



CENTRO UNIVERSITARIO EUROPEO
PER I BENI CULTURALI

**International Conference on
CULTURE AGAINST DISASTERS
PROTECTING CULTURAL LANDSCAPES
AS PREVENTION OF NATURAL DISASTERS**



Wildfire Risks and Fire Use in Changing Cultural Landscapes

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Global Fire Monitoring Center (GFMC)
A Specialized Euro-Mediterranean Center of EUR-OPA

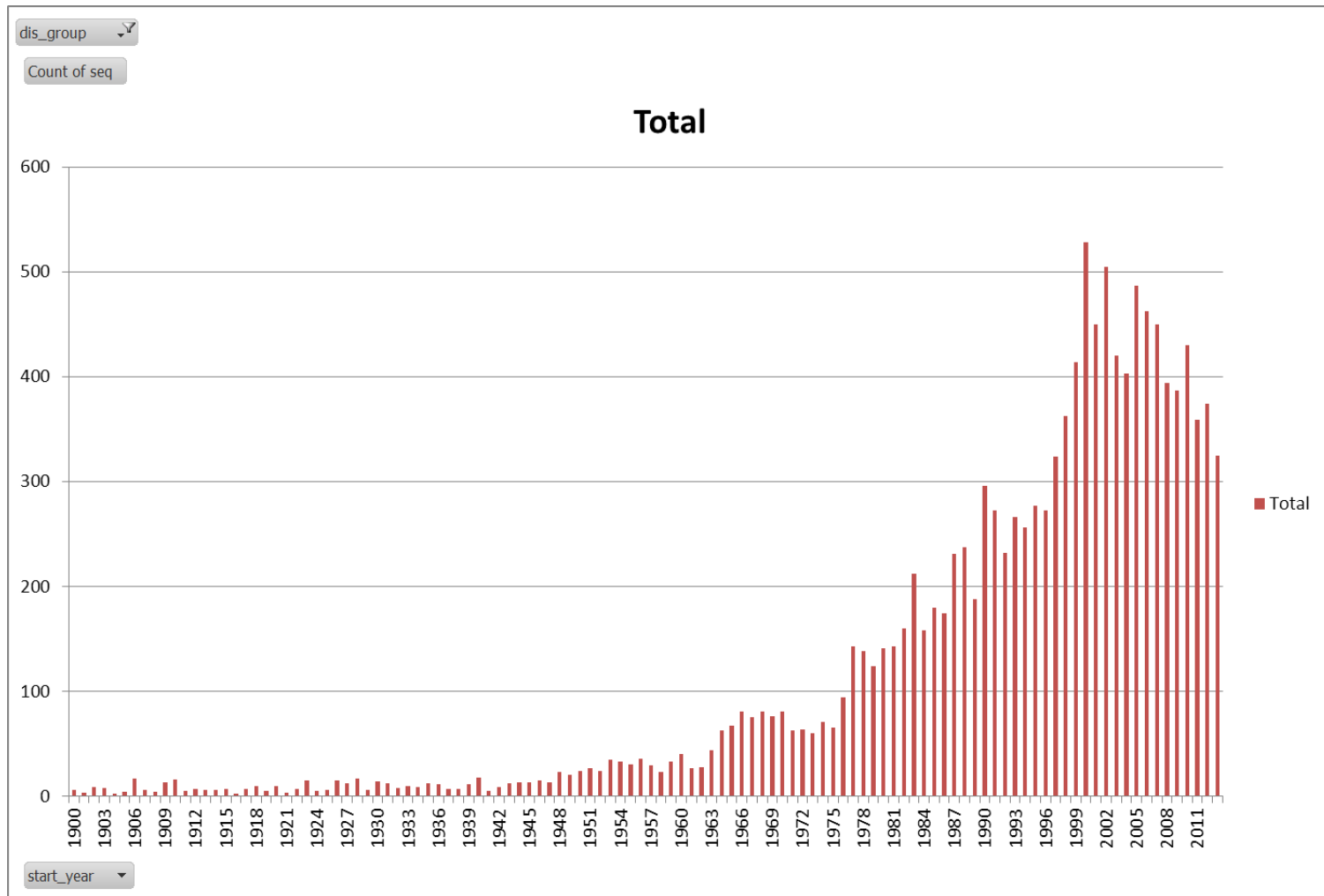


**The Global Fire
Monitoring Center
(GFMC)**

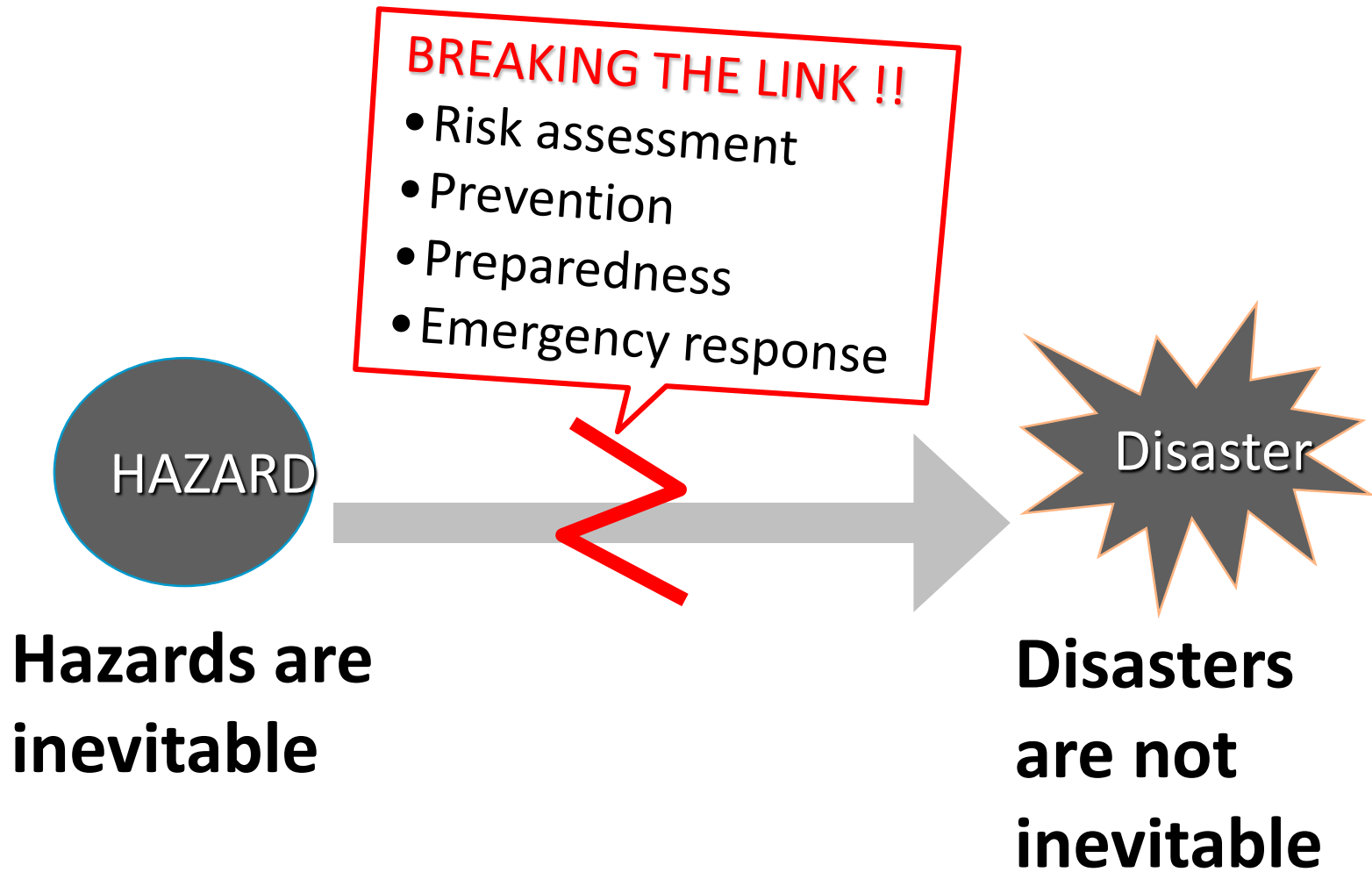


**Heritage is at risk
from disasters and conflicts**

Natural Disasters reported 1900-2013



Hazard - Disaster



Disaster Risk Reduction for Cultural Heritage



**GLOBAL FIELD OF
RISK REDUCTION**



CULTURAL HERITAGE

Decision-makers do not recognize heritage as a priority; The global Disaster Risk Reduction sector is currently not concerned with the heritage.

The Cultural Heritage sector is not familiar with disaster reduction

Disaster Risk Reduction for Cultural Heritage

IMPLICATIONS

- Decision-makers and professionals should invest in heritage conservation as a means to reduce risks from disasters
- Normal Disaster Reduction approaches and methods may not be adequate or sufficient for heritage
- Integrating heritage into wider DR strategies requires a special perspective, the direct involvement of local communities and specific expertise

Effects of Wildfires on Cultural Heritage Sites

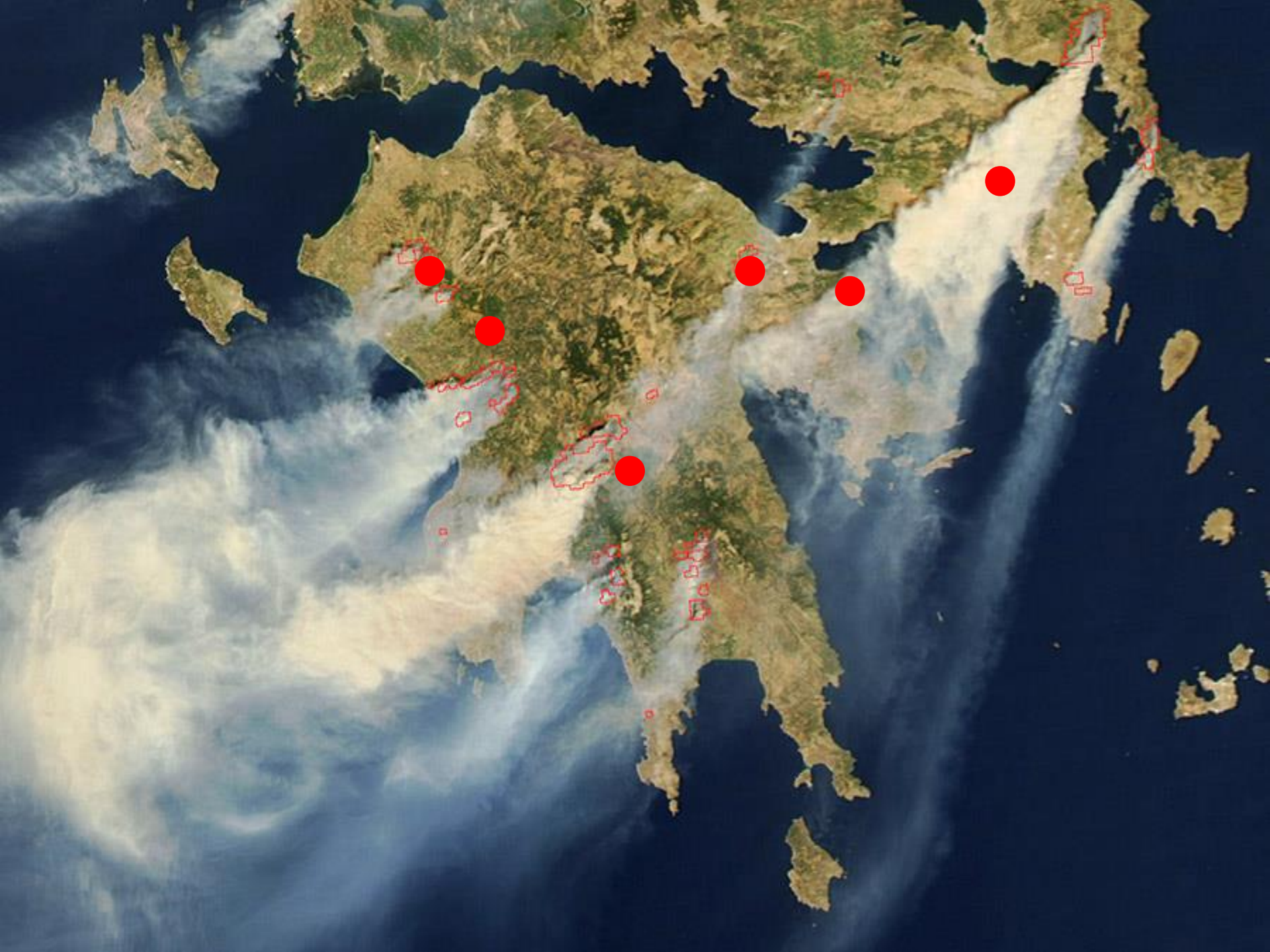
- **Wildfires** are critical & important events because **the evolution of the natural environment** goes along with the local history
- The influence of fire on ecosystems **is not static and instant** it has dynamic perspectives in space & time.
- Changes in the natural environment **are not restricted in the timeframe following an event,** but they occur in the long run



Effects of Wildfires on Cultural Heritage Sites

- Many of cultural heritage and archaeological sites, are covered with vegetation or situated close to forest regions exposed to increased risk of forest fire.
- The increase in seasonal temperatures has caused an explosion in the number of wildfires in many forested areas. Fanned by the dry winds, and fuelled by dry vegetation, some of these fires have become disastrous for many cultural heritage sites.





Trends all over Europe: Increasing Wildfire Hazard

Underlying Causes

- Urbanization (= rural exodus)
- Increasing wildfire hazard because of abandonment of land cultivation
- Weakened professional and local community work force to cultivate lands, to use fire properly, and to control wildfires
- Climate change: Increasing occurrence and severity of droughts



Examples of Underlying Causes of Increasing Severity and Destructivity of Fires in Western Eurasia

- Decrease of utilization of biomass
- “Unused energy” is now available to be burned by wildfires, fuelling fire severity all over Europe



Example – Balkans

Rural exodus and abandonment of land use after more than 2000 years of intensive cultivation:



Example – Balkans

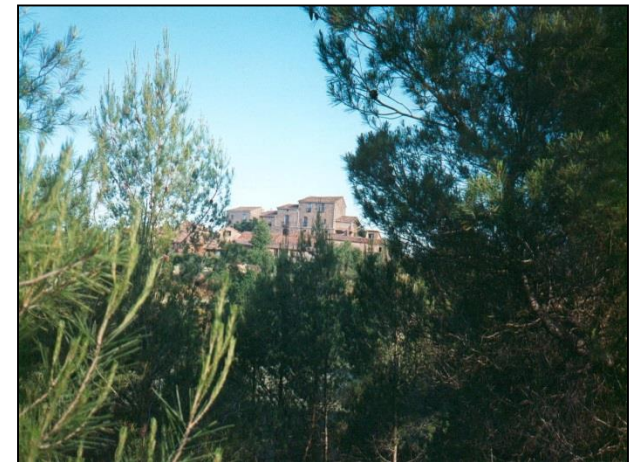
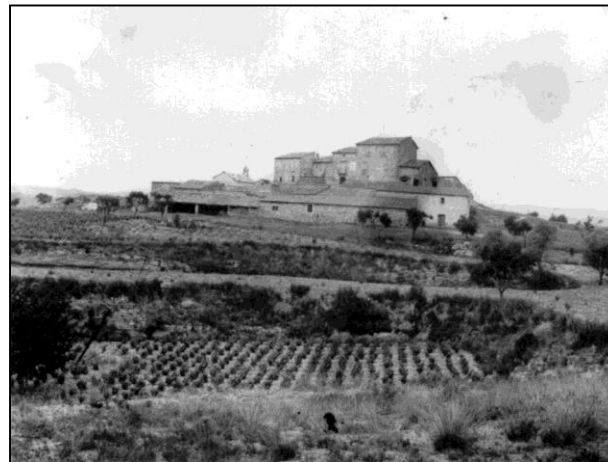
Abandoned cultural landscapes

Former pasture lands now overgrown by forest



Change of fire regimes in cultural landscapes

- Traditional villages are abandoned
- Large areas of agriculture are abandoned and become more vulnerable to wildfire
- In many regions weekend / summer houses increasingly replace traditional village structures



Spain: Masia Can Tardà. Castellolí (Anoia) – 1950 and 2001



Example Russia

1991-2009

27 million ha of agricultural land abandoned and subjected to fallow



2010

- 3000 villages abandoned
- Extended wildfires in Western Russia



In many countries of Eurasia: Legal / technical vacuum for managing agricultural fires

Settlements

Agricultural
Lands

Forest

Vacuum

Fire Services



Forest Services



Increasing Wildfire Hazard in Mediterranean Europe in Europe

- Tourism sector does not replace land cultivation
- Fires entering cities, towns and villages



Urban Wildfires in the Mediterranean



Garajonay National Park - Spain



Mount Athos - Greece



Historic quarters – Valparaiso - Chile



Naksansa Temple in Yang-Yang – S.Korea



Fire Risk Management in Cultural Heritage sites

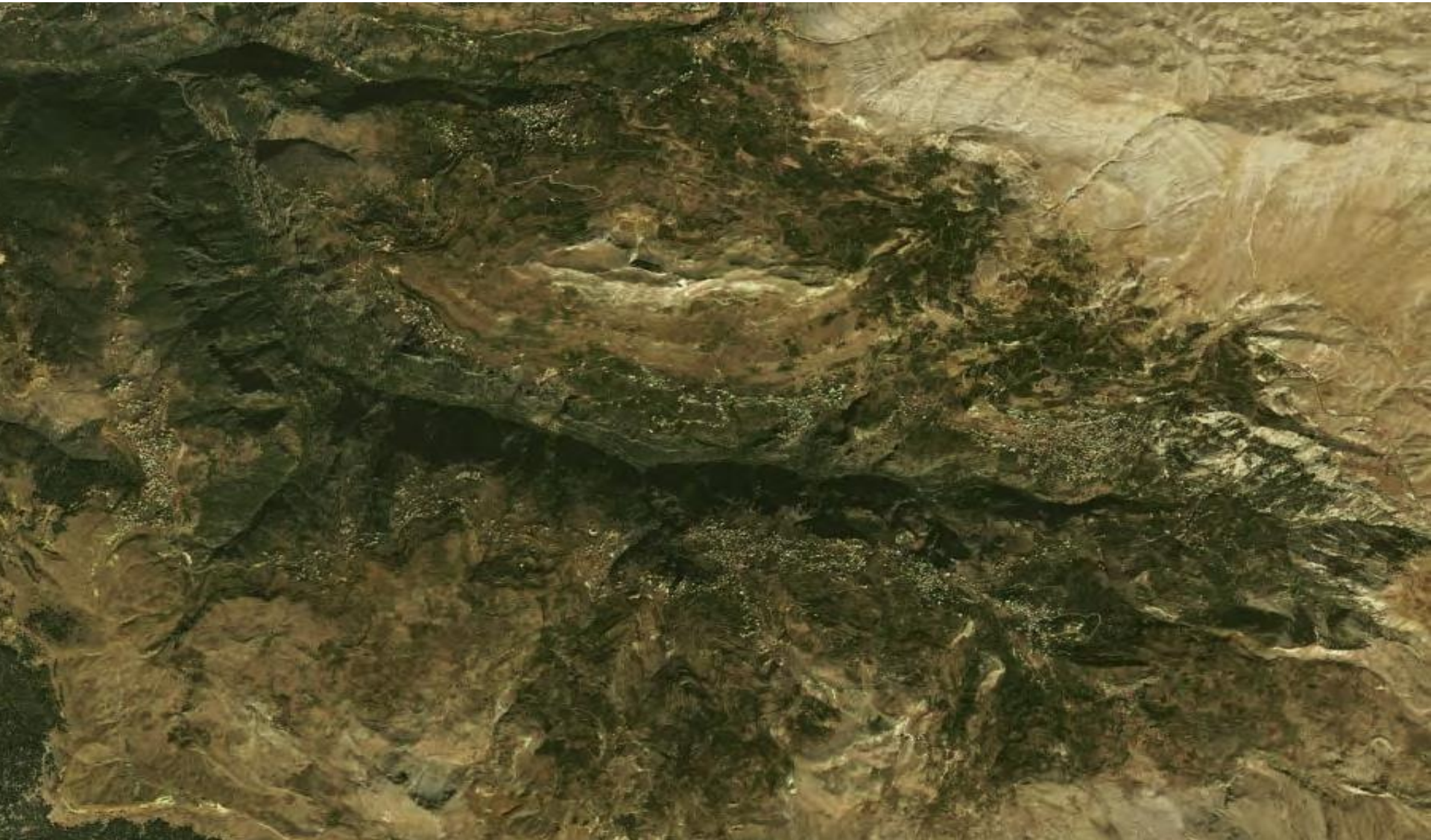
IMPLICATIONS

- To guide the decision-making process where safety and resource values are evaluated in terms of fire risk and appropriate fire management response strategies are identified for wildland fires.
- To provide a framework for fire management strategies through the use of specific fire mitigation actions.
- To provide a platform to cooperate more fully in planning and implementing wildland fire programs across the natural and cultural monuments

Qadisha Valley - Lebanon



**Satellite images of Qadisha Valley embedded
in the surrounding mountainous landscape
of northern Lebanon**



Abandoned terraces



The edge of Qadisha Valley is characterized by uncontrolled construction of houses



Traditional burning of candles on individual graves or cemeteries along the valley slopes are posing a source of ignition

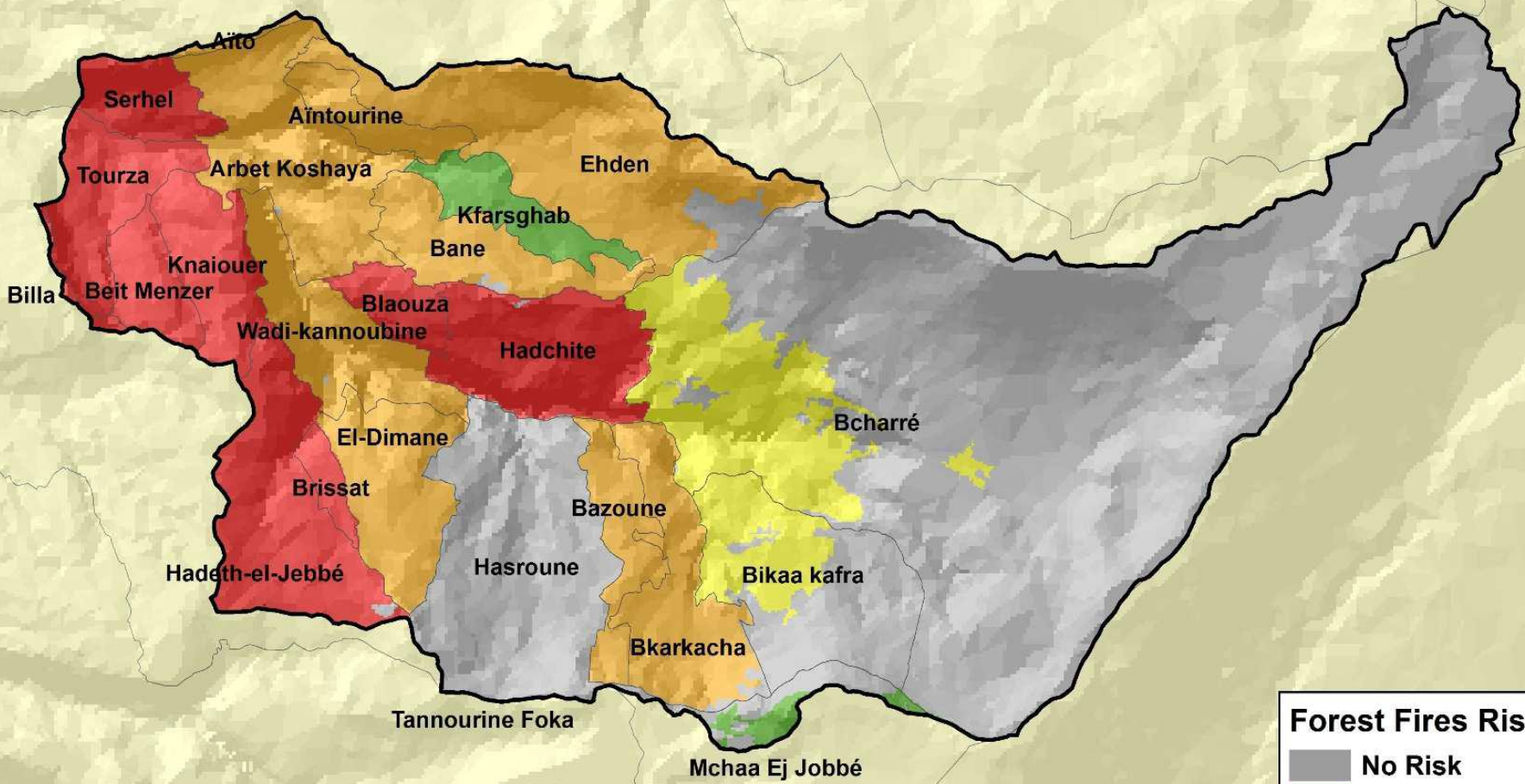


Abandoned terraces along the valley edges are often burned – without any supervisory control or a burning permit system in place.





Fire risk map for Qadisha Valley

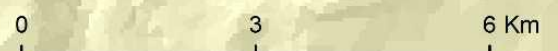


Legend

- Qadisha Valley
- Qadisha villages Limits

Forest Fires Risk:

- No Risk
- Very Low
- Low
- Medium
- High
- Very High





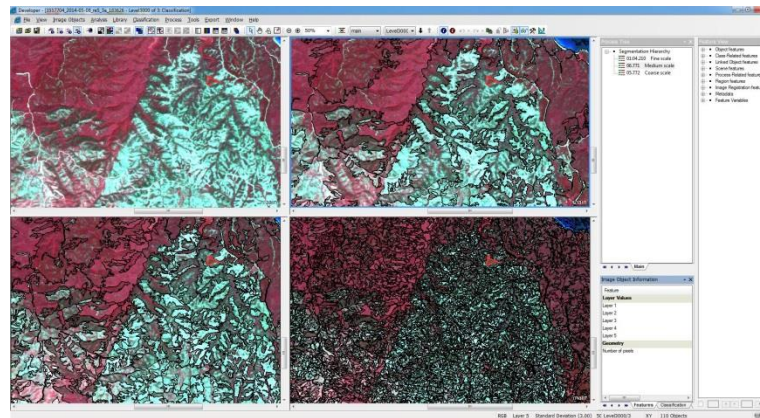
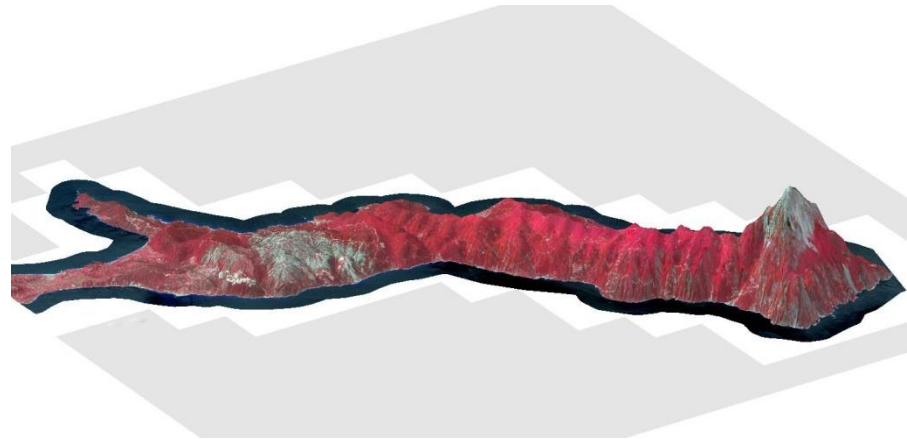
Mount Athos - Greece

Mt. Athos includes 20 monasteries and about 700 houses, cells, or hermitages surrounding by dense and flammable vegetation.

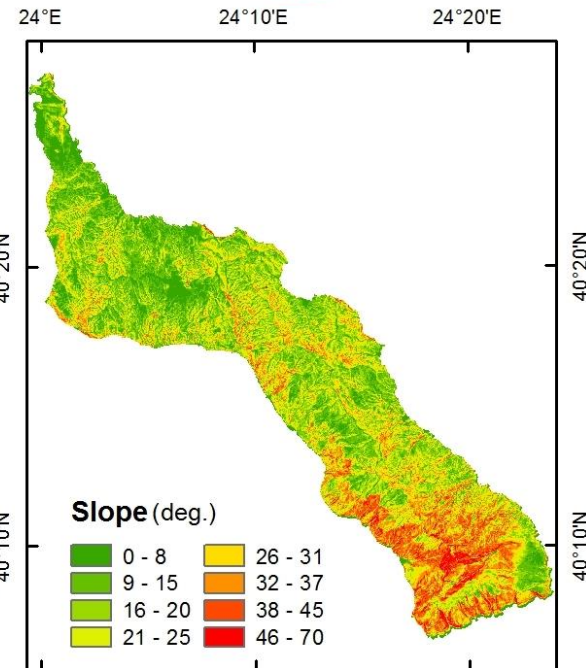
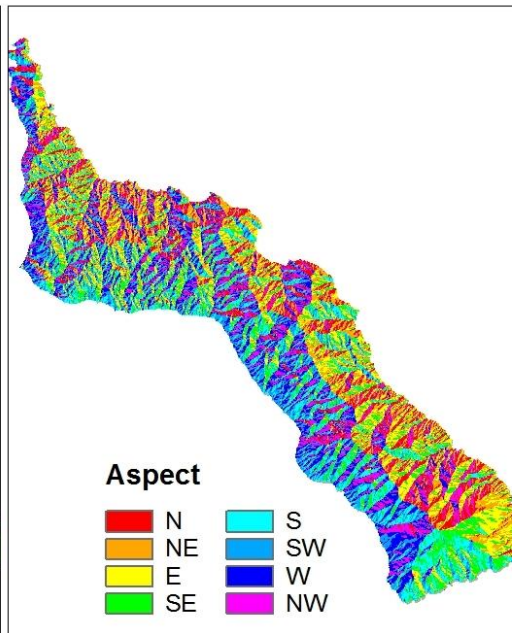
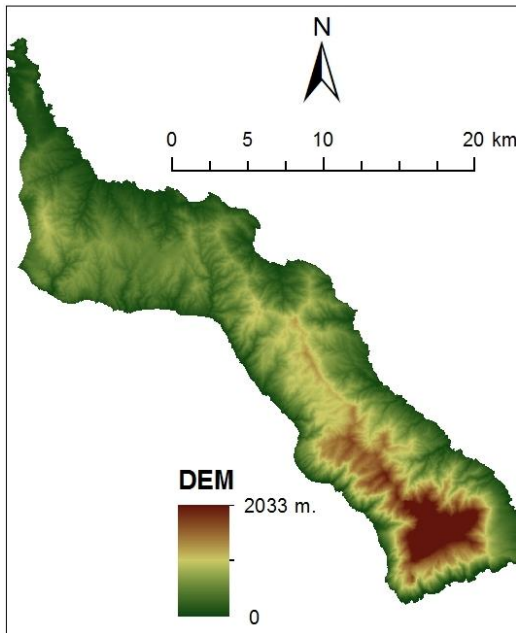


Landscape Fire Simulation Models

The complexity of fire risk management has led to a rapid increase in the application of fire behavior modeling & Earth Observation data



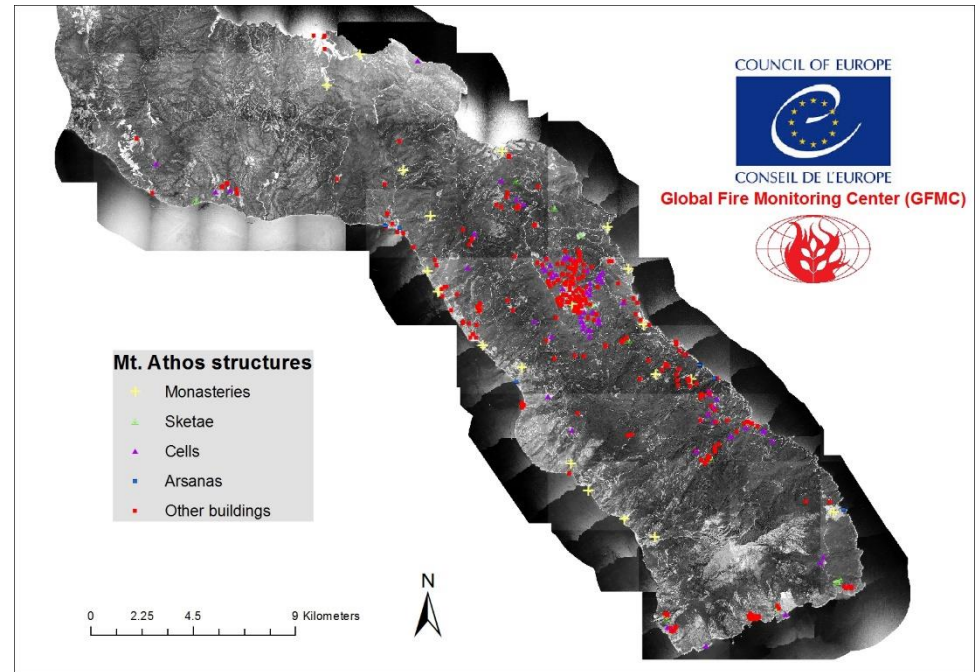
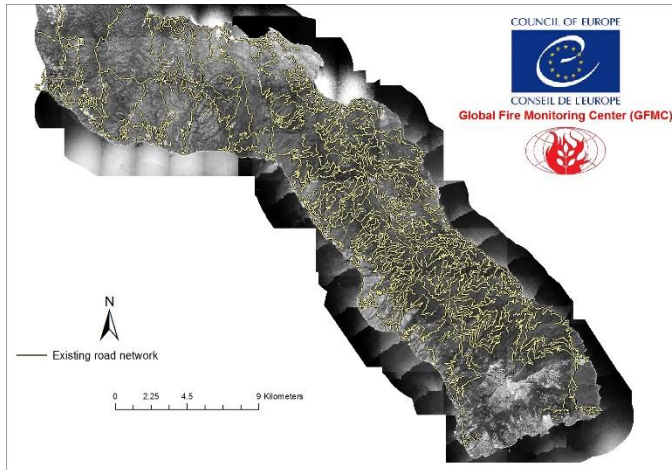
Ancillary datasets



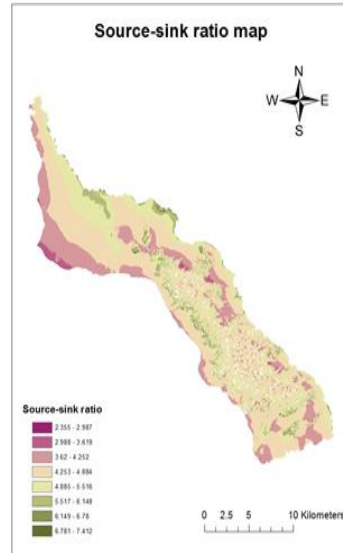
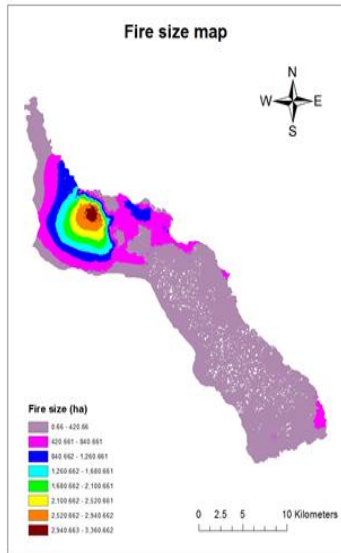
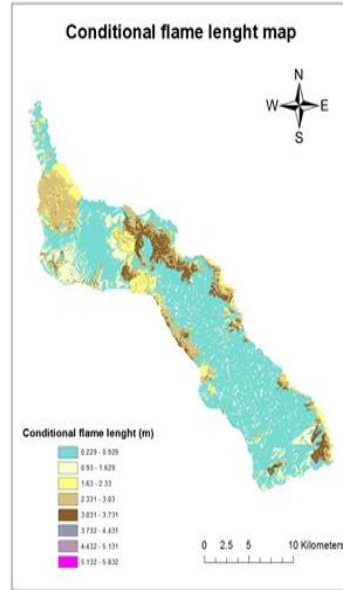
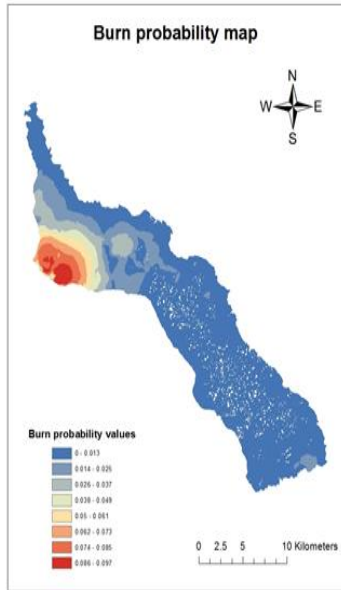
Ancillary datasets

Structure mapping

- High dispersion of structures
- Monasteries located mainly along the coast
- Cells and chapels completely immediate vicinity to dense vegetation



Road & Fuel breaks



Mt Athos monastery	Exposure to wildfire
Moni Esfigmenou	Low burn probability and high potential intensity
Moni Zografou	Low burn probability and high potential intensity
Moni Pantokratoros	Low burn probability and high potential intensity
Moni Stavronikita	Low burn probability and high potential intensity
Moni Dochiariou	Low burn probability and high potential intensity
Moni Ksenofontos	Low burn probability and high potential intensity
Moni Iviron	Low burn probability and high potential intensity
Moni Agiou Panteleimonos	Low burn probability and high potential intensity
Moni Batopediou	Low burn probability and low potential intensity
Moni Konstamonitou	Low burn probability and low potential intensity
Moni Koutloumousiou	Low burn probability and low potential intensity
Moni Ksiropotamou	Low burn probability and low potential intensity
Moni Filotheou	Low burn probability and low potential intensity
Moni Karakallou	Low burn probability and low potential intensity
Moni Simonos Petras	Low burn probability and low potential intensity
Moni Osiou Grigoriou	Low burn probability and low potential intensity
Moni Megistis Lavras	Low burn probability and low potential intensity
Moni Agiou Dionysiou	Low burn probability and low potential intensity
Moni Agiou Pavlou	Low burn probability and low potential intensity

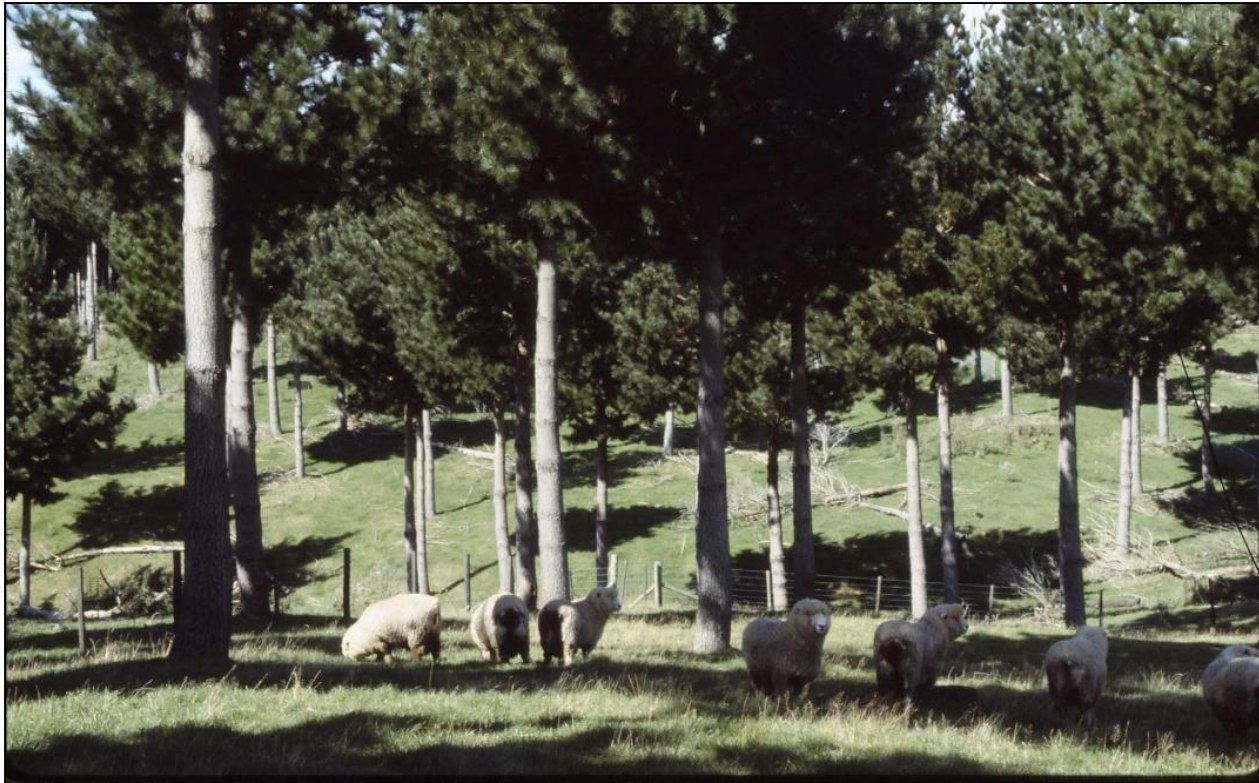
Concluding Remarks (I)

Reduced intensity of use of the productivity of our forests and open lands is leading to fuel accumulation and consequently to more intense and severe wildfires



Concluding Remarks (II)

The targeted use of prescribed grazing and the frame of combined silvo-pastoral land use has the potential to reduce damages such as those caused by uncontrolled overgrazing – and will contribute to the development to reduce the flammability and vulnerability of our landscapes to fire



Concluding Remarks (III)

In 2017 Israeli authorities apologized to its goats for having banned grazing for nearly seven decades, an enforcement that has decimated the pastoral traditions of Palestinian communities. The Israeli government appears to have finally conceded that, in an age of climate change, the threat of forest fires to Israeli communities is rapidly growing in the goats' absence.

In age of forest fires, Israel's law against Palestinian goats prove wound for Zionism

Jonathan Cook on December 1, 2017 69 Comments Adjust Font Size

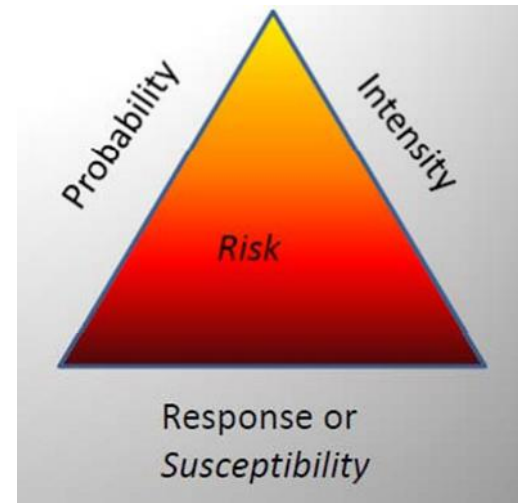


<https://mondoweiss.net/2017/12/israels-palestinian-inflicted/>

Concluding Remarks (IV)

Wildfire risk assessment in Cultural Heritage sites will allow us to:

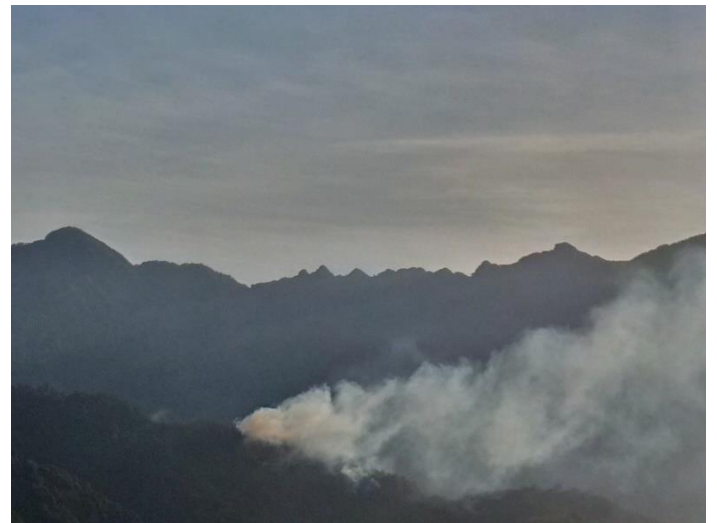
- ~ Identify the risk drivers
- ~ Identify leverage points
- ~ Evaluate fire mitigation strategies
- ~ Prioritize activities



Concluding Remarks (V)

- The proposed methodologies presents an integration of approaches for fire management planning across the landscape.
- The fire risk maps are the end product, and they can be fully exploited operationally by local fire management authorities
- Outputs created from these studies can be used as valuable components of judicial short and long-term wildland fire prevention and management in natural and cultural landscapes elsewhere in the world.

Ravello, 28-09-2018, 08:00





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Thank You for Your Attention



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