is real.

The National Emergency Number Association identified some challenges and guidance regarding potential swatting calls. First and foremost, all calls should be processed and forwarded according to standard operating procedures, as it is difficult, if not impossible, to differentiate hoaxes from real calls in the moment. The call taker should document all available details about the caller and ask specific, targeted questions. These can be compared for inconsistencies or used to better inform responders on the scene.

Calls may come into the center from two main sources: direct to the communications office from an individual involved in the incident or relayed from a third party. The call taker has more opportunities to identify inconsistencies and develop information when the call is direct. Still, some recent swatting incidents were called into schools, and employees relayed the information to dispatch.

Potential red flags that should be taken under consideration during these events include:

- Receiving only one call for a life-threatening emergency, such as an active shooter in a public place. These events normally create a large influx of calls to 911.
- Receiving what appear to be life-threatening calls on non-emergency lines. Callers rarely take time to look up a non-emergency number in these situations.
- Receiving calls where the caller cannot be identified (blocked calls).
- Receiving calls from TTY devices. These devices can be used by out-of-area individuals who could not connect to the correct local 911 center otherwise.
- Receiving Skype calls from the 661 area code (according to PSC.org, swatters frequently use this tactic).
- When arriving on scene, basic details do not match what was communicated to the dispatcher (color of house, color of door, other characteristics of the home or yard).

With the rise of call-spoofing technology, Virtual Private Networks (VPNs), Voice Over Internet Protocol (VOIP) calls, and other tools, the location received with a call is not always accurate. Identifying the true location of a caller can require coordination between local, state, and federal law enforcement along with internet service providers and others if it can even be done.

It is important not to get complacent when plagued with multiple swatting events. Each call should be treated consistently, and the response should be the same every time. During a response, consideration should be made for locations that are not personal residences and watch for suspicious activity because the caller could be standing by to evaluate response procedures.

Legislation and Mitigation Measures

The Anti-Swatting Act of 2019 was created to increase penalties for swatting calls and was rolled out as an amendment to the original Communication Act of 1934. The amendment enhanced penalties for the "transmission of misleading or inaccurate caller identification information with the intent to trigger an emergency response." The increased penalties include fines and jail time: up to 5 years if no one was injured and up to 20 years if someone has been injured as a result of the swatting call.

In May 2023, the Virginia governor passed legislation to increase penalties for swatting calls. Following their own spate of swatting calls, New York is also considering legislation to make swatting a Class E felony. Similar legislation was signed by the

governor of Ohio in January 2023, making swatting a felony in that state. Other states also created legislation to address swatting or increased penalties over the past several years. Additional national legislature appears to be in process after the last attempt, in 2021, stalled after being introduced by Senator Kustoff. The Preserving Safe Communities by Ending Swatting Act of 2021 sought to make swatting a crime nationally.

Previous legislation led to several revenge swatting calls against the politicians involved, including:

- 2013: Congressman Lieu, California State Senate Bill 333;
- 2015: Assemblyman Moriarty, New Jersey Bill A-4375; and
- 2016: Congresswoman Katherine Clark, Interstate Swatting Hoax Act.

There are some options to help manage an individual's risk of becoming a victim of swatting. Still, it is difficult to eliminate the practice as it preys on law enforcement response to serious incidents and the need to take all calls seriously. Several state and local communities, including Paradise Valley, AZ, and Seattle, WA, are implementing anti-swatting programs and voluntary registries for those at risk of becoming victims.

Education, awareness, and consistency are critical for responding to emergencies. Even when valid, each call has a wide variance between the incoming call and what officers find on the ground. A report of shouting and arguments in a house may be a violent incident or a television playing too loud. Still, officers must respond in a manner that prioritizes the safety of all involved. The recent spike in swatting calls represents a unique challenge for law enforcement in approaching suspected hoaxes and determining the appropriate response level. As noted earlier, when calls came into Iowa, dispatch centers were notified and additional scrutiny went into calls, but they still needed to be addressed and cleared. Legislation or anti-swatting directories may forestall some of the issues, but responders need to be aware of this challenge and develop policies and procedures locally to address these calls.

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Are Public Health Agencies Ready, or Just Prepared?

By Raphael M. Barishansky

Perhaps it is time to retire the term *public health preparedness*. Public health emergency preparedness has been defined as "the capability of the public health and health care systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities. Preparedness involves a coordinated and continuous process of planning and implementation that relies on measuring performance and taking corrective action." However, there is no currently agreed upon definition for public health readiness. As the COVID-19 pandemic emergency declaration sunsets and officials review their various public health actions, it may be time to collectively take the initiative to retire this term and replace it with *public health readiness*. Some background is in order before genuinely discussing the need for this paradigmatic shift.

The Preparedness Background

In the immediate aftermath of 9/11 and the anthrax attacks that followed, it became clear that the ability of the U.S. public health system to respond to a large-scale emergency was simply not in place, and the discrete discipline of public health preparedness emerged. Congress soon appropriated nearly $1 billion in FY2002 to the Centers for Disease Control and Prevention (CDC), which reorganized its preparedness activities to support states and territories, including creating a new national center known as the Center for Preparedness and Response. Interestingly, this center was initially called the Coordinating Office on Terrorism Prevention and Emergency Response, then renamed as indicated previously and, only recently, again renamed as the Office of Readiness and Response, reporting directly to the CDC director. Multiple grants, including the Public Health Emergency Preparedness and Cities Readiness Initiative, were soon developed and funds distributed to state and local health departments. Simultaneously, the Hospital Preparedness Program was deployed to bring a similar preparedness initiative, and funding, to the healthcare sector. All these grants were geared toward a greater state of preparedness with, at the time, no true definition of the term public health preparedness.

Even without a clear definition of preparedness, state and local health departments formed public health preparedness units. They moved forward with the development of various public health-specific contingency plans, purchase of communications equipment, compliance with Incident Command Systems mandates to coordinate with other, more traditional emergency response entities, and many other initiatives, not the least of which was the recruitment of public health preparedness subject matter experts. Almost ten years later, in 2011, the CDC developed and promulgated a set of 15 emergency preparedness and response capabilities, which now serve as the national standards for public health preparedness planning. The CDC made the latest updates to these capabilities in 2018.

Asking Necessary Questions

In this post-COVID-19 moment, it is necessary to reflect on whether the various preparedness grants made state and local health entities adequately prepared for the pandemic. Consider whether the different emergency exercises and equipment

purchases made state and local health entities fully prepared for the difficulty seen in the following aspects:

- Procurement of personal protective equipment,
- The media and public backlash over fluctuating guidance,
- The increasing politicization of public health, or
- Other elements that made COVID-19 so challenging to respond to.

When answering questions related to these and many more issues related to public health and the public health role in emergency preparedness and response, the industry needs a more all-encompassing term to describe the various actions health agencies take before, during, and even after an emergency. Perhaps that term is *readiness*, as in public health readiness. This term makes sense when viewing preparedness as more of a physical state that speaks to capability and capacity. In contrast, readiness is more of a mental state, specifically being able to apply preparedness when needed; it is a mindset.

Readiness takes into account all of the previous elements that the preparedness grants encompassed but also includes other areas that COVID-19 has shown to be lacking, including supply chain management, a stronger relationship with emergency management, and an organization-wide commitment to public health emergency response. The CDC is thinking along these lines as an element of the next five-year cooperative agreement cycle with state health departments. They have been developing a "Response Readiness Framework," with ten areas through which partners can look at the current 15 capabilities to move to a better state of readiness – these areas include data modernization, health equity, workforce readiness and resiliency, and others.

Is it time for public health entities to replace the term preparedness with readiness? The elements of organizational readiness must at least be contemplated.

Regarding the public health workforce, readiness speaks to understanding how mental health and burnout would impact public health workers who sometimes labor 12-plus hours a day, seven days a week, to make the best decisions for the public they serve. The COVID-19 pandemic saw this issue resurface repeatedly, and this lesson should not be forgotten. Readiness also means considering the capabilities and capacity of the various volunteer community resources (such as Community Emergency Response Teams and Medical Reserve Corps units) and planning appropriately to utilize these resources to supplement health employees when and where applicable. These units were invaluable to many jurisdictions' responses during the pandemic, and memorializing the lessons learned about their effectiveness is a critical readiness next step.

Another element of readiness, as it applies to the workforce, is ensuring that the public health workforce is adequately trained for the diversity of emergencies they may confront and that all feel comfortable in their roles. Again, look at the actions of the CDC, which recently announced that it would require all employees to be ready to deploy to combat national health crises, thus marking a drastic shift from a fragmented volunteer system that hampered its COVID-19 response. State and local health departments, which are integral partners in any large-scale public health emergency response, would also benefit from a paradigmatic shift such as this.

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The Path Toward Readiness

Regarding preparedness and response roles, readiness speaks to a state where a jurisdiction or local health entity is ready for whatever emergency comes next and has the capabilities to respond appropriately. When looking at emergency planning efforts, there is a need to reconfigure existing emergency plans with the readiness factor in mind and ask the following questions:

- Do our plans speak to social distancing, such as what we experienced during COVID-19?
- As we absorb the lessons of COVID-19 and the outsized role of the media, have our efforts regarding crisis communication been sufficient?
- Is there some sort of training/exercise for public health officials to engage in when mitigating the politicization of public health seen in the recent past?
- These elements of organizational readiness must, at minimum, be contemplated before moving forward.

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Food and Agriculture Sector Perspectives

By Aurelia Berisha, Isaac Dietrich, Ben Dinsmore, Bert Cramer, & Heather Allen




The U.S. Food and Agriculture (FA) Sector is composed of complex production, processing, and delivery systems that can feed people and animals both within and beyond the boundaries of the United States. Beyond domestic food production, the FA Sector also imports many ingredients and finished products, leading to a complex web of growers, processors, suppliers, transporters, distributors, and consumers. These food and agriculture systems are almost entirely under private ownership, operate in highly competitive global markets, strive to operate in harmony with the environment, and provide economic opportunities and improved quality of life for American citizens and others worldwide. Food, agriculture, and related industries contributed more than a trillion dollars to the gross domestic product in 2021 and accounted for nearly 11% of total employment, including around 2.6 million farm jobs and nearly 20 million jobs in food- and agriculture-related industries.

If using the Department of Homeland Security's (DHS) Infrastructure Data Taxonomy, this massive system critical to economies, public health and human culture would be described as being comprised of establishments primarily engaged in growing crops, raising animals, harvesting timber, fish, and other animals from a farm, ranch, or their natural habitats. Food establishments transform livestock and agricultural products into products for intermediate or final consumption.

What makes this sector critical to the nation, and what possible effects does it have on states and local communities?

The FA Sector underpins all aspects of U.S. society and national security interests. From large-scale commercial farms to local farm stands and farmer's markets, the FA Sector is essential to the U.S. economy and American way of life. The United States has highly productive agricultural systems, a vigorous private agribusiness sector, extensive FA infrastructure, and supportive public policies and institutions that contribute to a dependable, affordable, safe, and diverse food supply. A strong and secure FA Sector fortifies the nation's safety, prosperity, and well-being.

The federal government works with the private sector and state, local, tribal, and territorial (SLTT) partners to safeguard FA Sector production ability, technological advances, and global reputation for safety. All levels of government share responsibility for protecting access to food and preventing agricultural production shortfalls. During the Coronavirus COVID-19 pandemic, even minor disruptions to the supply chain and

availability of certain products left a profound mark on the consciousness of the American consumer. These disruptions highlighted what many agricultural producers already knew: how important it is to build more resiliency and security into the FA Sector. The lessons learned from the early days of the pandemic have spurred partners around the country in both the public and private sectors and at all levels of government into action to further strengthen the FA Sector.

What are this sector's key assets and interconnected/interdependent systems (physical or cyber)?

The FA Sector is highly interconnected with other critical infrastructure sectors. Trends or incidents in transportation, water, distribution, energy supplies, and labor, for example, can all have an impact on the FA Sector.

FA relies heavily on the security and resilience of U.S. supply chain and transportation systems. In fact, agriculture is the largest user of the freight transportation system in the United States, and the need for transportation services will only continue to increase as agricultural production, exports, incomes, trade, and world population grow. Beyond the freight system, waterways remain the United States' cleanest mode of domestic agriculture distribution – just one example of FA Sector water dependence.

Over the last few decades, the FA Sector has become increasingly reliant upon the use and development of technological and scientific advancements. Industrial farm machinery has grown beyond traditional tractor and plow practices. Large- and medium-scale farming operations now often rely on computer-assisted equipment, drones, imagery systems, and advanced irrigation systems for their day-to-day operations. More broadly, FA is also heavily influenced by research and development advancements which have been essential in the realization of stronger farm biosecurity, increased productivity, and continued competitive advantage in global markets.

From large-scale commercial farms to local farm stands and farmer's markets, the FA Sector is essential to the U.S. economy and American way of life.

Lastly, and most importantly, the FA Sector relies on the individuals who work every day to ensure that the sector is operational and productive. From family-run operations to large-scale farming to laboratory technicians developing stronger seeds, the people who are actively engaged in the FA Sector are its most important asset.

What are this sector's dependencies (physical, cyber, geographic, and logical) and interdependencies with other critical infrastructures?

FA constitutes a massive system of critical infrastructure that, by nature, is heavily reliant on the success of other critical infrastructures. Nearly every aspect of FA supports and is supported by the other 15 sectors designated by Presidential Policy Directive-21. Several examples of this include:

- *Chemical* – The development of fertilizers, pesticides, soil, water additives, feed, and much more that bolster the ability of producers to maintain stronger, more resilient systems is reliant on the Chemical Sector and its intersections with FA. Additionally, FA has relied on the Chemical Sector to ensure the continued availability of cleaning and sanitizing products used within food operations.
- *Commercial Facilities* – To obtain the food that Americans put on their tables, they usually rely on commercial facilities that hold, distribute, and sell food, water, and other agricultural products. This creates a heavy dependence on the Commercial Facilities Sector.
- *Critical Manufacturing* – Without many of the products manufactured in American facilities, the FA Sector would be unable to fulfill its demand or compete with the rest of the world. From even the smallest products like horseshoes to massive irrigation systems, FA is reliant on the ability of U.S. manufacturing to deliver daily.
- *Dams, Energy, and Water Systems* – As noted above, water is essential to the success of FA – and life, more generally. Not only does it function as a critical resource for the growth of FA products, but it also develops energy that FA facilities rely on. Waterways are used as a transportation method to move FA across the country and to ports for further international trade. Beyond water, energy is what moves the resources that produce FA. Nearly every level of the FA Sector depends on the availability of energy in the form of distilled fuel (i.e., gasoline, diesel), electricity, propane, natural gas, nuclear, and renewable fuels (including wind and solar energies).
- *Information Technology (IT)* – Like other sectors, FA has become increasingly reliant on the stability of IT systems. Satellite imagery, the global positioning system (GPS), and position, navigation, and timing technologies support programs aimed at improving agricultural and ecological practices and allowing farmers and other producers to make better use of their land and resources. Computers have become a part of the daily activities of both small- and large-scale agricultural producers, supporting the spread of best practices, as well as creating the ability to track and monitor production outcomes.

These examples are only a small part of the FA Sector's interaction and interdependence on other critical infrastructure sectors. According to USDA's National Agricultural Statistics Service (February 2022), there are 2,012,050 farms and ranches in the U.S. These operations use different methodologies and practices based on location, size, and production focus. This means that farmers, ranchers, and other producers interact with U.S. critical infrastructure in diverse and wide-ranging ways. All of which are incredibly important – especially at the local level.

What are this sector's current and emerging vulnerabilities, hazards, risks, and threats?

Since the FA Sector is interconnected and primarily composed of private and non-federal entities, a broad range of international and domestic threats could exploit vulnerabilities within this critical infrastructure sector. Motivation for threat actors who may be targeting FA range across the spectrum: economic/commercial exploitation, trade advantage, science and technology intellectual property theft, and violent extremist ideologies. Some notable vulnerabilities, hazards, and risks include:

- *Transportation* – As noted, the FA Sector largely depends on the transportation industry for the storage, distribution, trade, and exportation of food and agriculture products. However, existing bottlenecks and aging transportation infrastructure are no longer sufficient to support the current operational activities within the FA Sector. Additionally, many food and agriculture products have a short shelf-life. Therefore, if shipments are disrupted or delayed, there may be significant loss in the supply chain.
- *Labor* – Labor shortages are another significant hurdle that FA Sector and FA-dependent industries must overcome, as there are not sufficient workers to handle a growing demand due to low wages, difficult working conditions, inflexible schedules, and other factors. This vulnerability was especially exposed during the COVID-19 pandemic and ongoing pandemic recovery.
- *Chemical, biological, radiological, and nuclear (CBRN) threats* – CBRN threats can be any poisonous agent, toxin, pest, pathogen, nuclear, or radioactive material used to disrupt agriculture and livestock. The FA Sector is vulnerable to CBRN attacks, as the introduction of hazardous contaminants in FA systems can have grave consequences and lasting impacts on the security and stability of the nation. The threat of CBRN continues to grow as novel advances streamline and facilitate certain scientific procedures that previously hindered malicious actors from acquiring, weaponizing, and dispersing hazardous materials. Thus, the elimination of barriers to CBRN presents a continuous and emerging threat for critical infrastructure as the reality of malicious actors introducing an agent to FA systems is becoming more salient.
- *Cyber* – Due to the growing reliance on the Internet of Things, Industrial Control Systems, cyber systems, and infrastructure within the FA Sector, cyberattacks present a rising threat to FA. Some of the most common forms of cyber risk include malware, phishing, and ransomware. The FA Sector is not impervious to cyberattacks since most (if not all) of its industries and

those it relies on are heavily dependent on technology for the production, storage, distribution, and service of food.

- *Climate Risk* – The effects of climate change present a significant threat to the U.S. agricultural production and economy, as shifts in weather patterns and elevated climate temperatures increase the frequency of natural disasters (such as severe storms, floods, hurricanes, droughts, and wildfires). The increased trends in natural disasters pose long-lasting consequences to crop and livestock production, land use, and water quality and availability. Additionally, these climate change effects have also contributed to the increased spread of pests and invasive species that harm the ecosystem, water resources, biodiversity, and agricultural and forest production.

How would a human-caused, natural, or technological disaster impact this sector's preparedness, response, and recovery efforts?

National Security Memorandum-16 (NSM-16) was issued specifically to strengthen the security and resilience of United States food and agriculture. As noted in NSM-16, any human-caused, natural, or technological disaster can have major and long-lasting consequences for the FA Sector – especially if the nation is not equipped to manage such events.

The Harlequin Produce farm grows a wide variety of organic crops like these corn plants in Arlee, Montana (*Source:* USDA NRCS Montana, June 2019).

If a CBRN agent were released into agriculture products (whether deliberately or inadvertently), there would be major economic and social implications involved. The first response to a CBRN attack typically involves containment, decontamination, or depopulation within the impacted areas, which would affect the economy in three major ways. First, the implementation and execution of the response efforts require personnel and technical resources. Second, monetary aid would have to be distributed to compensate the affected stakeholders for any losses. Third, the contaminated products would not be exported, resulting in major trade loss for the nation. In addition to economic destabilization, the social implications of disasters and disaster response, like the stigma associated with the depopulation of livestock, are important impacts to consider as the range of disaster preparedness, response, and recovery is considered.

There are many processes in FA systems, so the sector uses robust access and control measures to prevent and mitigate the consequences of CBRN attacks. In addition, early warning systems are also vital to this sector as they provide situational awareness of potential threats that are circulating within a population. For example, the Food and Emergency Response Network is an integrated laboratory network that plays a central role in detecting threats and providing early warning to ensure food safety and defense.

Technological disasters are also becoming an increasing problem as the FA Sector heavily depends on IT for daily operational activities. For example, GPS technology is used for precision agriculture and for the transportation and distribution of food and agriculture products. Power outages, cyberattacks, or other technological disruptions have the potential to adversely impact the sector. The National Institute of Standards and Technology Cyber Security Framework provides standards and guidelines across the sector to ensure the detection and mitigation of cyberthreats.

Fortunately, USDA, which shares Sector Risk Management Agency duties and responsibilities with the Department of Health and Human Services for FA, also has significant experience in and resources for responding to, recovering from, and mitigating potential FA disasters and emergencies.

USDA serves as the coordinator for Emergency Support Function (ESF) #11, which provides the structure to facilitate federal support to states and federal-to-federal support during disasters and emergencies when agriculture and natural resources are impacted. This support helps feed people, ensure the safety of certain food products, address animal and agricultural health issues, and evaluate damage to natural and cultural resources and historic properties.

When it comes to hazards and risks, such as potential outbreaks of foreign animal diseases, USDA's Animal and Plant Health Inspection Service (APHIS) collaborates with stakeholders to conduct surveillance activities that provide key information on foreign and domestic animal diseases. APHIS laboratory services are carried out by the National

Veterinary Services Laboratories, which provide diagnostics and training services, support on-the-ground responses to animal health emergencies, participate in scientific associations, and serve as a global reference laboratory for 14 diseases.

It is also necessary to mitigate threats and not just respond once the worst happens in order to sustain the overall competitiveness of U.S. agriculture to maintain an abundant food supply for people and livestock, to support the farmers, ranchers, and workers who drive the FA Sector, and to sustain the vitality of rural communities, rural and urban agriculture infrastructure, and agricultural businesses. USDA's National Institute of Food and Agriculture supports the resilience of the FA Sector to biosecurity risks, and the many other risks already mentioned through the Food and Agriculture Defense Initiative Extension Disaster Education Network (FADI-EDEN) program.

This initiative is made up of three separate but critical networks. The first is EDEN, which expands the Cooperative Extension System's educational role with a focus on FA before, during, and after a disaster, using an "all-hazards" approach to enhance the nation's ability to manage domestic incidents.

The National Plant Diagnostic Network (NPDN) is focused on reducing the vulnerability of the United States food and agricultural system to chemical or biological attack. The network coordinates the development, implementation, and enhancement of diverse capabilities for addressing threats to the nation's agricultural economy and food supply. This network's main goal is to: produce educated and capable first responders, provide accurate, reliable, and timely diagnostics and surveillance, and supply useful, real-time data from innovative information and communication systems.

The third and final network in this program is the National Animal Health Laboratory Network. Like the NPDN, the goal of the network is to provide early detection, rapid response, and appropriate recovery support from an adverse animal health event. Its activities supporting disease identification and surveillance focus on identification of high-consequence pathogens, including those that are transboundary/foreign animal diseases endemic to the U.S. as well as newly emerging diseases.

NSM-16 also assigned key roles to USDA, HHS/FDA, DHS, and other federal partners in the ongoing effort to protect the FA Sector. Together they will continue to integrate FA Sector efforts to promote the security and resilience of the nation's critical infrastructure. Together, federal partners continue to look for how research and development (R&D) of current and new capabilities meant to enhance the security and resilience of the FA Sector can be accelerated and expanded.

What else do emergency preparedness, response, and recovery professionals need to know about this sector?

This sector is not only extremely complex and heterogeneous (e.g., consider the differences between a tilapia farm, a seasonal vegetable farm, and a range-based cattle

management operation), but it is also predominantly privately owned. A resilient FA Sector, therefore, largely depends on the overall involvement across private industry, SLTT governments, and other stakeholders. Integration and coordination within all levels of the FA community – not just at the federal government level – are essential to building more unified preparedness, response, and recovery efforts.

One of the single best things to do is to reach out and interact with EDEN. They not only offer a great network of extension specialists to interact with and learn from but can provide busy emergency managers with homeland security processes for disaster planning, preparing, mitigating, responding, and recovering in a FA context. These educational resources are available on their resource dashboard.

Increased interaction, communication, and information sharing across the sector are vital. They supply situational awareness during an emergency by identifying near-real-time vulnerabilities and threats that can bolster everyone's strategic planning. More specifically, they ease and enhance technical assistance and risk management activities that reduce the overall consequences of catastrophic events.

Ultimately, not all human-caused or natural disasters are the same. The varying degrees of impact associated with any given incident and the various FA equities it may or may not touch mean that preparedness, response, and recovery efforts will not (and should not) look the same in every disaster. There is no "one-size-fits-all" solution in FA. While that can be challenging when thinking about solutions for the sector in general, it also points to the importance of the inherent resilience that diverse and decentralized systems have. Any solution across the preparedness, response, and recovery spectrum that does not reinforce the already existing strengths of the sector is a solution that should be reconsidered.

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