World Fire Congress Communities of Practice Topic Abstracts — 2026 London Congress

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1. Climate-Driven Large-Scale Events: Response and Resilience

Fire services on every continent are confronting a transformed threat environment. Climate change is not a future problem — it is reshaping the fireground, the floodplain, and the storm-impact zone today, accelerating the frequency and severity of events that exceed the planning assumptions, resource capacities, and tactical doctrines of even the most well-resourced fire and rescue services.

Climate change is intensifying drought and fire-favorable weather conditions globally, lowering vegetation moisture and preconditioning landscapes to burn more regularly, intensely, and severely. During the 2024–2025 fire season alone, more than 100 million people were exposed to fire worldwide. No region is exempt: record fires in South Korea, Türkiye, Spain, and Portugal collectively burned more than 700,000 hectares and displaced tens of thousands of residents, while simultaneous crises unfolded across South America, Central Africa, and boreal Canada.

At the same time, warming oceans and a more energized atmosphere are driving an escalation in destructive storms and flooding. 2025 alone produced 138 tropical systems with 95 named storms, causing nearly 4,000 fatalities and roughly $49.3 billion in damage worldwide. Hurricane Melissa became one of the most intense Atlantic hurricanes ever recorded, making landfall in Jamaica with winds near 295 km/h — part of a season that saw three hurricanes reach Category 5, the first time that many Category 5 storms had occurred in a single season since 2005. The prior year was no less severe: the 2024 Atlantic season produced 18 named storms, 11 hurricanes, and 5 major hurricanes, causing 442 deaths and $131 billion in damage — the third-costliest Atlantic season on record, while the 2024 Pacific typhoon season brought between 1,336 and 1,502 fatalities and nearly $30 billion in damage. Munich Re

Flooding compounds this picture. The number of people globally exposed to flooding has risen steadily, from 28.1 million in 1970 to 35.1 million in 2020 — an increase of nearly 25 percent, and flash floods alone now cause more than 5,000 deaths and roughly $50 billion in global losses each year. Recent events illustrate the scale: 2024

floods across West and Central Africa killed more than 1,500 people and displaced over a million; flooding in Rio Grande do Sul, Brazil, marked the country's worst flooding in 80 years, affecting more than 1.4 million people; and Storm Boris triggered flash floods across central and eastern Europe in September 2024 that displaced tens of thousands, including river flooding in the Czech Republic statistically expected only once every 100 years. UNDRR Sustainability Global Worldvision UN NEWS

Fire, rescue, and civil defense personnel are consistently the first responders into these events — conducting swift-water rescue, structural collapse search and rescue, mass evacuation, and shelter operations — often while their own stations, apparatus, and personnel are directly affected by the same storm.

The challenge is not only one of suppression or rescue — it is one of systemic resilience across all hazards. How do fire and civil defense services build mutual aid architectures that cross borders and hazard types? How do communities prepare and adapt to compound and cascading events — where wildfire-scarred terrain amplifies flood and debris-flow risk, or where storm damage precedes a fire-weather event? What pre-positioning, early warning, and evacuation strategies are proving effective across different national contexts and hazard profiles?

This Community of Practice brings together fire, rescue, and civil defense leaders from across the globe to share hard-won lessons from recent catastrophic wildfire, storm, and flood events, compare response doctrines, and collectively advance the frameworks, investments, and international cooperation needed to meet the escalating demands of a climate-altered world.

UNDRR State of Wildfires ECMWF State of Wildfires Copernicus ESSD State of Wildfire

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2. Emerging Technology and Artificial Intelligence

Technology is transforming what is possible in fire and civil defense — but the pace of change is uneven, the risks are real, and the promise remains unevenly distributed across nations. From AI-powered early detection and satellite fire monitoring to autonomous apparatus, smart PPE, and decision-support tools for incident commanders, the potential of these technologies lies in their capacity to process and synthesize vast amounts of data in real time, providing actionable intelligence when seconds matter. AI is gaining momentum throughout nearly every industry, including fire and emergency services — yet adoption is advancing fastest in high-income nations with robust digital infrastructure, while many services worldwide lack even the

foundational connectivity required. Fire chiefs across the world are urging caution, recognizing that AI offers powerful tools but also carries risks if adopted without appropriate governance and human oversight. This Community of Practice exists precisely because no single nation has all the answers. It brings together fire service leaders, researchers, and practitioners to share what is working, identify what is not, explore the ethical and equity dimensions of technology adoption, and build shared frameworks that help all members — regardless of resource level — navigate the accelerating intersection of technology and fire service operations. CTIF Firehouse Trends Firehouse

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3. Data: The Foundation of Evidence-Driven Fire Services

Across the world, fire service decision-making — at the incident, department, and policy levels — is only as good as the data that informs it. Yet in most countries, fire data remains fragmented, inconsistently collected, difficult to compare, and rarely shared across jurisdictions or borders. There are many concerns and issues shared across countries and continents, but without common data standards, it is nearly impossible to know what solutions are actually working — or to measure progress against shared goals. The challenge is to develop modern architectures that enable consistent and timely data collection, introduce automation and analytics, and allow for the application of artificial intelligence to enhance analytic capacity. The gap is most acute in lower-resource settings: fire policy and mitigation strategies in poorer countries are constrained by inadequate data on incidence, impacts, and causes, primarily due to a lack of capacity and resources for data collection, analysis, and modeling. This Community of Practice convenes practitioners, researchers, and policymakers to explore shared approaches to fire data governance, interoperability across national systems, minimum viable data standards for resource-constrained environments, and the vision of a global fire intelligence ecosystem that serves every nation — not only those with the most advanced reporting infrastructure. UL Global DHS S&T NERIS PMC Improved Fire Risk Assessment

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4. Fire in Low- and Middle-Income Nations (LMICs)

Fire is one of the world's most inequitable killers. It is estimated that more than 150,000 people die from fires or burn-related injuries every year, and over 95% of those deaths and burn injuries occur in low- and middle-income countries. Death rates in LMICs are nearly six times higher than in high-income countries, driven by a combination of dense

informal settlements, combustible construction materials, open-flame cooking, unreliable electricity, and severely under-resourced fire and rescue services. Urban fires in LMICs are an everyday disaster — and fire outcomes are consistently worse for those of lower socioeconomic status wherever they live, reflected in greater fatalities, permanent disabilities, and damage to livelihoods with long-term consequences for community development. This is not a problem that high-income nations observe from a distance: it is a shared global failure, and a shared global responsibility. This Community of Practice centers the voices, experience, and leadership of fire service practitioners and researchers from LMICs, while engaging the full breadth of the WFC membership in honest conversation about capacity building, technology transfer, community-based fire risk reduction, informal settlement safety, and how the global fire community can work in genuine partnership — not charity — to close the gap between where fire risk is highest and where fire service investment is lowest. UNDRR PMC Improved Fire Risk Assessment IFSC

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5. Firefighting: Tactics and Training

The nature of fire is changing faster than the doctrines and training curricula designed to fight it. Around the world, fire services are confronting a widening gap between the environments their personnel train for and the incidents they are increasingly called to face. When fires spread into dense communities at the wildland-urban interface, burning structures become the primary fuel — increasing fire intensity and making suppression exponentially more difficult — yet traditional wildland training focuses on remote fire behavior while structural training only briefly addresses vegetation fires. Beyond the WUI, fire services globally face mounting complexity across multiple fronts: lithium-ion battery fires, high-rise and informal structure fires, industrial and chemical hazard response, mass casualty incidents, and large-scale flood and disaster co-response. Tactics that are standard practice in one nation may be unknown in another — and innovations developed in one context may be directly transferable to fire services facing similar challenges on the other side of the world. The knowledge exchange of delegates is key: fire service leaders need to know what solutions other nations are using for common challenges. This Community of Practice creates the space for that exchange — bringing together operational leaders, trainers, and researchers to compare doctrine, share lessons learned from significant incidents, explore simulation and technology-enhanced training, and build toward shared standards that elevate the effectiveness and safety of firefighters everywhere. UL FSRI Training Academy UL WUI Fire Rescue 1 WFC

6. Firefighter Health and Safety

The people who serve in fire and rescue services face occupational health risks that are among the most serious of any profession — yet the nature and severity of those risks vary significantly across the globe, and the research, policy, and cultural responses have been deeply uneven. In higher-income nations, occupational cancer has emerged as the leading cause of line-of-duty death, with approximately 75% of IAFF line-of-duty deaths in 2024 attributed to cancer, driven by toxic combustion byproduct exposure and chemical contamination in PPE. Thermal stress, emotional stress, and occupational injuries are recorded across fire services globally, and the relationship between depression, PTSD, and excess alcohol consumption in firefighters is well established as a compounding factor in workplace accidents and long-term health deterioration. In many parts of the world, however, the most pressing health and safety concerns are more foundational: lack of basic personal protective equipment, extreme heat conditions without adequate rehabilitation protocols, road crash risk during emergency response, infectious disease exposure, and the absence of any formal occupational health monitoring system. The importance of international cooperation in safeguarding first responders and the communities they serve has been underscored at the highest levels of the WFC. This Community of Practice brings together the full spectrum of global fire service experience to build shared knowledge, compare evidence-based interventions, and advocate for a universal standard of care — because the protection of those who protect others should not depend on the country in which they serve. IFSJ NIH

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7. Women in the Fire Service

Women remain dramatically underrepresented in fire and civil defense services worldwide — yet the global picture is far from uniform, and the variations across nations offer some of the most valuable lessons this Community of Practice can explore. In some countries, women lead national fire agencies and comprise a meaningful share of the operational workforce; in others, female participation remains near zero. In the United States, female firefighters currently comprise just 4–5% of the career workforce, a figure that has grown only slowly over four decades despite the removal of formal barriers. Globally, the obstacles are structural, cultural, and practical: physical testing designed without female physiology in mind, personal protective clothing that fits poorly for approximately 80% of female firefighters, workplace cultures that have yet to fully welcome women, and limited pathways to leadership. At the same time, globally, about

57% of volunteer work is performed by women — a clear signal that the barriers are not about willingness or capability. Expanding workforce capacity and effectiveness in the face of a growing fire crisis will require increased investment in more equitably supporting all firefighters, and recruitment and retention challenges specific to women and other underrepresented groups have too often been overlooked. This Community of Practice convenes fire service leaders from diverse national contexts to share what is working — in recruitment, retention, equipment design, culture change, leadership development, and policy — with the shared conviction that a fire service that reflects the communities it protects is a more capable, more trusted, and more resilient one.
Minneapolis Government R&D Science Daily NVFC