



Wildfire Technology Management

FIGHTING WILDFIRE TODAY:
what are the emerging risks, challenges and
needs in contemporary wildfire management?



INTERVIEW WITH

Professor Johann Georg Goldammer
Chief, Global Fire Monitoring Center (GFMC)



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Johann Georg Goldammer is Chief of the Global Fire Monitoring Center (GFMC), which he founded in 1998. Based at Freiburg University and Max Planck Institute for Chemistry, the GFMC has worked with the United Nations family, multilateral and intergovernmental organizations and directly with more than 70 countries in supporting scientific-technical and policy advice for developing capacities and policies in landscape fire management. Currently, the GFMC is a member of the Science and Technology Partnership of the

United Nations International Strategy for Disaster Reduction (UNISDR), coordinator the UNISDR Wildland Fire Advisory Group (WFAG) and provider of a Voluntary Commitment for the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. At regional European level, the GFMC is serving as a Specialized Euro-Mediterranean Centre under the European and Mediterranean Major Hazards Agreement and supports the Wildfire Disaster Risk Reduction agenda of the Organization for Security and

Cooperation in Europe (OSCE). As coordinator of the Global Wildland Fire Network, he has established eight Regional Fire Monitoring / Fire Management Resource Centers throughout the continents. The mission of the global network and their regional centers is to provide advisory support to countries and international organizations towards developing policies and capacities in Integrated Landscape Fire Management.



In your opinion, what are currently the major challenges in mitigating and preventing wildfires?

The overarching challenge is – [global change](#). Under the impression of the accelerating climate crisis, we have very much focused our attention on climate change as a driver of wildfires globally. This is offering a convenient excuse, because indeed, an individual, an agency or a single government – or all of us collectively – cannot halt climate change. Thus nobody is feeling responsible for what has happened in the past and accumulated since the beginning of the industrial revolution.

However, meanwhile eight billion people on Earth continue impacting our natural and cultural landscapes – providing the ground for drought-and-heat-fueled wildfires. If we want to mitigate the situation in future and prevent wildfires, we need to take care of our landscapes. Making them resilient against drought, heat and wildfires – this is the challenge of land use in a new, unprecedented era of our planet. Using land for the benefit of society, protecting the shallow soil cover, respecting biodiversity – wildfire-proof landscape and land-use design will be a prime and demanding challenge for this and the next generation. Time is ticking!

In terms of regional, national, and international cooperation, what trends have you identified during your time at GFMC? What challenges persist and what options are there to tackle them?

Before the establishment of the [GFMC](#) in 1998, a quarter of a Century ago, its predecessor institute – the Fire Ecology Research Group – had

focused on the [human and the social sides of fire](#). Ancestral and indigenous communities had developed a sense of cooperation in protecting their communities. Over the last century and more, we have seen that top-down approaches in fire management were less cooperative. Rules and commands coming out of vertically structured hierarchies of administrations – organized like silos made of steel or concrete – are repellents of communication or exchange. This has hindered hearing the voices of, and including the affected.

Breaking the silos and developing a horizontal, transversal approach in addressing the complex demands on landscape fire management, we need to observe the triple C – Coherence, Cohesiveness and Cooperation – and the triple I – Integration, Inclusion and Innovation. A model of governance in landscape fire management is coming up at international level. In May 2023, at the [8th International Wildland Fire Conference](#) to be hosted by Portugal, the proposed concept of the [International Landscape Fire Risk Governance Framework – Guiding Principles for Adjusting Strategies, Policies and Management to Global Change](#) will soon be circulated and call for discussion and approval.

If one wanted an example of best practice in terms of cooperation at different levels in fighting fires, what examples should be studied? Are there examples that come to mind for “lessons learned”?

Let me look at it from the European perspective. We are recognizing that the top-down approaches, prevailingly accompanied by high-tech firefighting solutions, cannot solve the problems on the ground.

The lesson identified: We are running behind the problem instead of positioning us in front of the problem.

The lesson learned: We have not yet succeeded solving the problem.

In order to be able to do so, we should have a look at the Global South, where community-based fire management approaches, along with principles of integrated fire management, have empowered local society to live with fire. The Global North should consider these experiences. Fighting wildfires must not only rely on the fire services. When they are called it is often too late. The active participation of civil society is imperative. Ten years ago, the GFMC and partners have developed the Guidelines [Defense of Villages, Farms and Other Rural Assets against Wildfires: Guidelines for Rural Populations, Local Communities and Municipality Leaders](#), meanwhile available for several cultural regions of Europe. These guidelines go along with the [EuroFire Competency Standards for Fire Management](#), which had been developed for Europe but are now available and used globally in 22 languages. We recognize that local actors are the ones who want to be and should become part of fire management including firefighting. We need to provide the legal and financial means towards realizing this approach.

With climate change accelerating and wildfires expected to get worse, what are the critical areas that require investment for better coordination between regional and national fire management actors and why?

Here I would like to refer again to the concept of the International Landscape

Fire Risk Governance Framework – Guiding Principles for Adjusting Strategies, Policies and Management to Global Change, which is currently being reviewed by international organizations and government agencies throughout the world.

Technically, for instance in case of aerial firefighting, we are still lacking consent or internationally agreed rules on how to safely, effectively and efficiently organize international cooperation. The [International Fire Aviation Guidelines](#) and the [International Manual for Use of Fire Aviation](#), which have been drafted several years ago, are still dormant as borders of jurisdictions are impediment.

How would you describe the current relationship between fire services and the industry? Are there any primary areas that need to be improved? Have there been any technologies, either being developed or fielded, that have caught your attention for their potential?

Again, let me give an example from Central Europe where up to recently wildfires have not yet been a major issue. Traditional fire services, well prepared, trained and equipped for fighting urban and industrial fires, are now becoming exposed to new

challenges – fighting landscape fires – virtually a new terrain for most services. Unlike in North America, Central / Northern European, the fire services have not grown up with wildfires. Within a relative short time period of half a decade – the onset of extreme droughts and wildfires began in summer 2018 – the services needed to orientate and identify solutions. Fortunately, a rather careful process, despite being a little slow, allows orientation and is furthering creativity. We are experiencing trials and errors – but also identify solutions. A striking example is a development in the Freiburg Landscape Fire Cluster in Southwest Germany. After the development of the “Freiburg Model of Landscape Fire Management”, a partnership of agencies and stakeholders of the city of Freiburg, a consultative process with industry was initiated in 2019. The goal of the consultative could be implemented and introduced to the market in 2022: An innovative, [multi-purpose firefighting kit](#) – available with water tanks of up to 1600 liters (420 US gallons) and foam mixer. Within less than 2 minutes, the unit can be attached to any [three-point hitch](#) – a standard of ten thousands of agricultural and forestry tractors. These tractors can be transformed into a highly maneuverable fire engine for the use in extreme off-road conditions – the [Welte tank bag \(WTR\)](#). Outside the fire season, the high- and

low-pressure system for firefighting can be used for cleaning communal assets, or switched to low-pressure for watering plants. This versatile unit stands symbolically for an integrated technological approach in fire management – for the year-round use including wildfire defense.

One of the main purposes of the Wildfire Technology Management conference is to better the communication between the services and industry. If you had to give one message to the industry delegates attending and sponsoring what would it be?

Think big and small at the same time. Innovative technologies should be designed for a wide use – besides the services also for the use at local community level. Volunteers, local wildfire defense teams, farmers and foresters should benefit from your innovations. Easy to handle, low risk, effective and efficient, especially concerning the scarcest element of firefighting – water!





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