



SEMINARIO INTERNACIONAL
PLANIFICACIÓN Y PREVENCIÓN DE
INCENDIOS DE PAISAJE Y EL ROL DE LA
RESTAURACIÓN POST INCENDIOS

Santiago, Chile, 20 y 21 de junio 2019



Chile
en marcha



Fires and Fire Management in Changing Global Landscapes

Visions of the Global Fire Monitoring Center (GFMC)

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Global Fire Monitoring Center (GFMC)
Freiburg, Germany



The Global Fire Monitoring Center (GFMC)



Supported by:



Federal Ministry for the
Environment, Nature Conservation,
Building and Nuclear Safety

based on a decision of the German Bundestag



Overview

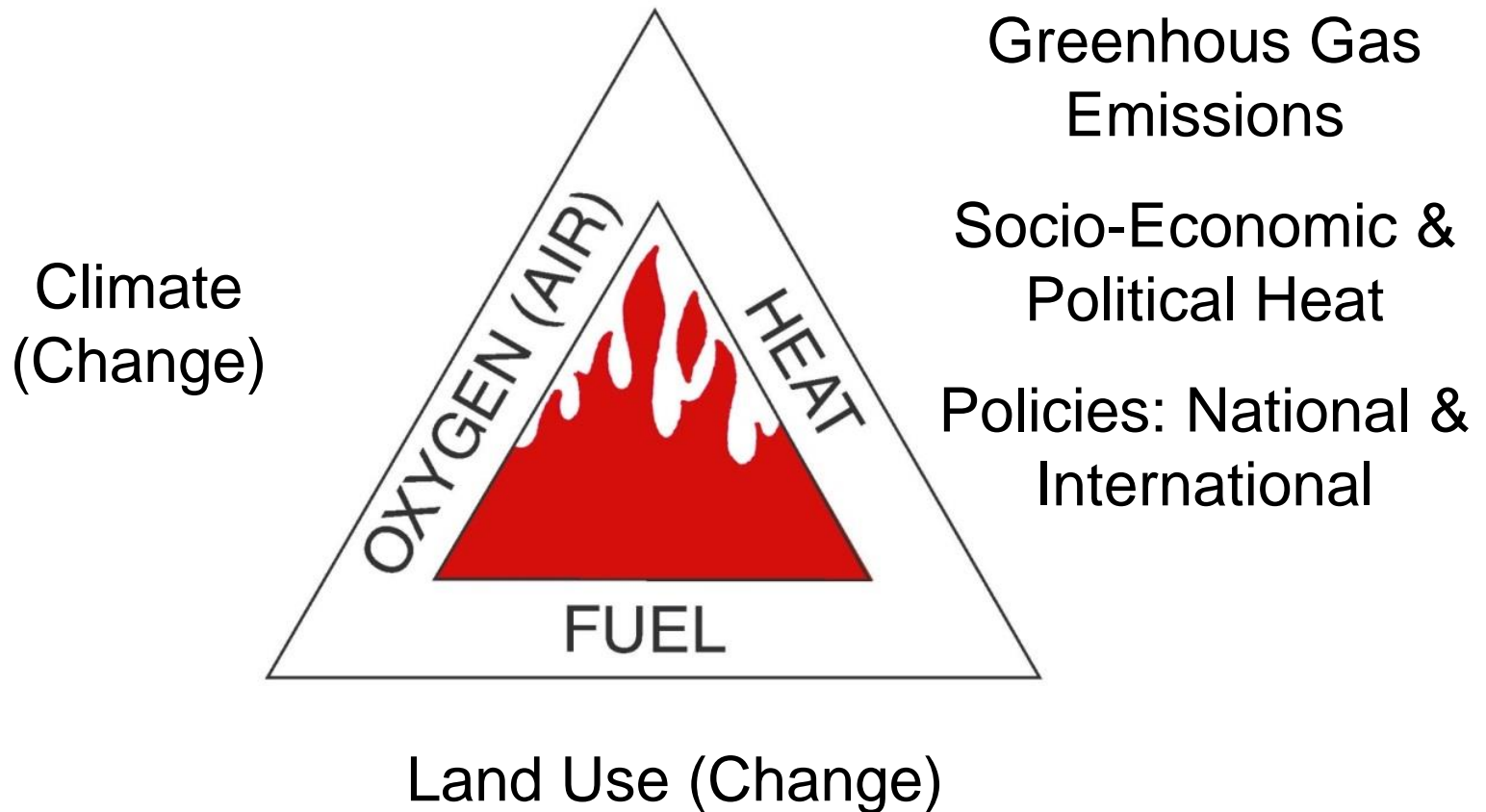
- Remarks from Europe
- Transboundary Impacts of Fires
- Holistic approaches in fire management
- South America's experience

The Traditional Fire Triangle



The Landscape Fire Triangle

Determining Factors in a Changing Global Environment



Example Europe – Contemporary Landscapes (I)

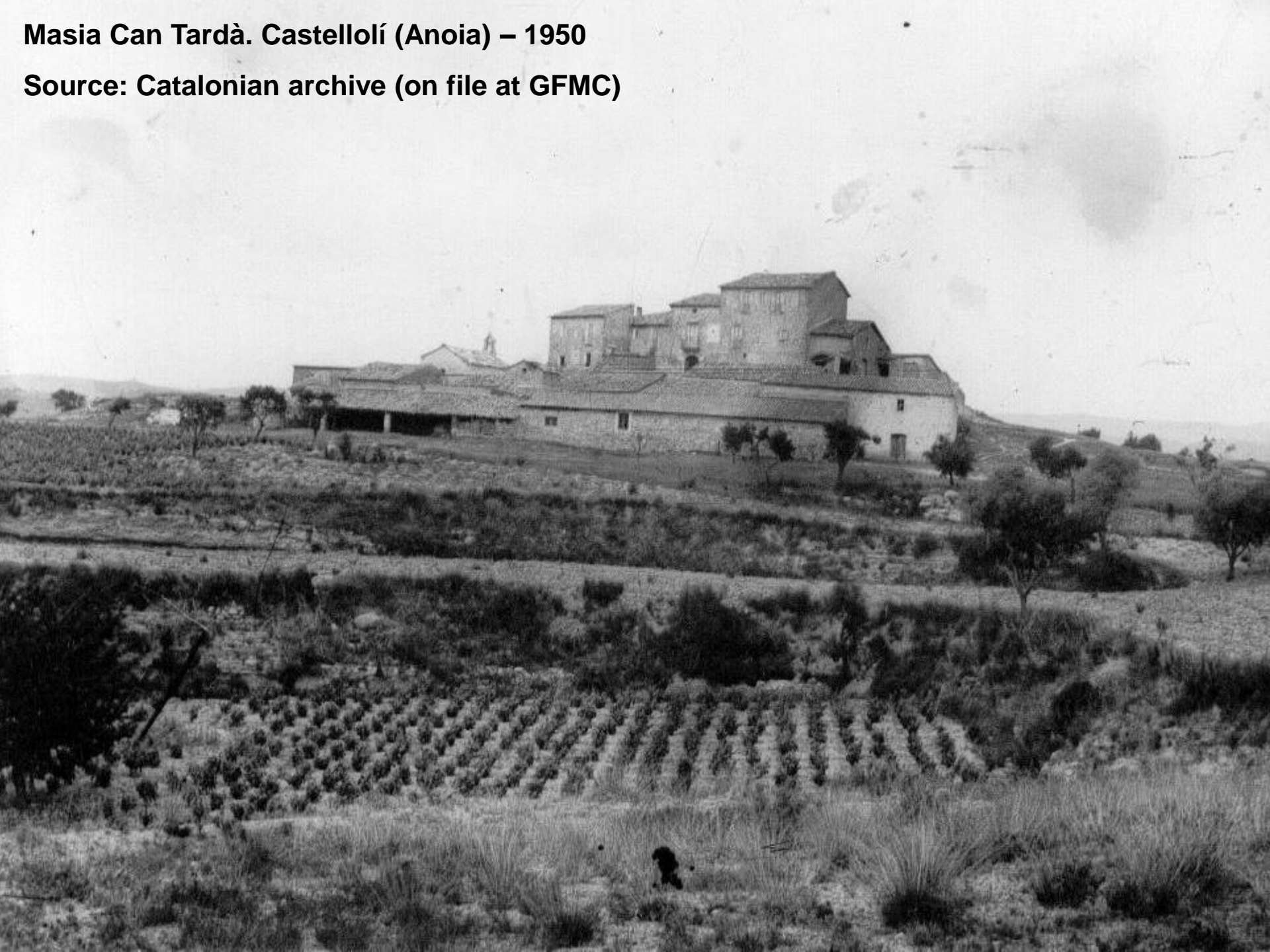
In most countries of Europe landscape fire regimes are changing due to

- Land-use change – associated with rural exodus and abandonment of the rural space
- Consequently, reduced land cultivation resulting in increasing flammability of rural landscapes



Masia Can Tardà. Castellolí (Anoia) – 1950

Source: Catalanian archive (on file at GFMC)



Masia Can Tardà. Castellolí (Anoia) – 2001

Source: Catalanian archive (on file at GFMC)



Western Balkans: Republic of North Macedonia

Abandoned pasture under succession



Greece: Abandoned vs. Cultivated olive orchards



Contemporary European Landscapes (II)

Landscape fire regimes are changing due to

- Weather extremes – consequence of climate change:
Increasing severity and duration of droughts

Wildfire impacts are increasing due to

- Increasing vulnerability of society to fires affecting
rural and peri-urban settlements





Mati / Greece – 23 July 2018



Mati / Greece – 23 July 2018





Burned houses (destroyed or damaged): 3000







Abandonment of rural villages in Russia

2010: 3000 villages



1991-2009

27 million ha of agricultural land abandoned and subjected to fallow



Same trend in the Euro-Mediterranean Region



Transbaikal Region: Chita Oblast April 2019



Cross-sectoral dimension of fire management (I)

Wildfires and land-use fires affect the intermix of natural and cultural landscapes

- 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



Cross-sectoral dimension of fire management (III)

Fires are burning across the 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**

Prevailing in countries of Eastern Europe, Southeast Europe, Caucasus and Central Asia:

Legal / technical vacuum for managing agricultural fires

Settlements

Agricultural
Lands

Forest

Vacuum

Fire Services



Forest Services





M4

R10

Image © 2012 GeoEye

Image © 2012 TerraMetrics

© 2012 Google

© 2009 Google

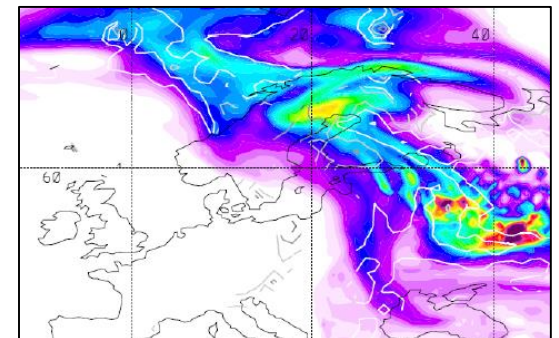
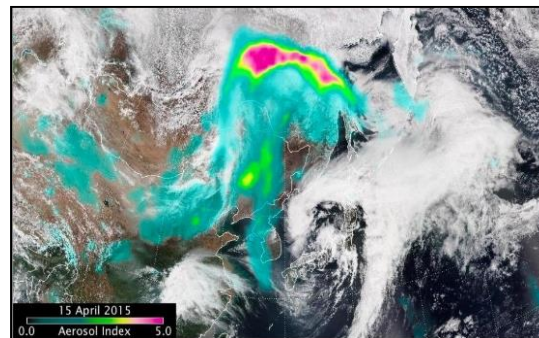
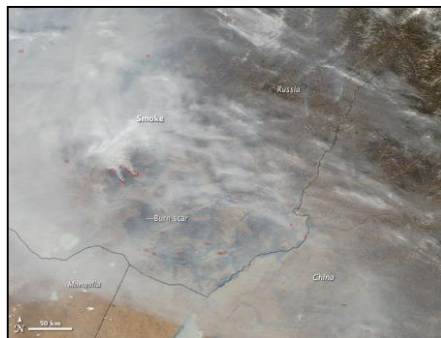
hmedatum: 20. Apr. 2009

40°36'47.34" N 47°56'31.40" E Höhe 0 m

Sichthöhe 8.96 km

Specific observations in the first Decade of the 2000s

- Transboundary impacts and sometimes extended large wildfires may temporarily exceed national control capabilities have prompted countries to intensify cross-boundary cooperation in fire management



International / Transboundary Issues:

International agreements and protocols

➤ **Border-crossing fires**

➤ **Border-crossing fire smoke transport affecting human health**

➤ **Long-distance transport of fire emissions**

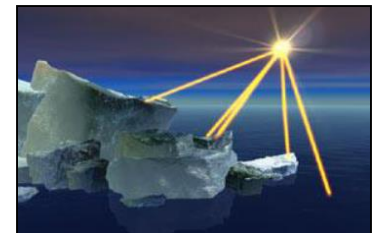
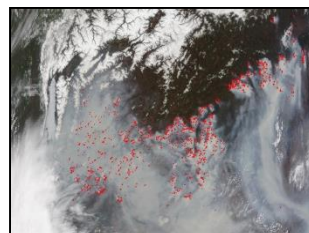
➤ **Greenhouse gases**

➤ **Bilateral agreements at national and state levels**

➤ **Bilateral agreements**

➤ **UNECE Convention for Long-Range Transboundary Air Pollution (CLRTAP)**

➤ **Paris Agreement**

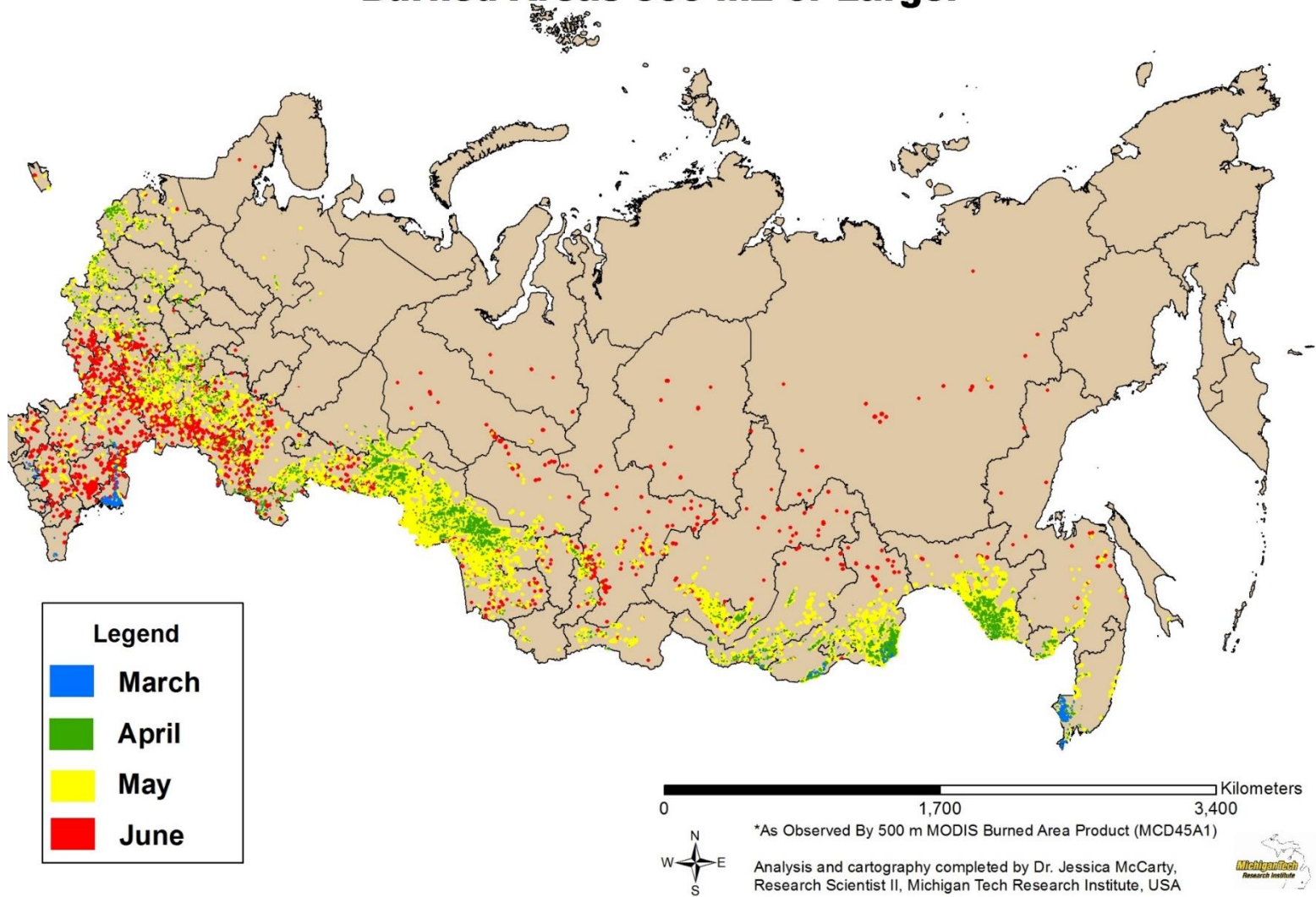


Agricultural Burning - A major source of *Black Carbon* deposits on the Arctic environment



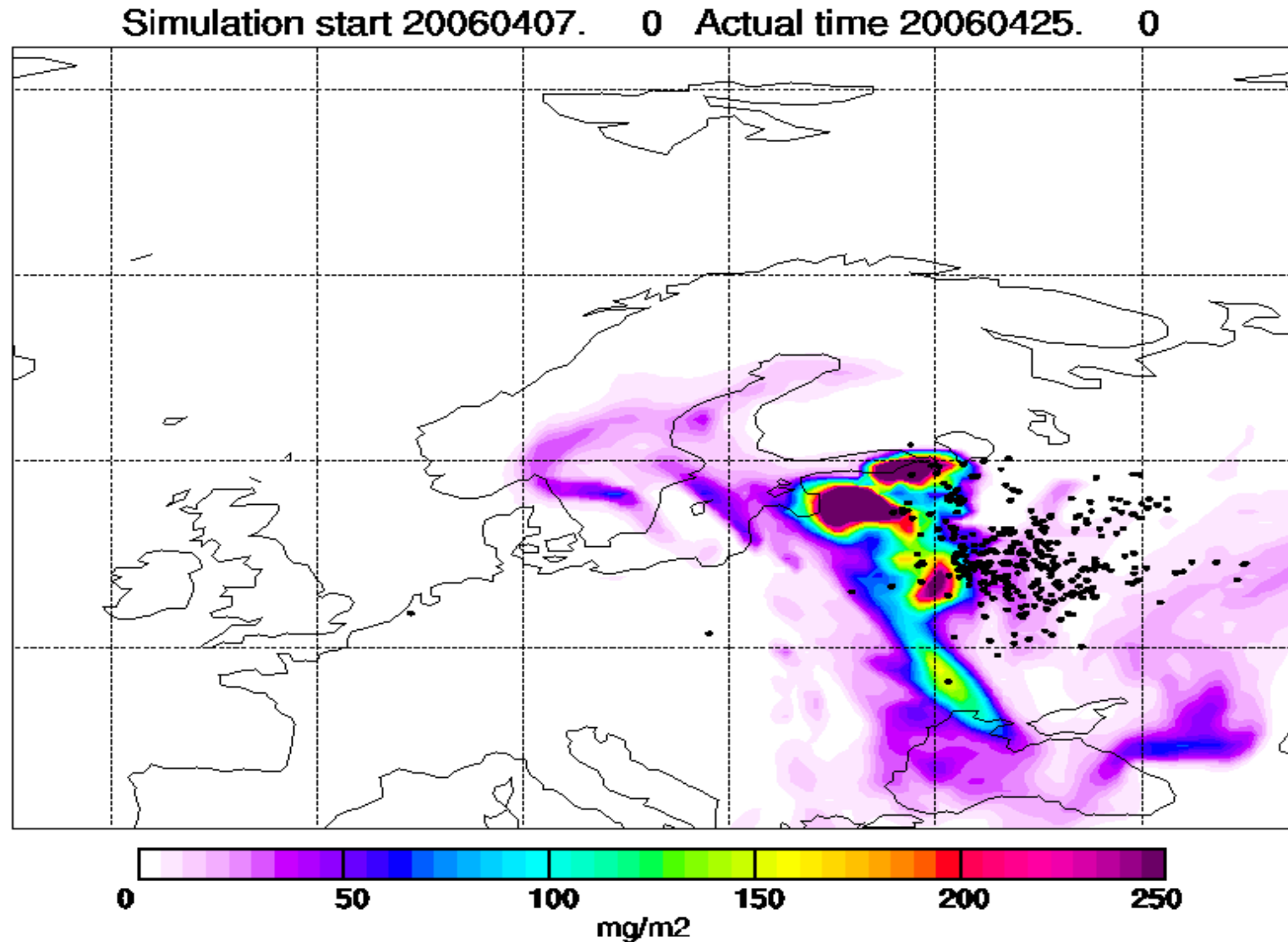
Agricultural Burning - A major source of *Black Carbon* deposits on the Arctic environment

**2006 Spring Burning in the Russian Federation
(All Land Cover Types)
Burned Areas 500 m² or Larger**

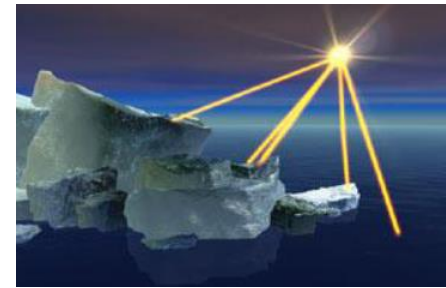


Transport of Fire Emissions to the European Arctic

Satellite images courtesy of Norwegian Meteorological Institute



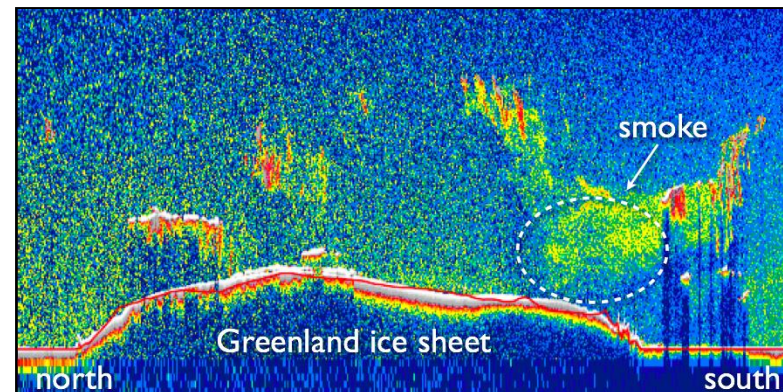
***Black Carbon* deposits on the Arctic Environment**



Aerial photo of the Greenland ice sheet surface from mid-August, 2005.



The dark areas are concentrations of light absorbing impurities. This example the impurities are some combination of dust, soot, and microbial activity.

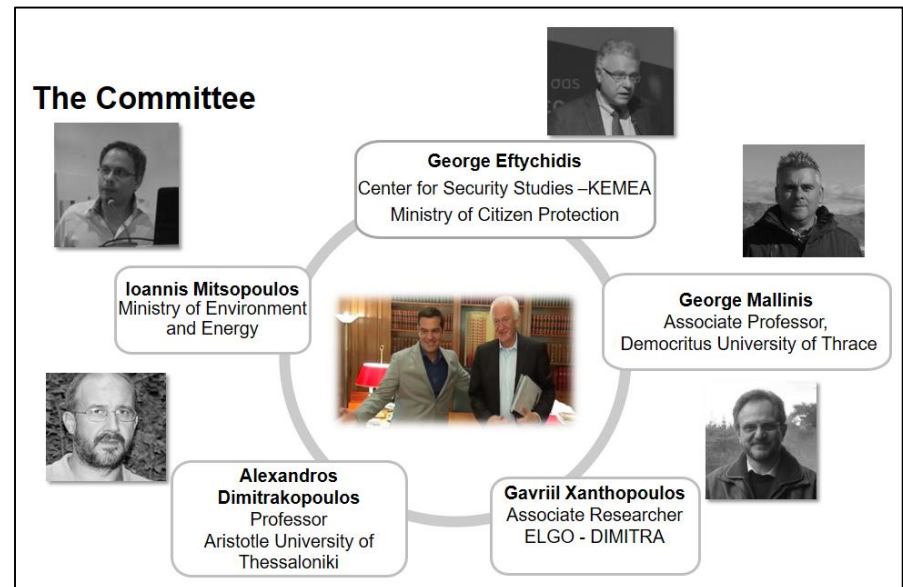


Credit: Jason Box, Ohio State University
Press release @ AGU, 07 Dec 2012

Example of developing a National Fire Management System in Europe



- Prime Minister of Greece called for assistance of GFMC
- Agreement to establish an **Independent Commission on the Future of Landscape Fire Management in Greece**, chaired by GFMC (23 August 2018)
- Work with >70 experts and 28 agencies of Greece



The Committee



Ioannis Mitsopoulos
Ministry of Environment
and Energy



**Alexandros
Dimitrakopoulos**
Professor
Aristotle University of
Thessaloniki



George Eftychidis
Center for Security Studies –KEMEA
Ministry of Citizen Protection



George Mallinis
Associate Professor,
Democritus University of Thrace



Gavriil Xanthopoulos
Associate Researcher
ELGO - DIMITRA



Follow-up of the Wildfires in Greece 2018



Επιτροπή για τις Προοπτικές Διαχείρισης
Πυρκαγιών Υπαιθρου και Δασών
στην Ελλάδα

- Inclusive procedure of defining the challenges and solutions



- Delivery of the Concept (February 2019)





Follow-up of the Wildfires in Greece 2018

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
- Assume 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.

Follow-up of the Wildfires in Greece 2018

Modus Operandi – Principles (I)

- **Transdisciplinarity 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.
- **Holistic policy, Integration and Inclusion:** Policy development and strategic planning will address the fire problem at landscape level by including all relevant institutional mandates and the potential and capacity of contribution of the civil society

Follow-up of the Wildfires in Greece 2018

Modus Operandi – Principles (II)

- **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.
- **Cohesiveness:** The National Landscape Fire Management Plan will be considered cohesive (obligatory) for individual institutional / sectoral planning and activities.
- **Coordination:** The implementation of actions under the National Landscape Fire Management Plan will be monitored on a permanent basis and highly coordinated

Fire management planning and decision making: To be based on scientific evidence (I)



Fire management planning and decision making: To be based on scientific evidence (II)



Conclusions for Future-oriented Research & Development (I)

- How will our natural and cultural landscapes respond to a the future climate of extremes?
- With regards to forests and forestry: Which tree species will cope with increasing occurrence and severities of weather / climate variability:
 - Drought
 - Storm / hurricanes
 - Extreme precipitation



Conclusions for Future-oriented Research & Development (III)

- Example of genus *Pinus* spp.: *Pinus silvestris* in Eurasia
- Highest resilience vis-à-vis weather extremes.....
..... if managed by observing natural principles




Conclusions for Future-oriented Research & Development (III)

- New integrated concepts be developed by testing traditional and cultural experienced land-use systems
 - Stable and stress-resilient multifunctional vegetation cover
 - Combined agro-sylvo-pastoral systems




Capacitation of local communities: Development of Guidelines – Examples

Defence of Villages, Farms and Other Rural Assets against Wildfires: Guidelines for Rural Populations, Local Communities and Municipality Leaders in the Balkan Region



Προστασία Χωριών, Αγροκτημάτων και Άλλων Αγροτικών Περιουσιών από Πυρκαγιές:

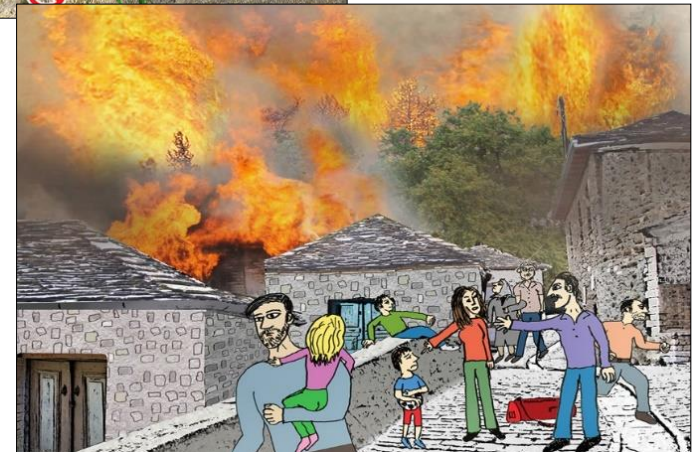
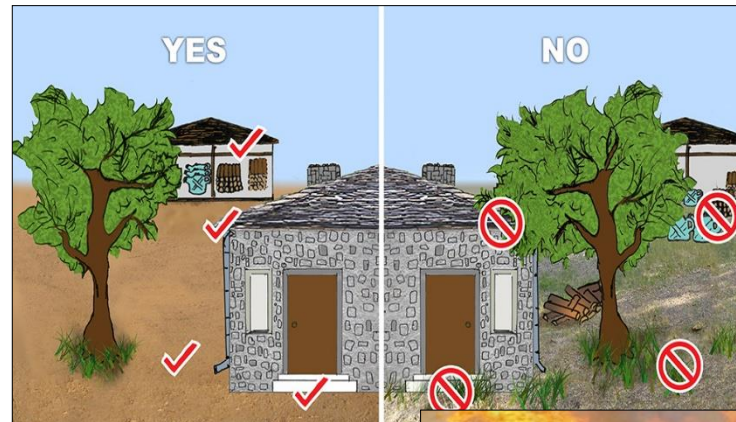

Οδηγίες προς τον Τοπικό Πληθυσμό και τις Δημοτικές Αρχές στην Περιοχή των Βαλκανίων



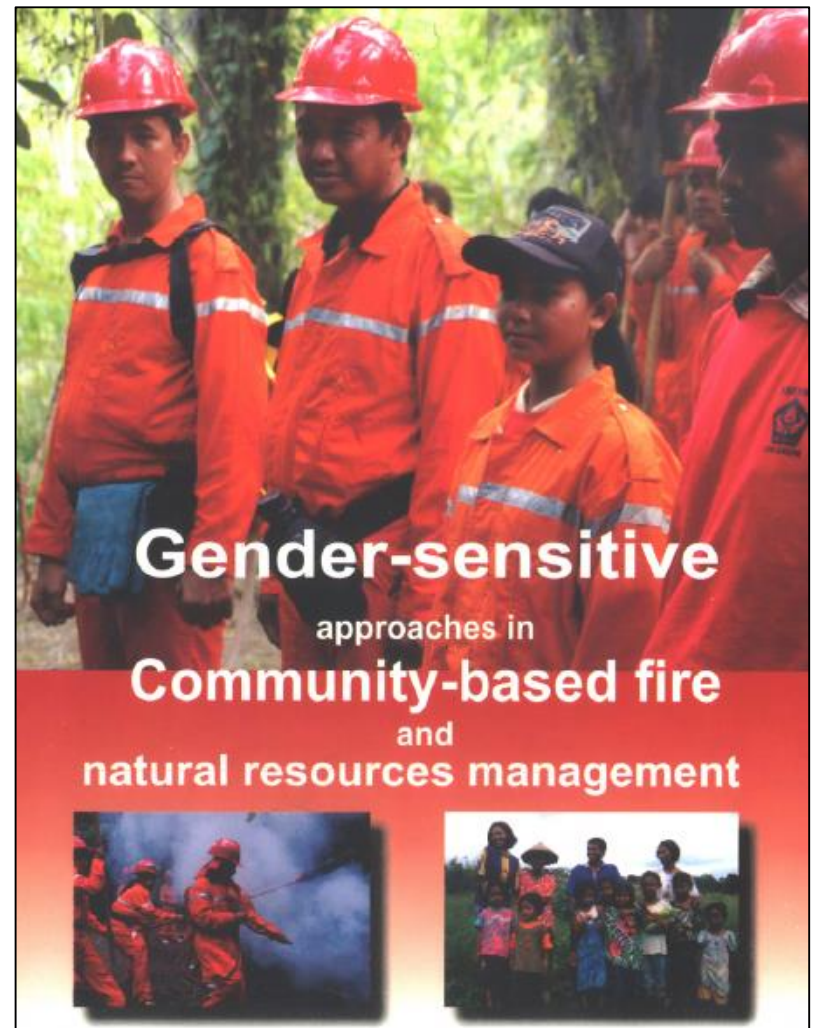
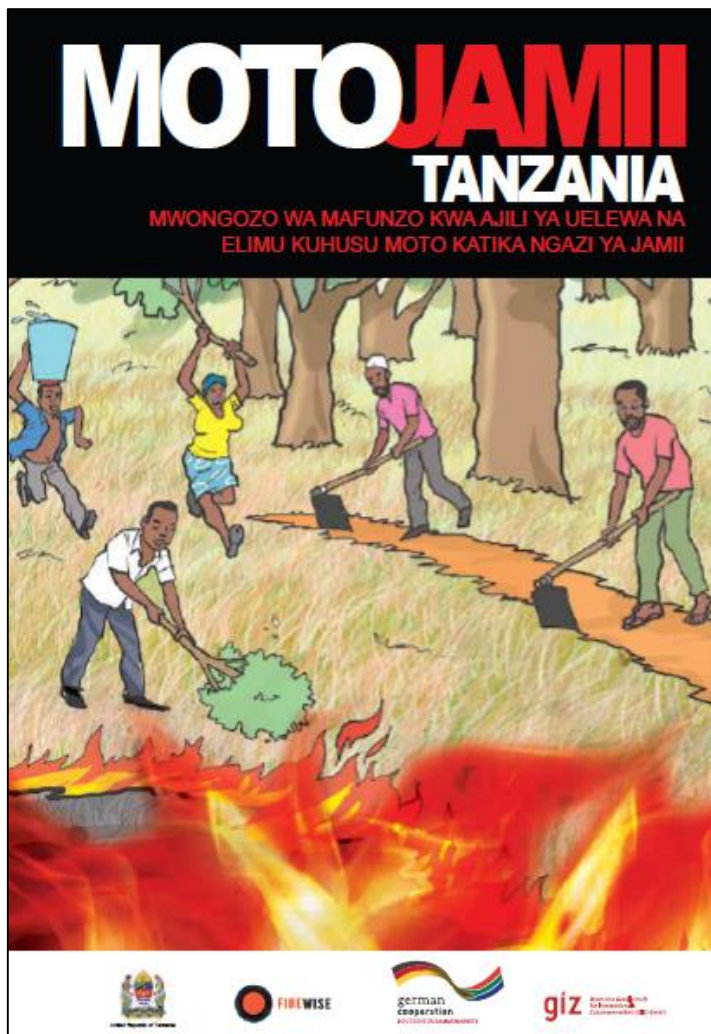
Δημοσίευση του Παγκοσμίου Κέντρου Παρακολούθησης Δασικών Πυρκαγιών σε συνεργασία με την Άνοχη Μερική Συμφωνία για την Αντιμετώπιση Μεγάλων Καταστροφών του Συμβουλίου της Ευρώπης

Με την ευγενική υποστήριξη του

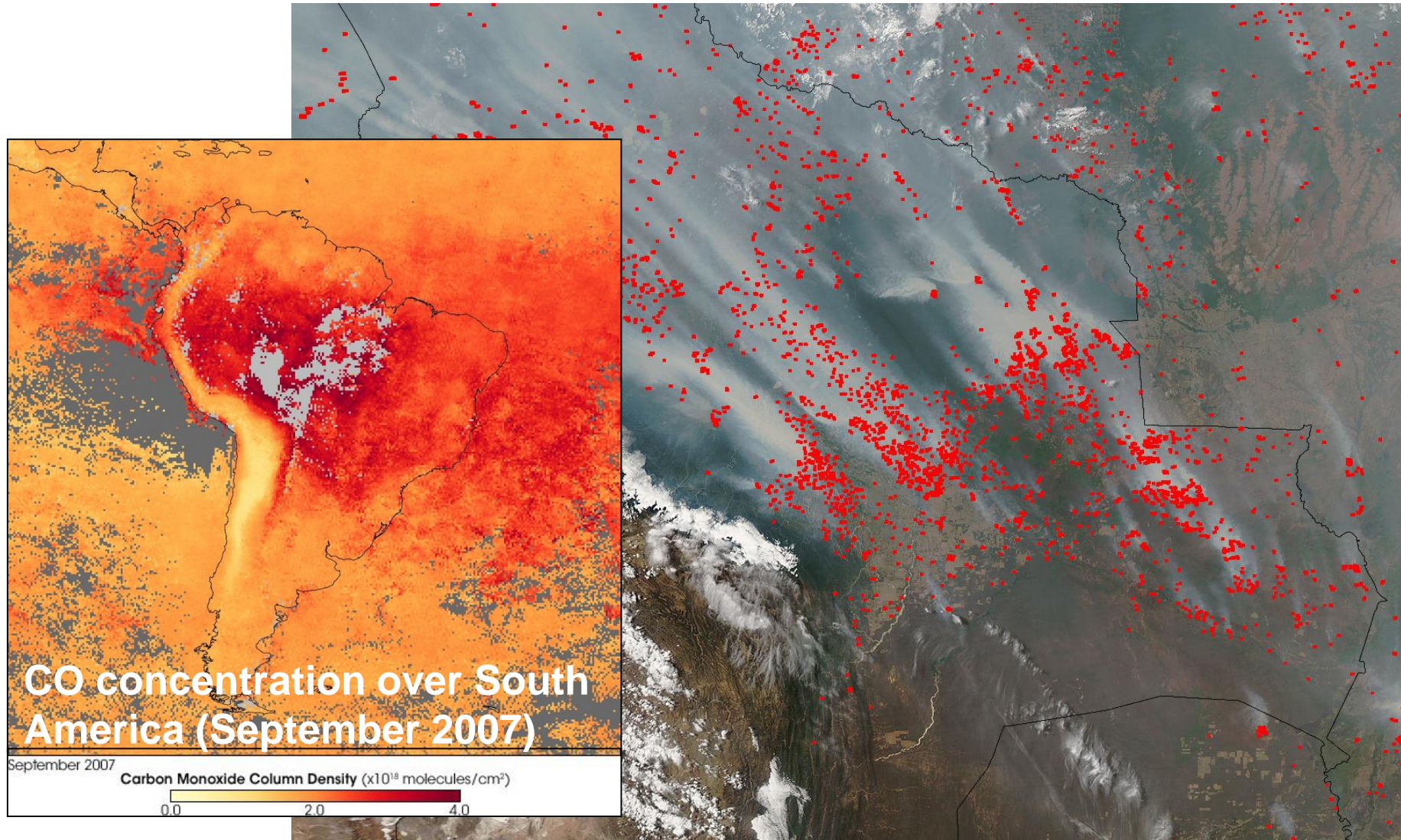
Ιδρύματος Μαρία Τσάκος - Διεθνές Κέντρο Ναυτικής Έρευνας και Παράδοσης



Capacitation of local communities: Development of Guidelines – Examples

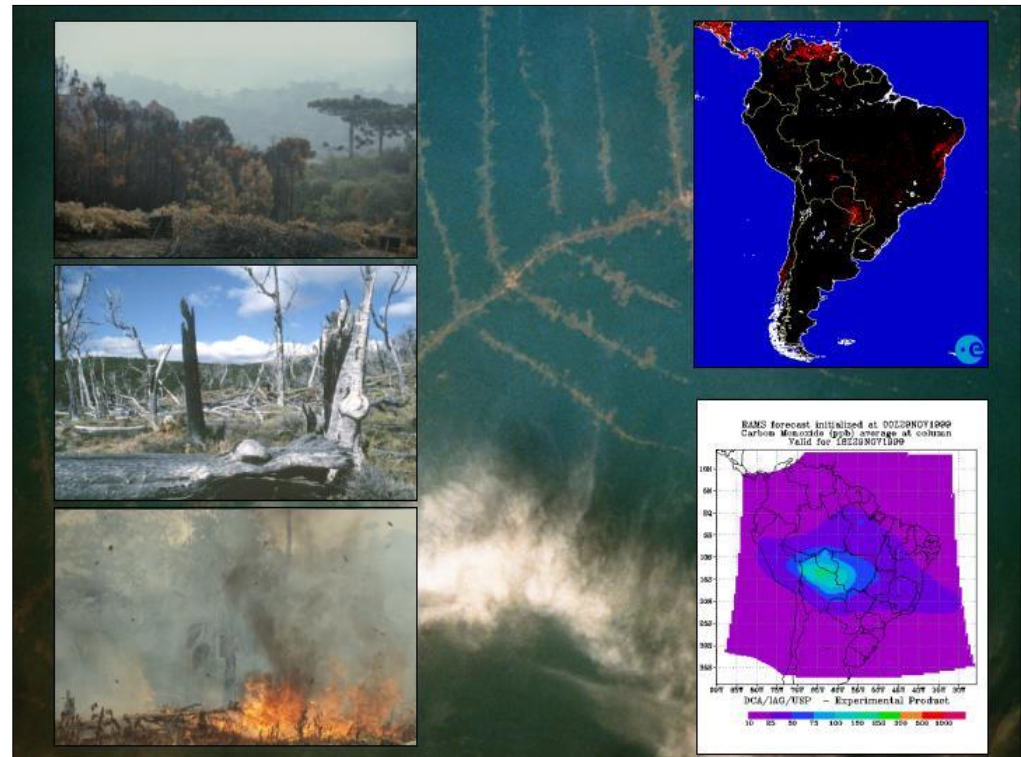


South America – A Continent on Fire



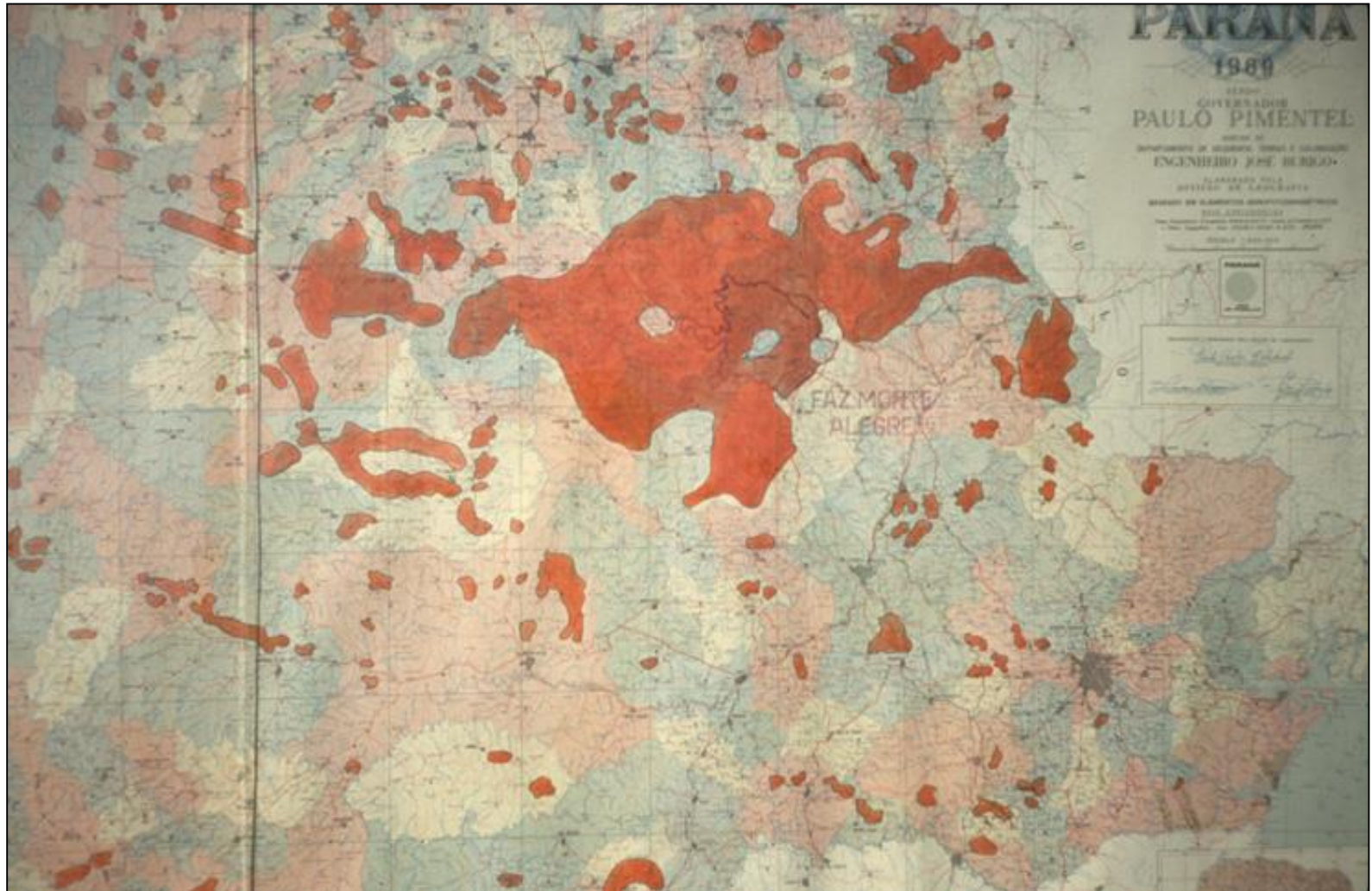
South America: A facet-rich fire region

- Equatorial rain forest
- Cerrado / Cerradao
- *Araucaria* and *Nothofagus* forests
- Degraded grasslands and savannas

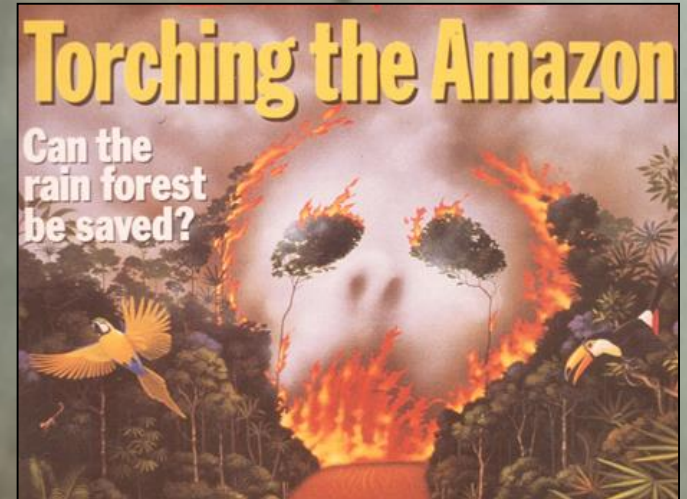


Brazil 1969

The first large-scale wildfires burning industrial plantations

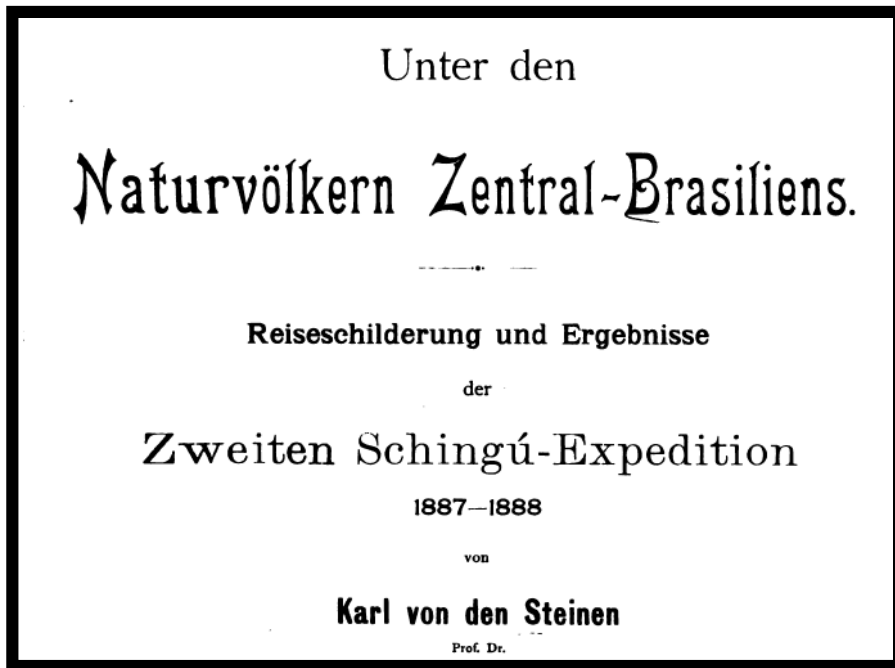


The 1980s rapidly expanding uncontrolled slash-and-burn agriculture, industrial conversion burnings.....

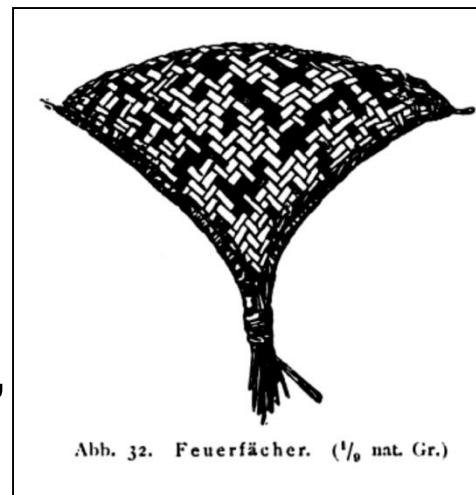


Analyzing the past: Xingú Anthropological Fire History

Second Xingú Expedition – Karl von Steinen – 1887-1888



The Xingú “fire fan”



Landscape fire ecology of Central Brasil

First Modern Cerrado Jalapão Fire Expedition – 2013



Landscape fire ecology of Central Brasil

First Modern Cerrado Jalapão Fire Expedition – 2013





Seminário Regional sobre Manejo Integrado do Fogo
Resultado do Projeto Cerrado - Jalapão



Example Brazil:

**Progress in developing a
National Policy and Legislation
on Integrated Fire Management**



Context

- Policy of fire exclusion
- Loss of traditional knowledge
- Change in habits and traditional practices
- Biomass accumulation
- Large scale and high intensity fires
- Inefficient and high cost fire combats

Last years (after Law Nº 12.651/2012 – the New Forest Code)

- Fire as a management instrument
- Exchange of experiences with other countries: South Africa, Australia (2013)
- First experiences: Cerrado Jalapão Project (2014-2017) – German Cooperation
- Paradigm shift: fire as a management instrument = Integrated Fire Management



Myers (2006)

Approach that associates ecological, socioeconomic, cultural and technical aspects with the goal of integrating actions for the proper use of prescribed and controlled burnings and fighting landscape fires



Integrated Fire Management: Results

- Reduction of dry biomass
- Reduction of burned area by fire event
- Facilitated combat with less resources: less time spent for fighting the same fire
- Working together: managers and local communities
- Valuation of traditional practices and empowerment of local communities
- Reduction of large scale uncontrolled forest fires
- Changing fire regime (seasonality): late → early



Integrated Fire Management: Does it work?



15 days after uncontrolled wildfire



15 days after prescribed burning

The National Policy of Integrated Fire Management

Goal

Promoting inter-institutional articulation for implementing the Integrated Fire Management, aiming the reduction of the incidence and damage of forest fires throughout the country, and the restoration of ecological and cultural role of fire.



Development of the NPIFM Bill



2016/2017

Nov 2016 – Mar 2017

Meetings MMA and other responsible institutions (6)

Apr-Mai 2017

- 15 Ministries
- 23 institutions
- 7 themes

July 2017

- Academy and civil society
- States
- Indigenous populations and traditional communities

Aug-Nov 2017

- Consolidation of contributions
- Legal analysis/ MMA

Nov-Dec 2017

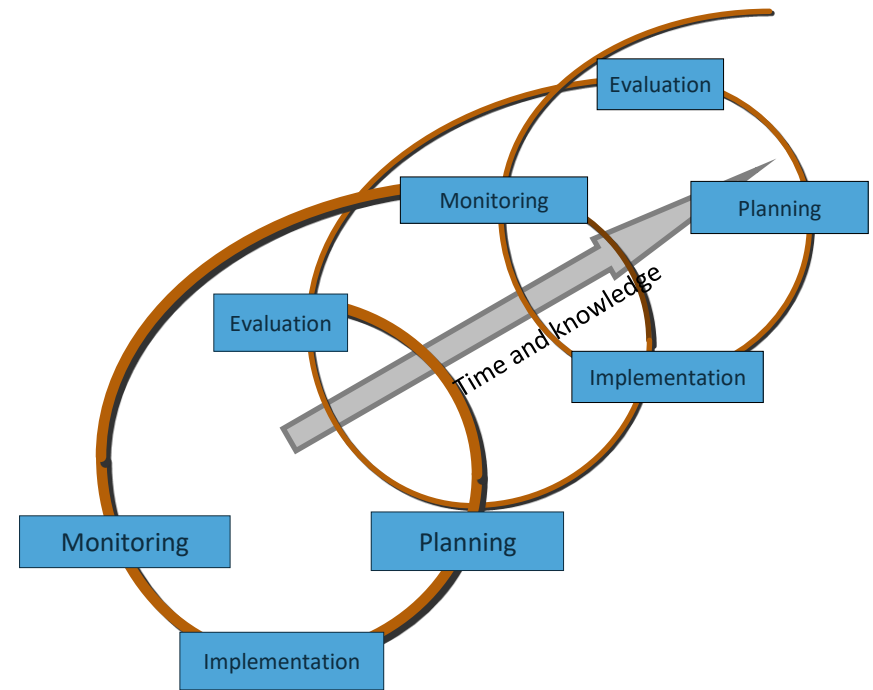
- Following the processing by the WG

Integrated Fire Management

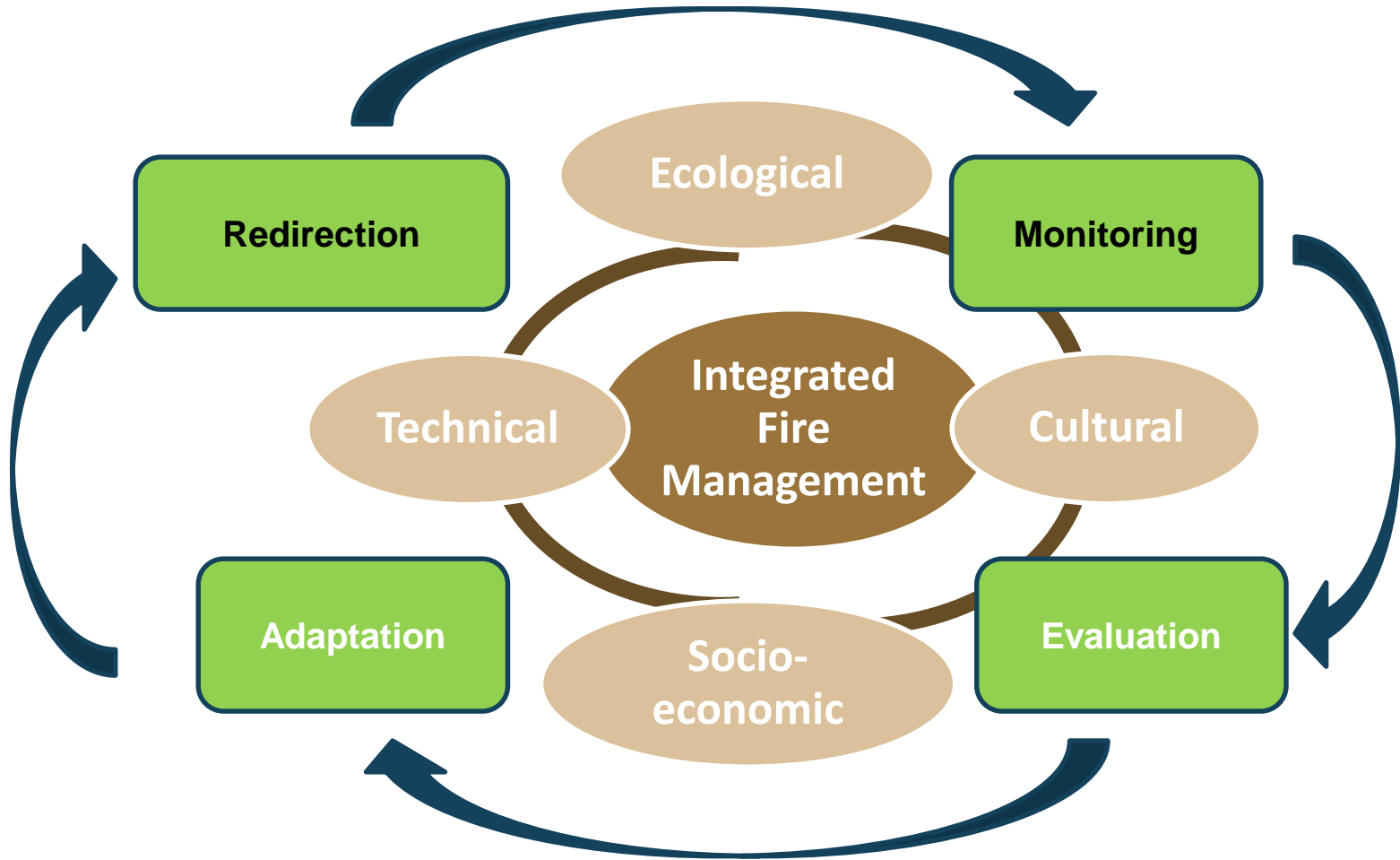
Model that associates ecological, socioeconomic, cultural and technical aspects with the goal of integrating actions for the proper use of prescribed and controlled burnings and fighting landscape fires

Approach that involves constant **monitoring, evaluation, adaptation and redirection**, aiming at:

- Biodiversity conservation
- Reduction of fire severity
- Respect of traditional use of fire



Integrated Fire Management



National Policy on Integrated Fire Management

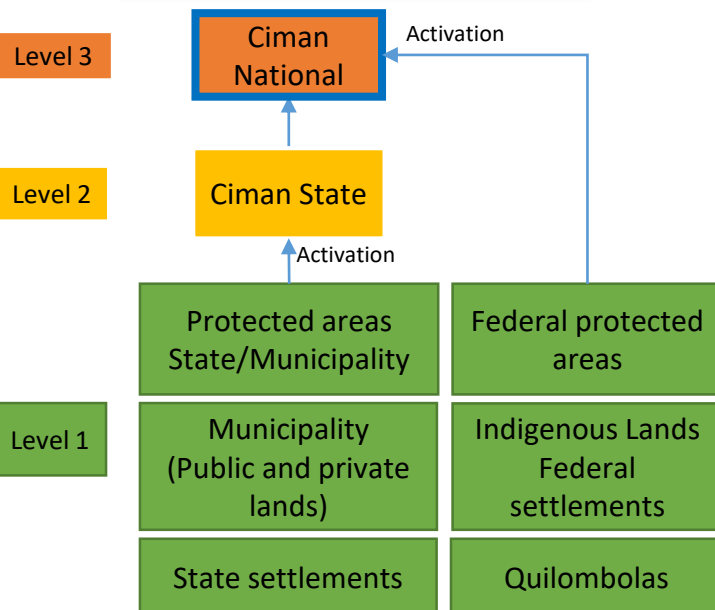
STRATEGIC COORDINATION

**National Committee on Integrated Fire Management - COMIF
(Working Groups)**

Interinstitutional state level instances of Integrated Fire Management

Standardization

WILDFIRE SUPPRESSION



PREVENTION

Fire Use

Monitoring

Replacing the use of fire

Environmental education

Research

ACCOUNTABILITY

Causality nexus
(technical report)

Sisfogo

Forest Firefighters Programs

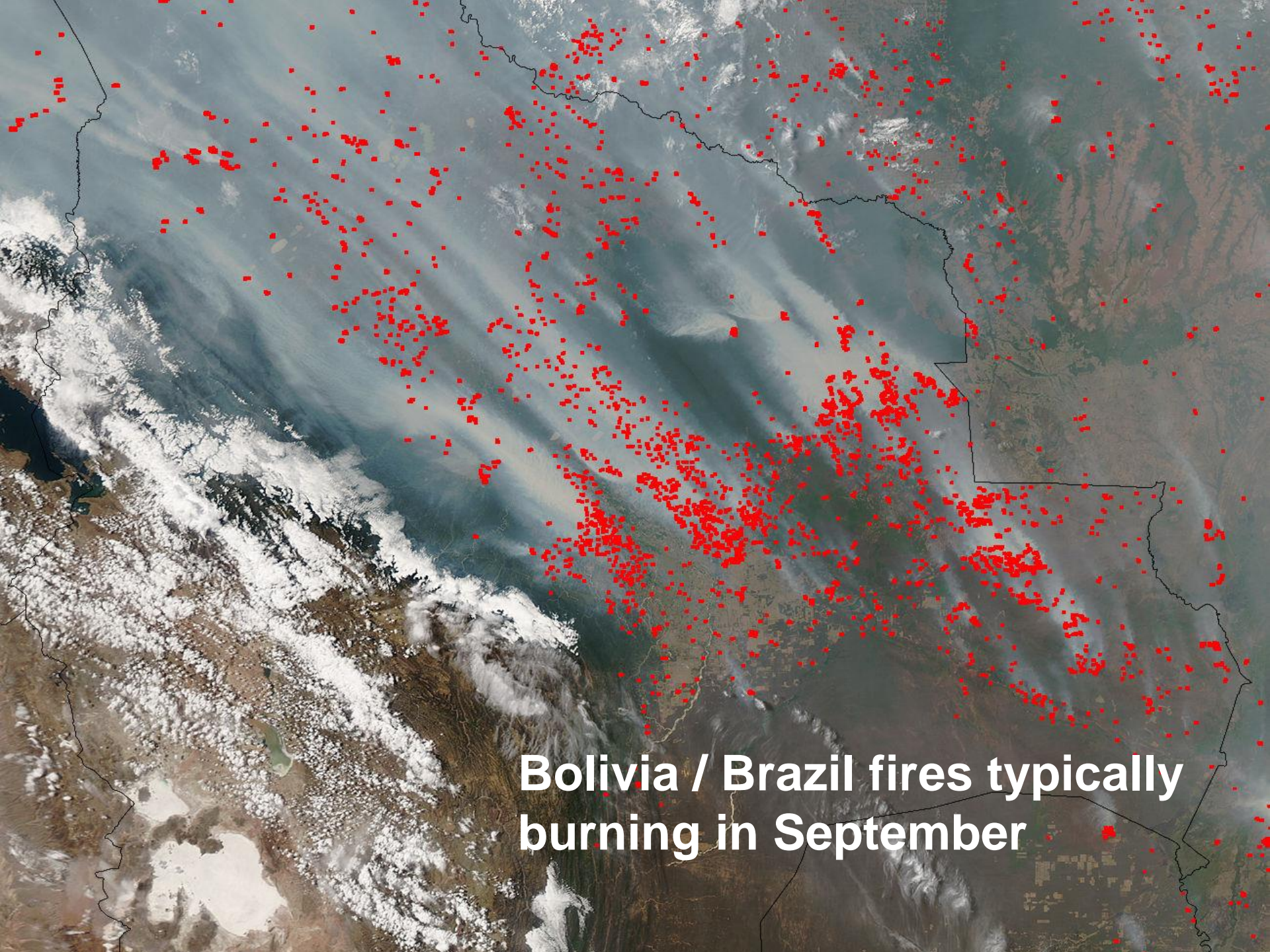
(IBAMA, ICMBio, States, Municipalities and private sector)

Financing Instruments

Next steps:

- Approving the Bill in the Congress (NPIFM)
- Extension of the pilot program to new areas
- Escalate the program to a landscape approach

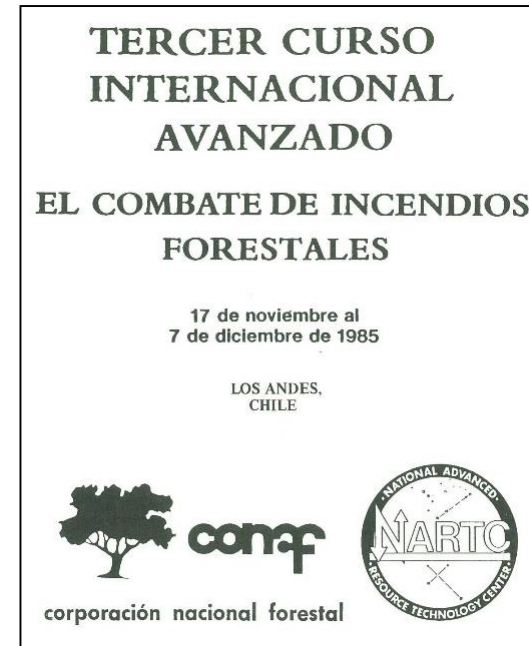




**Bolivia / Brazil fires typically
burning in September**

History of Regional Cooperation in Fire Management: Joint Regional Training (I)

- **1985-2016** Continuing training courses hosted by Chile
- **1986** Buenos Aires, Argentina, curso de manejo del fuego



History of Regional Cooperation in Fire Management: Joint Regional Training (II)

- **1990** Bariloche, Argentina, curso provincial de combate de incendios forestales
- **1990 and 1991** Maldonado, Uruguay, cursos de control de incendios forestales
- **1991+** Brazil, Colombia, Bolivia, Honduras



History of Regional Cooperation in Fire Management: Joint Emergency Response (I)

- **2014** Continuing Brazil – Chile in Biobío & Araucania regions (February 2014)



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

- **Foundation** of the Regional South America Wildland Fire Network 15 years ago: June 2004 (Curitiba)
- **Chairs:** Chile and Brazil
- **Regional exchange** between scientists, practitioners and policy makers



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

- Inter-regional cooperation with the Central American and Caribbean Networks



History of Regional Cooperation in Fire Management: The Regional Network (III)



- Regional and inter-regional (with African countries) research and fire management exchanges (Brazil)



Activities (I)



▪ Brazil and South America (2016-2017)

- Regional Seminar between scientists practitioners and policy makers (Gurupí, Tocantins, November 2016):
- Opening of the Environmental Monitoring and Fire Management Center (Gurupí, Tocantins, November 2016)
- This Center will become part of the future **Regional Fire Management Resource Center for South America** (to be confirmed in 2017)



Activities (III)

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

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

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



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

- Introduction of the EuroFire Competency Standards in Spanish and Portuguese (Brazilian)
- Introduction of the International Fire Aviation Guidelines



International competency standards for training of firefighters



June 2019:

**Available in 22
languages for the
use in 60+ countries**

www.euro-fire.eu



Estándares de Competencias y Materiales de Entrenamiento

Versión en Español para América Latina y el Caribe

Incluido Estándares en Portugués

Introducidos para la ocasión del

**Primer Simposio Regional de Cooperación en
Manejo del Fuego Inter-Fronterizo en Sudamérica**

Parque Nacional Santa Teresa, Uruguay, 30 de Mayo al 02 de Junio 2016



Con el patrocinio de:
Ministerio Federal de Alimentación y Agricultura
en virtud de un acuerdo del Bundestag Alemán

Examples of Practicing Preparedness and Cross-boundary Interoperability in Fire Management

EuroFire

- First and Second International Fire Management Training Course for the South Caucasus and Western Balkans – Attended by 10 Countries (Turkey, 2010 and 2014)
- First International Fire Management Week, Islamic Republic of Iran (May 2016)



Chile Landscape Fire Emergency

- January / February 2017 -



Chile Landscape Fire Emergency

- January / February 2017 -

- International efforts and engagement to bring the wildfires under control



Concerns and Needs

- Current prevailing focus on fire suppression, notably on aerial resources
- Need for addressing the underlying causes of landscape fires: Migration, urbanization, land-use change
- Need for prioritizing action concerning expected impacts of climate change
- Participatory approaches to be strengthened: Support of land management by subsidies (CO₂ tax....)

Chile Landscape Fire Emergency

- January / February 2017 -

- The way ahead
 - Chile-Germany cooperation to assess the damages caused by the fires



Chile Landscape Fire Emergency

- January / February 2017 -

- **The way ahead**
 - **CONAF / GFMC cooperation to assess the damages caused by the fires**



Chile Landscape Fire Emergency

- January / February 2017 -

- **The way ahead**
 - **CONAF / GFMC cooperation to follow-up to foster cooperation in cross-boundary fire management between South American countries in 2017**

With support from



Federal Ministry
of Food
and Agriculture

by decision of the
German Bundestag



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

- 9 (10) South American Countries attending with representation at high level





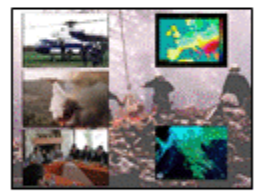
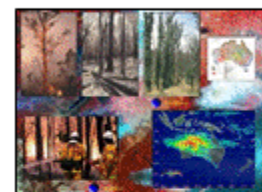
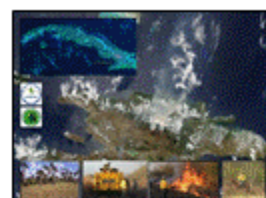
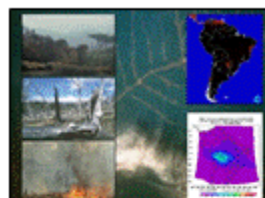
3-4 October 2017: Regional Consultation on Transboundary Cooperation in Fire Management accomplished

- Viña del Mar Declaration
- Official document that shall be endorsed and followed up by all South American countries
- Signing of an agreement between CONAF and GFMC
- Initiation of the formal dialogue between government agencies in 10 South American countries
- Establishment of the Fire Management Resource Center – South America Region (FMRC-SAR)

The Global Wildland Fire Network in 2019

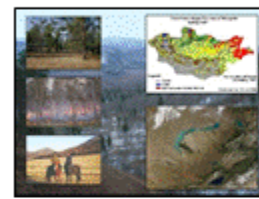
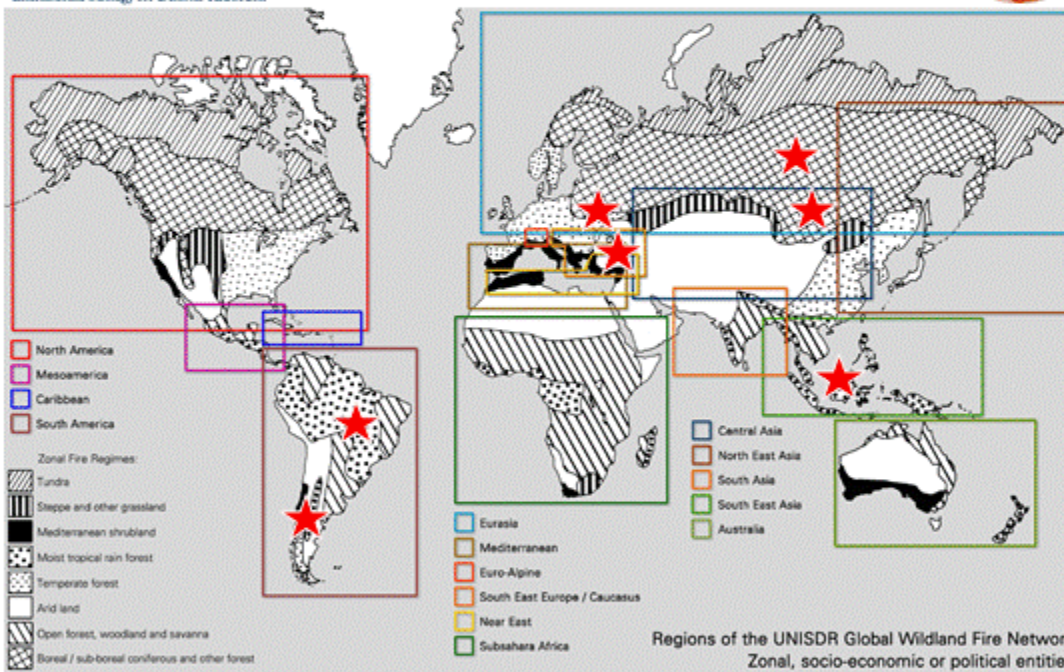
14 Regional Wildland Fire Networks

and 6 Regional Fire Management Resource Centers ★ (South America in Foundation)

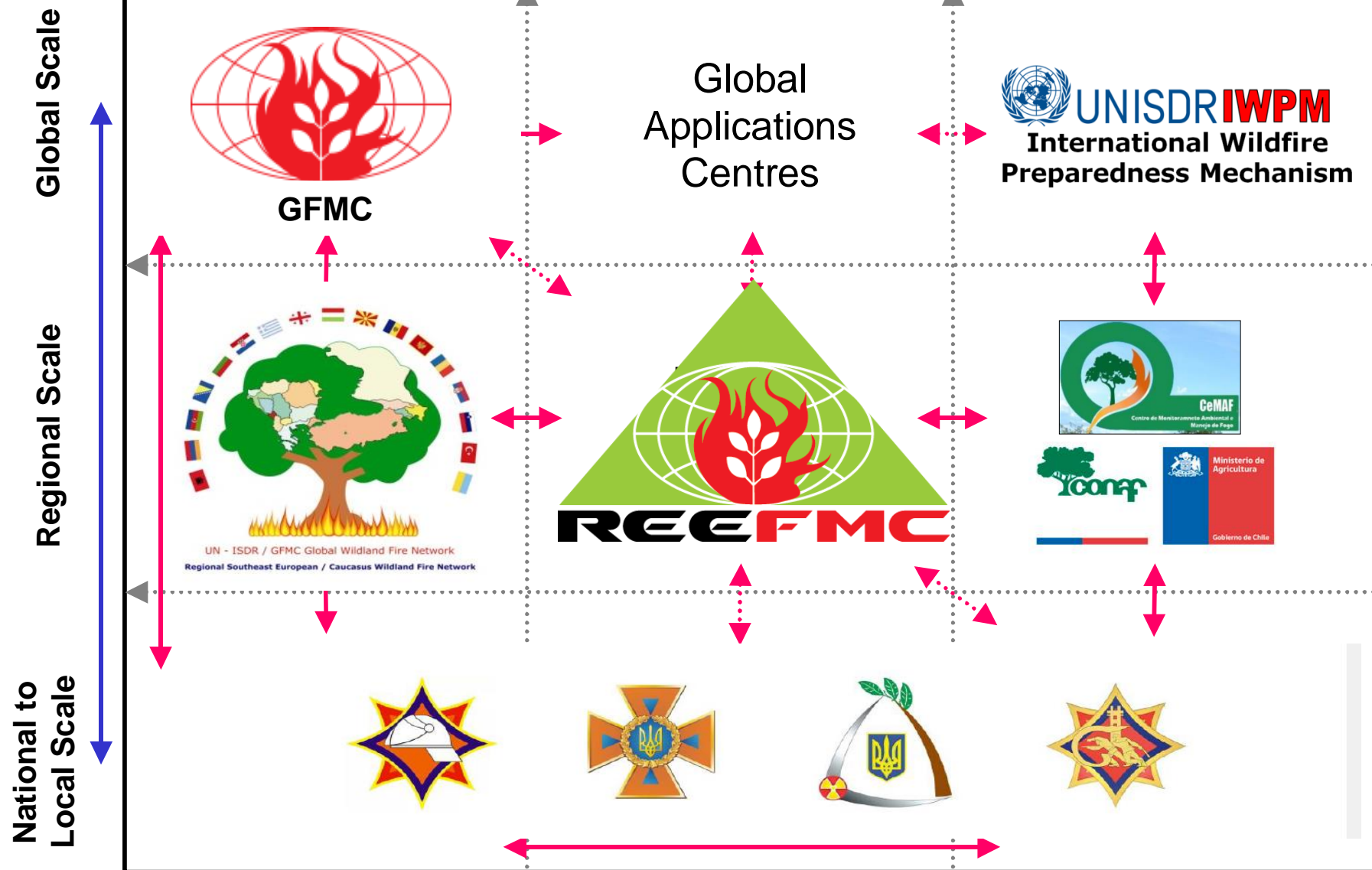


International Strategy for Disaster Reduction

The UNISDR Global Wildland Fire Network



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



One of the Deliverables of the Example the Fire Management Resource Center – South America Region (FMRC-SAR) Gurupí:



Recent Global Activities – Examples (I)

- Presentation of the agenda of the Global Wildland Fire Network and the International Wildfire preparedness Mechanism (IWPM) at the UNDRR Global Platform for Disaster Risk Reduction 2019: The IGNITE STAGE



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#GP2019Geneva

#TheResilienceDividend

#SendaiFramework

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> PROGRAMME



SPEECHES AND STATEMENTS

Building and strengthening green DRR infrastructure at landscape level: holistic and inclusive approaches in landscape fire management

15 MAY 2019

12:00 - 12:15



Recent Global Activities – Examples (II)

- Statement to the UN and GPDRR Audience: “Meeting Global Landscape Fire Challenges: Towards Informed Wildfire Disaster Reduction Policies”



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Speeches and Statements

Opening and closing ceremony speeches



Stakeholder Declaration directed to the 2019 Global Platform for Disaster Risk Reduction

The Means Necessary

A stakeholder declaration to the 2019 Global Platform for Disaster Risk Reduction

When people work together, they thrive together. Our lives are entirely interdependent and disasters, perhaps more than any other events, demonstrate this reality in stark relief.

Many hazards are increasing in severity and frequency, a trend that is likely to accelerate with global climate change and the large-scale degradation of ecosystems, leading to new humanitarian crises. Disasters cause far-reaching economic and structural disruption, and have long-term social and psychological impacts. Years after being struck by earthquakes, ghost towns remain where bustling communities once thrived in Italy, and Nepal is heavily indebted and struggling to rebuild. Vanuatu has not recovered from the economic shock of a cyclone that pushed large segments of the population back below the poverty line. Devastating wildfires in Australia, Chile, Greece, Russia and the US, and slow-onset disasters from Africa's Sahel region to the Pacific Islands, demonstrate the universal challenges that local people, national authorities and the international community face.

Finally – Message of the Global Wildland Fire Network to this Seminar





**SEMINARIO INTERNACIONAL
PLANIFICACIÓN Y PREVENCIÓN DE
INCENDIOS DE PAISAJE Y EL ROL DE LA
RESTAURACIÓN POST INCENDIOS**

Santiago, Chile, 20 y 21 de junio 2019

Gracias | Thank You