Munich Wildfire Round Table
Munich, Germany, 18 March 2026

Integrated Fire Management

Interoperability from Local to Global

Johann Georg Goldammer

The Global Fire Monitoring Center (GFMC)

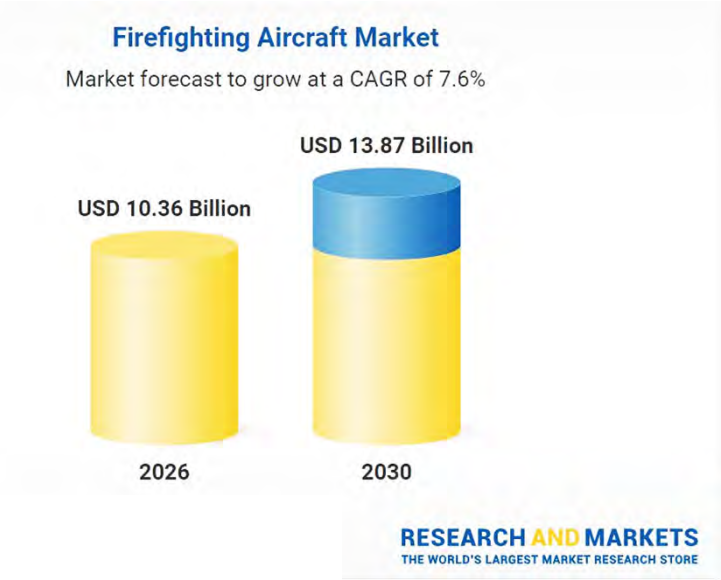
Interoperability in Fire Management – A multi-stage concept towards building an "International Regime"

- **Proto regimes** (domestic and cross-boundary)
  - Networking among scientists
  - Networking among practitioners
  - Networking of both with state authorities

- **An international regime**
  - A set of implicit or explicit principles, norms, rules, and decision-making procedures
  - that international actors expectations converge around in a given area of international relations

The Business – Views from the Air





Reality – Views to the Ground



Greece 2025



IR Iran 2025

Reality – Views from the Ground to the Air

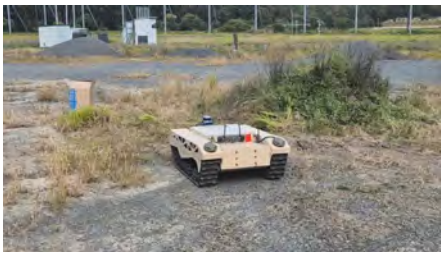


IR Iran – January 2026

Firefighting by Mouseclick

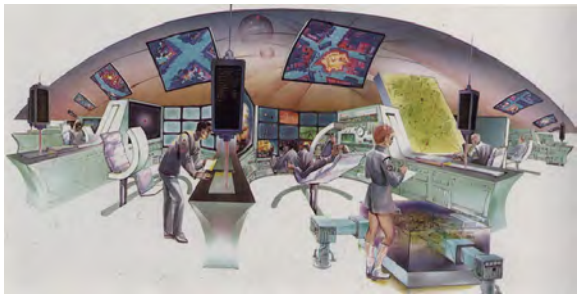








Firefighting by Mouseclick





Current trend:

Focus on Technologies and Artificial Intelligence



© Ernst Achilles



Regions of the Global Wildland Fire Network and the Regional Hubs
Eurasia – Eastern Europe – Southeast Europe / Caucasus – Euro-Alpine – Mediterranean – Near East
Central Asia – South Asia – Southeast Asia – Northeast Asia – Australasia – Subsahara Africa (Eastern Africa & Western Africa) – North America – South America – Mesoamerica and Caribbean

History of Regional Cooperation in Fire Management: The Regional South America Network (I)

- **Foundation** of the Regional South America Wildland Fire Network **22 years ago**: June 2004 (Curitiba, Brazil)
- **Chair**: Brazil
- **Initiation of regional exchange** between scientists, practitioners and policy makers





History of Regional Cooperation in Fire Management: The Regional South America Network (II)

- Inter-regional cooperation with the Central American and Caribbean Networks
- Inter-regional cooperation with African countries: Research and practical exchanges in Integrated Fire Management (Brazil) (12-14 March 2012)



Landscape Fire Ecology of Central Brazil
First Modern Cerrado Jalapão Fire Expedition – 2013



In recognition of the need to enhance preparedness and interoperability of South American countries for wildfire emergency situations

- **First Regional Consultation on Cross-boundary Fire Management (Republic of Uruguay, May 2016)**

  - Participating countries: Argentina, Brazil, Chile, Paraguay, Uruguay







EuroFire

International competency standards for training of firefighters

EuroFire

March 2026:

Available in 23 languages
for the use in 137 countries

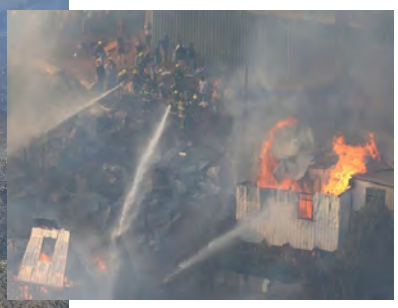
https://gfmc.online/eurofire/index-11.html



Chile Wildfire Emergency
- January / February 2017 -

- International efforts and engagement to bring the wildfires under control







International Fire Emergency Assistance







Compliance with the Rules of International Cooperation

- Confusion surrounds the arrival of volunteer firefighters outside of protocol (emergency tourism)
- Late arrival of the main contingents



Follow-up (I)

3-4 October 2017: Regional Consultation on Transboundary Cooperation in Fire Management

- Nine South American Countries attending with representation at high level



With support from
Federal Ministry of Food and Agriculture
by decision of the German Bundestag

Follow-up (II)

3-4 October 2017: Regional Consultation on Transboundary Cooperation in Fire Management

- Viña del Mar Declaration
- Official document that shall be endorsed and followed up by all South American countries
- Initiation of the formal dialogue between government agencies in 10 South American countries



Mr. Aaron Cavieres, Head of CONAF, Announcing the Declaration

Follow-up (III)

Consultation "Interoperability, cooperation, and mutual assistance for preparedness and response to wildfires in Latin America and the Caribbean"
9-13 March 2026, Brasilia, Brazil

- Member States of the Amazon Cooperation Treaty Organization (ACTO)
- Members of voluntary cooperation mechanisms, e.g. Red Amazónica de Manejo Integral del Fuego (RAMIF) and the Grupo de Expertos en Fuegos Forestales de Latinoamérica y el Caribe (GEFF-LAC)
- Global Fire Management Hub



Global Fire Management Hub ("Fire Hub")

- Established in 2023; Secretariat housed at UN FAO
- **Multi-partner initiative** to bring together countries, regional bodies, international organizations, non-governmental organizations, Indigenous and local knowledge holders, and private sector
- Focused on working with **countries, communities and others** who want to strengthen their capacities in **Integrated Fire Management (IFM)**

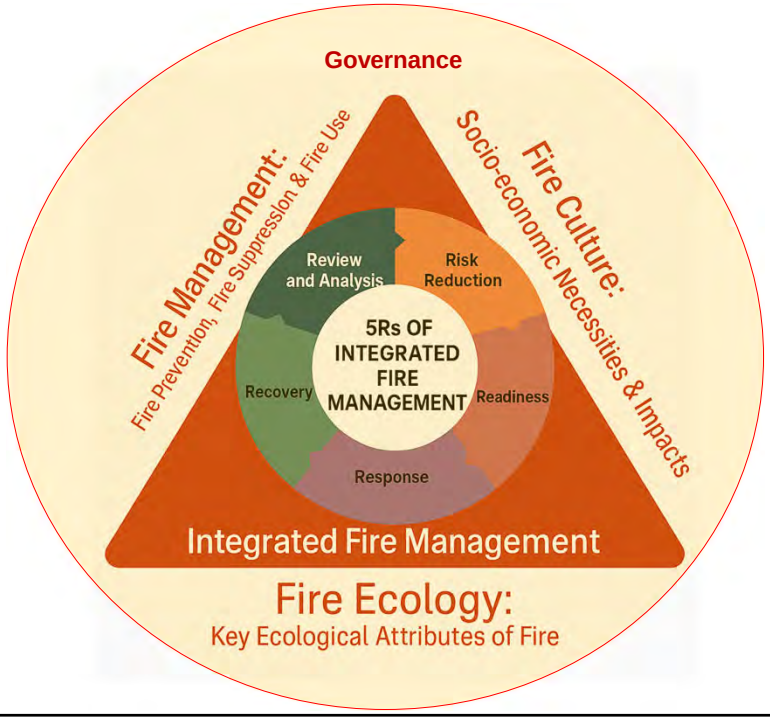
Fire Hub Purpose

Paradigm shift

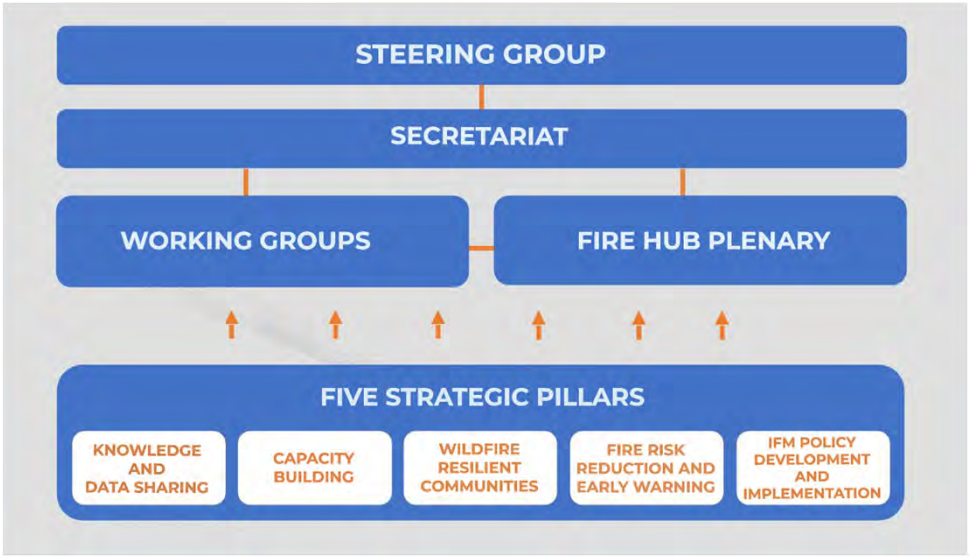
From :
Focus on reactive responses

To :
Proactive measures





Fire Hub Structure



Global Fire Management Hub

STEERING GROUP:

Food and Agriculture Organization of the United Nations

UN environment programme

The Global Fire Monitoring Center (GFMC)

Indigenous representative

International Liaison Committee (ILC)

Fire Hub

Three initial Working Groups…..

Fire Data



- Participants: 28 Core, 102 Total
- First meeting: 20 October, Bali
- 3 Co-Chairs
- Core Thematic Areas:
  - Data Needs and Standards
  - User Needs and Capacity Building
  - Best Practises and Knowledge Products
  - Innovation and Tools

Interoperability



- Participants: 24 Core, 70 Total
- First Meeting: 7-8 October, Freiburg
- 3 Co-Chairs
- Core Thematic Areas:
  - Command and Control Structures
  - Operating Plans and Agreements
  - Crosswalks, Competencies, and Positions
  - Liaison Officers (INLO)
  - Briefing Packages

CBFiM



- Participants: 102 Total
- Working with RECOFTC, Tropenbos Intl, and TNC to finalise Core Group
- Connection to International Indigenous-led Fire Adaptation Network

Coordination between Working Groups

Fire Hub
Working Group on International Interoperability

Purpose

To advance international interoperability in wildfire preparedness, readiness, and response and facilitate exchange of resources and communications by identifying existing frameworks, mapping commonalities and gaps, and developing voluntary, harmonized guidance and tools.

- aiming for *harmonization*
- fully respecting national and local procedures and operational frameworks

Fire Hub
Working Group on International Interoperability

- Core Group of 24
- Extended Community Reference Group of 70 – representing
  - Nations, international organizations, multilateral / regional organizations; individual experts
- Co-chairs: Gobal Fire Monitoring Center (GFMC)
  Canadian Interagency Forest Fire Centre (CIFFC)
  Australasian Fire Authorities Council (AFAC)
- First meeting of the **Core** Group: October 2025 Freiburg, Germany

Fire Hub
Working Group on International Interoperability

Priority topics:

1. Command and Control Structures (Operational Practices)
2. Agreements and Operating Plans
3. Crosswalk (bridging) – Competencies and Positions
4. International Liaison Officers (INLOs): Role, Benefits, Responsibilities
5. Briefing Packages

➢ Considering recommending a dedicated sub-group on **aviation**…..building on the existing IFAWG https://ifawg.net/]

The International Fire Aviation Working Group (IFAWG)

Mission Statement

Identify and facilitate opportunities for multilateral communication and cooperation to improve the safety, efficiency and effectiveness of aerial fire management.

Starting 2007

Development of the International Fire Aviation Guidelines: Application and further development

https://www.ifawg.net/



A possible starting point for the development consent-based guidelines for international cooperation

- The Global Fire Management Hub provides an opportunity to operationalize the International Fire Aviation Guidelines:





Challenges

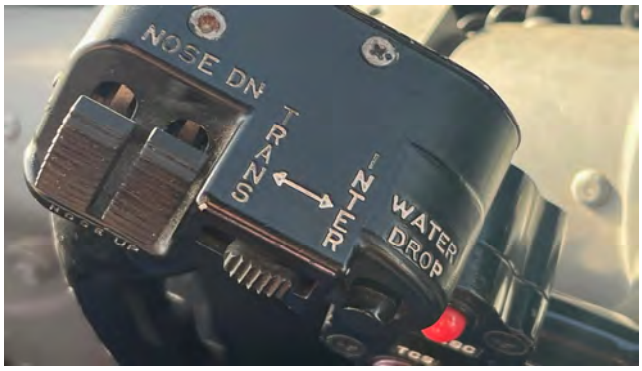
- Interlocutors (agencies, operators, military, etc.)
- SOPs
- Strategies / Tactics

Actions

- Multilateral agreements among operators

Perspectives

- Pre-deployments of assets according to long term risk indexes
- Increased safety, effectiveness, efficiency, for a seamless interoperability



Canada 2025: Wildfires and Domestic vs. International Mobilizations

Fires: 5,635

Hectares Burned: 8,920,807

Domestic

2,115 personnel

- 284 T1 IA firefighters
- 1,161 T1 EA firefighters
- 348 T2 firefighters
- 182 OH
- 128 IMT1
- 12 IMT2

~29,610 person days

International

1,596 personnel

- 1,279 T1 EA firefighters
- 204 overhead
- 113 IMT1

~44,120 person days

National Issues:
Cross-sectoral Dimension of Fire Management

Fires are burning across the jurisdictional & sectoral responsibilities of land owners and land management agencies:

Typically responsible agencies

- Natural ecosystems: Forests and other protected areas
- Agricultural and pasture lands
- Farms, villages and suburbs
- Infrastructures (incl. critical infrastructures), traffic
- Waste deposits and otherwise contaminated lands
- Military terrain

- Forest Service
- Park Service
- Ministry of Agriculture
- Ministry of Interior
- Crisis Management
- Ministries for Public Health and Environment
- Ministry for Defense

Case of Greece

- On 23 August 2018: Establishment of an Independent Committee tasked to **Analyze the Underlying Causes and Explore the Perspectives for the Future Management of Landscape Fires in Greece**
- Working with >70 experts and 28 agencies of Greece
- Report for reorganizing fire management in Greece (submitted to the Government and the Hellenic Parliament in February 2019)





Bidirectional Approach in Support of the Development of National Fire Management Policies:

Pragmatic Exchange at the Science-Policy-Practitioners-Interface (SPPI)

- „Top Down Approach“ through national policy dialogue & inter-agency coordination based on scientific evidence
- “Bottom-up Approach” by learning from and capacitating local rural communities: Collecting and disseminating experience in Integrated Fire Management





Key Recommendation

- Establishment of a **Landscape Fire Management Organization (LFMO)**, which shall
  - operate in a supervisory and co-operative manner with the multiple stakeholders involved in landscape fire management is proposed as a core element of a future reform
  - have an advisory, coordinative and supervisory role in landscape fire management in the country
  - develop an interagency National, Landscape Fire Management Plan and to monitor and follow up its application.

Principles of the proposed Landscape Fire Management Organization (LFMO) (I)

1. Transdisciplinary and Innovation

Policy and strategic planning and relevant decision making shall be based on sound scientific knowledge and considering technological capabilities and innovation; this will include considering the revival of traditional, socio-economically sound and environmentally benign land-use practices. A multi-disciplinary scientific approach is mandatory to address the cross-sectoral nature of fire management at landscape level.

2. Holisticness, Integration and Inclusion

Policy development and strategic planning shall be holistic, i.e. address the fire problem at landscape level by including all relevant institutional mandates and the potential and capacity of contribution of the civil society.

Principles of the proposed Landscape Fire Management Organization (LFMO) (II)

3. Coherence

The mandates and activities in fire management of State institutions and other stakeholders shall be coherent (harmonized) and meet the overarching national fire management policy and implementation plan.

4. Cohesiveness and Coordination

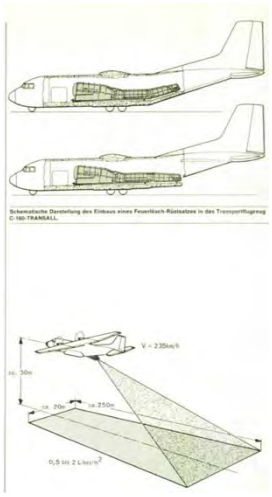
The National Fire Management Plan shall be considered cohesive (obligatory) for individual institutional / sectoral planning and activities and coordinated by LFMO.

Results

- Political changes after national elections in 2019 halted the implementation

Interoperability – Requiring institutional memories

Memory lost – the MBB Firefighting Kit for Transall C-160 (1980)



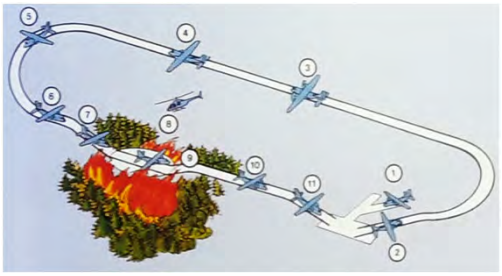




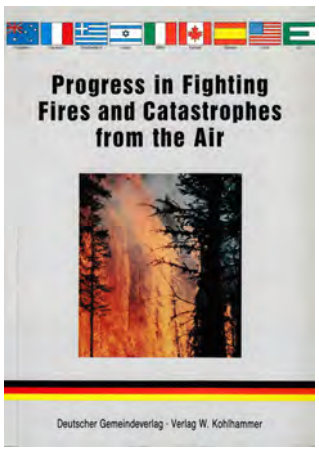


Interoperability – Requiring institutional memories

Scientific-technical developments and exchange (1980-1983)







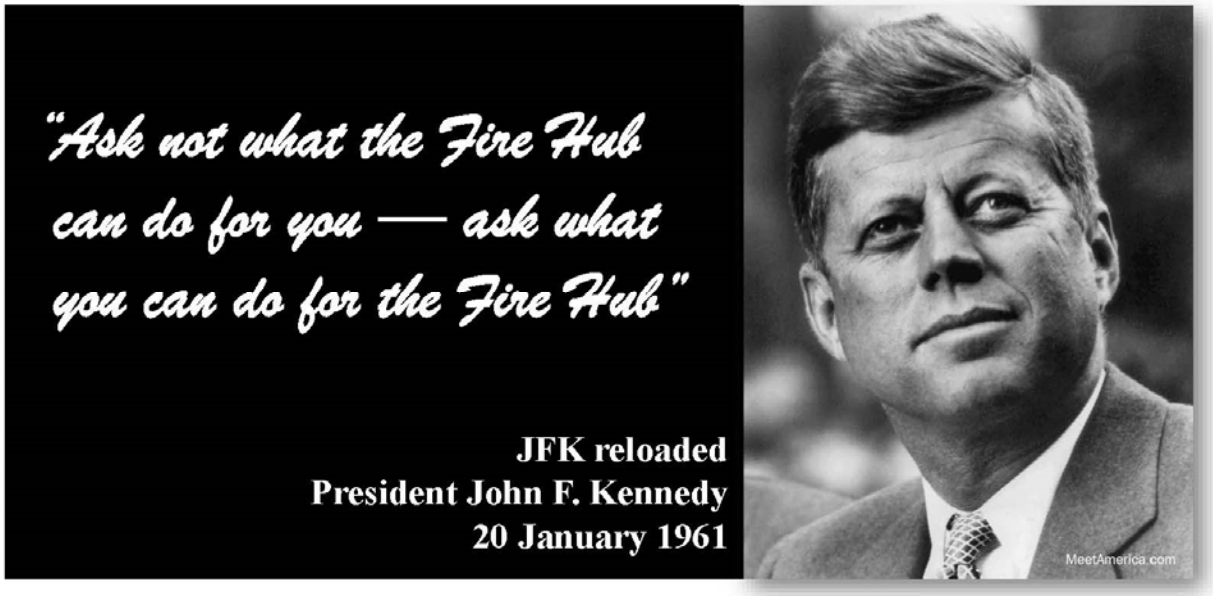
Conclusions (I)

- Bottom-up networking and creation of academic centers of excellence – predominantly initiated by the scientific community and civil society initiatives – have proven successful to create sustainable structures, especially when involving academic institutions that are independent of political-administrative changes
- At national level, the impact of these non-government initiatives is often limited due to lack of interest of state authorities

Conclusions (II)

- International organizations are benefitting of advisory support by Regional Networks and Regional Fire Management Resource Centers
- For the creation of interoperability in Integrated Landscape Fire Management, the value / utility of long-term sustainable scientific-technical knowledge holders and expertise of civil society organizations – including traditional / Indigenous Communities – has been recognized
- Joining hands with the support of the Global Fire Management Hub will be essential





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Thanks for Your Attention

The Global Fire Monitoring Center (GFMC)