HELLENIC MINISTRY OF RURAL DEVELOPMENT AND FOOD
HELLENIC AGRICULTURAL ORGANIZATION "DEMETER"

Mitigation of Forest Fires in Greece

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Forest fire: a “recent” problem

- Forest fires are a natural phenomenon that has played a central role in shaping European landscapes for thousands of years.
- However, it only started being considered as a problem in the 20th century (Tedim et al. 2015).
- In the last forty years or so, it became a **serious** problem and a main issue every summer, especially in the Mediterranean countries of Europe.

Evolution of the forest fires problem in Greece

Until the late 1960s

- The Forest Service (GFS) was a key employer for the population of mountainous villages in reforestation projects, forest roads construction, anti-flooding control projects, etc. The people were thankful.
- There were no fire-trucks. Forest fires were fought by the local forest workers and other population (obligatory by the law) with guidance of GFS personnel.
- Key points: Use of hand tools, use of indirect attack when needed (including use of fire), knowledge of local conditions, discontinuous fuels, cleared agricultural cultivations, low forest fuel loads, population motivation

Reforestation works by the GFS in the 1960s, using female workers in rainy conditions.

Source: Archive of A. Kapetanios

Forest road construction by the GFS in 1950
(Lailias, Serres, N. Greece) Source: Archive of A. Kapetanios

Anti-flooding control dams construction in the 1950s in the prefecture of Serres. Source: Archive of GFS

From the 1970s until now

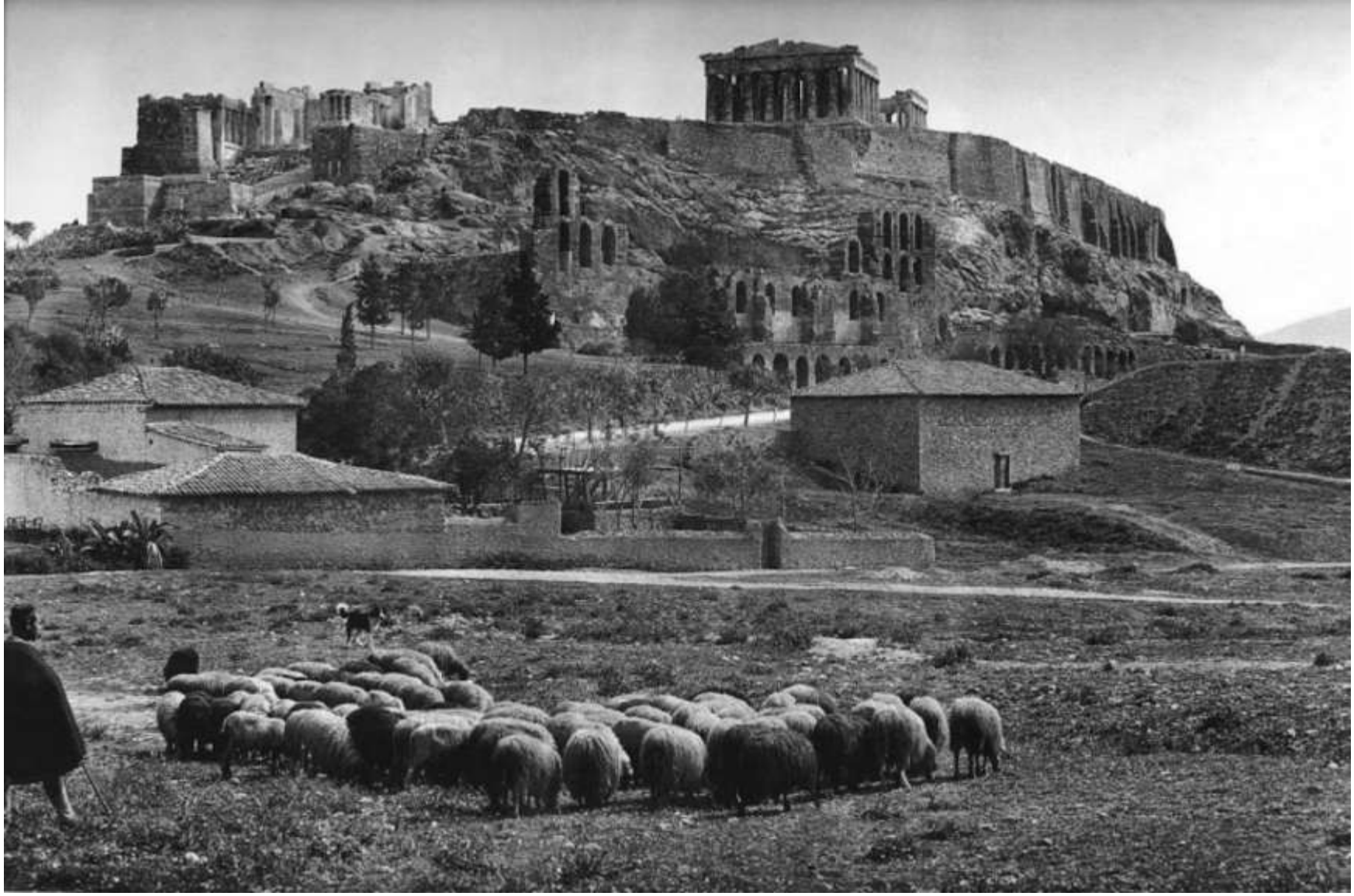
- Significant social and economic changes
  - Internal and international immigration
  - Reduction of capable hands
  - Agricultural land abandonment / EU subsidies
  - Forest Service decline
  - Fuel build-up (horizontal and vertical continuity / load)
  - Tourism development & creation of Wildland-Urban Interface areas (WUI) – Land issues
  - Grazing management issues
- Significant changes in firefighting
  - Firetrucks
  - Aerial resources

Forest Service reforestation project in Gortynia, Peloponnese

Lycabettus hill, Athens

1860

2006



Sheep grazing at the foot of the Acropolis in 1903

Photo: Fred Boissonas

The town of Vilia in Attica in 1956 (Source: Benaki Museum) and in 2006 (Photo: Christos Vonitsanos)

Resin tapping

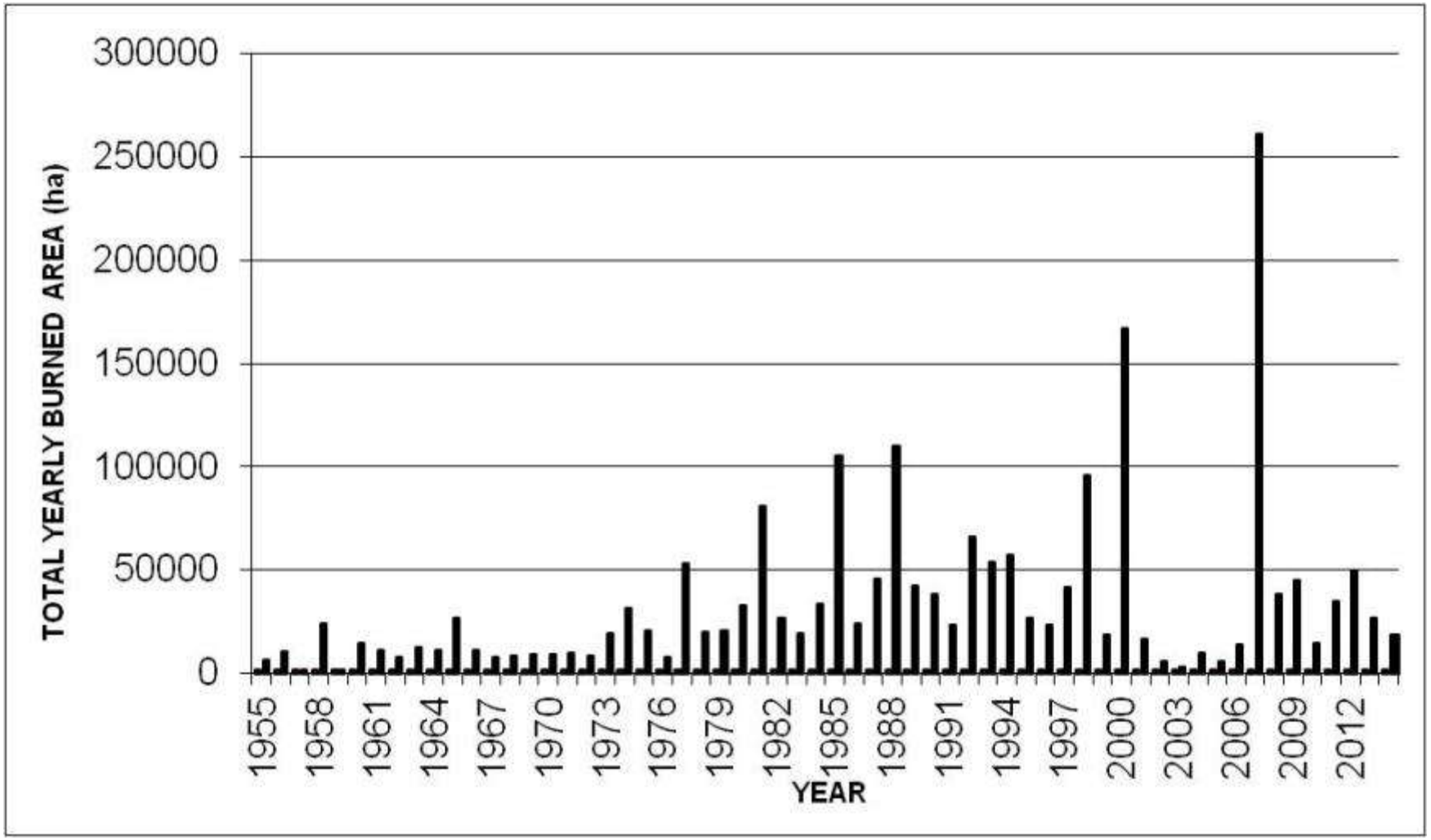
- Low elevation pine forests were mainly managed by resin tappers who achieved a satisfactory income from this activity
- They removed older/over-exploited trees creating openings for regeneration
- They maintained trails within the forests to facilitate access to the trees
- Furthermore, they protected the forests because they were their production and storage site.
- They kept an eye on any activity and acted immediately in case of fire to put it out.

Resin tapping on Evia island

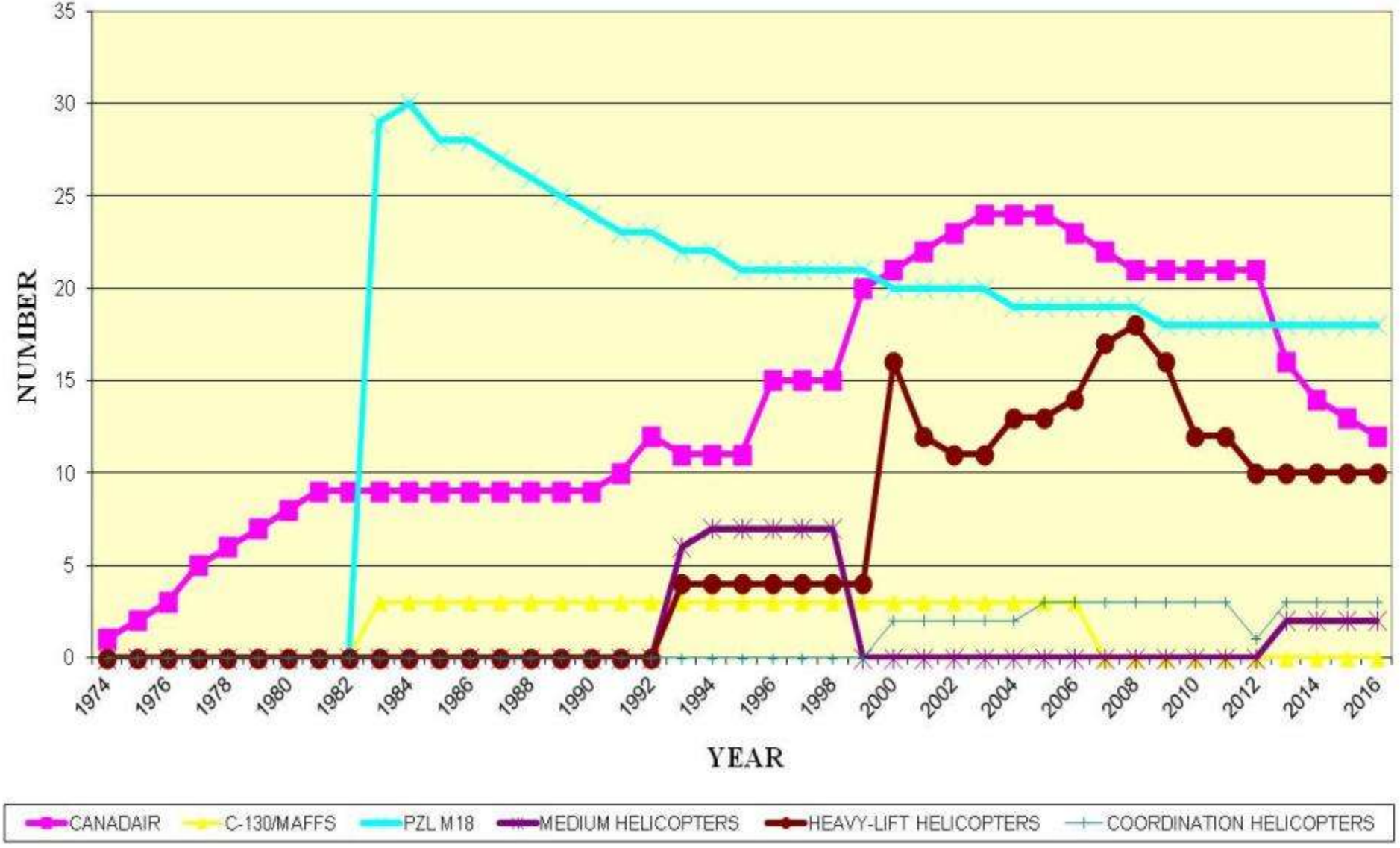
Strengthening of firefighting

- In 1998 forest firefighting responsibility was transferred to the Hellenic Fire Brigades (HFB)
- The number of HFB permanent employees increased from 6,500 to about 10,000 officers and firefighters
- About 5,000 seasonal firefighters are also employed every summer
- The number of fire trucks grew to more than 1,500.
- Ten (10) new Canadair CL-415 were added to the state owned aerial fleet of fourteen (14) CL-215.
- The HFB was allowed to contract large private helicopters

Yearly burned area evolution in Greece 1955-2014



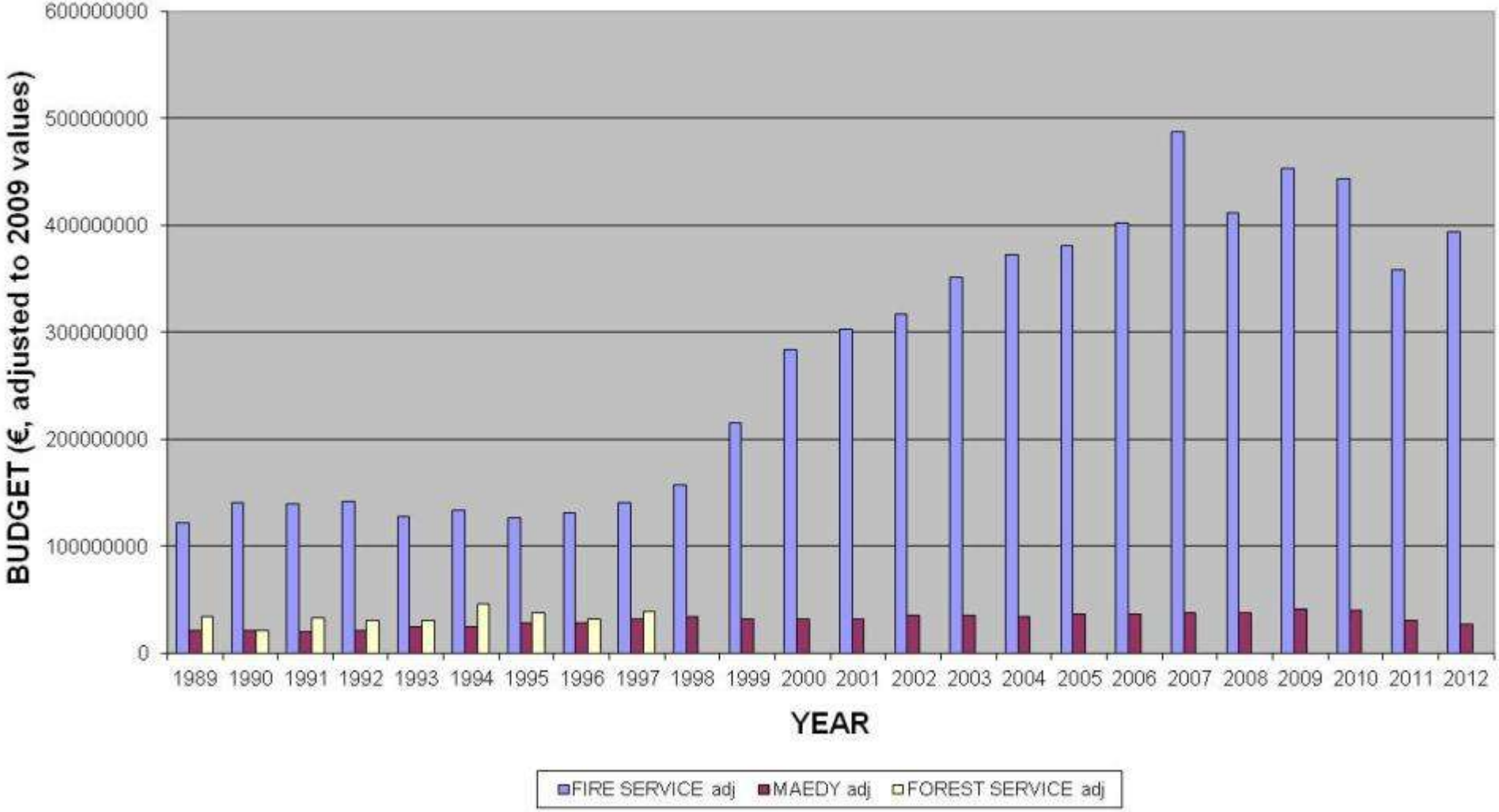
EVOLUTION OF AERIAL FIREFIGHTING RESOURCES IN GREECE



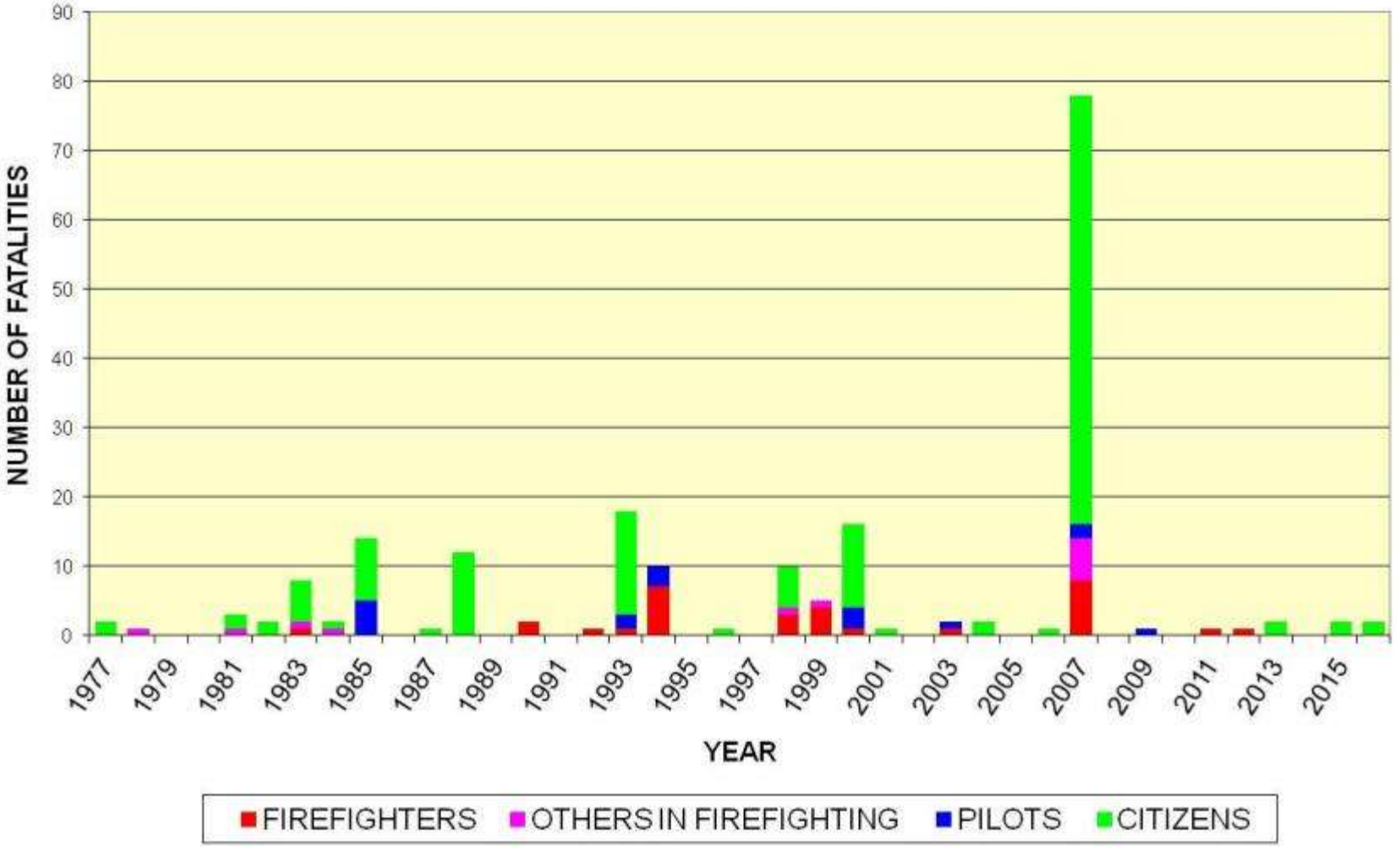
The results

- The total yearly costs of fire suppression more than tripled in the following years.
- The results were mixed: they were very good in the relatively easy fire seasons of 1999, 2001, 2002, 2003, 2004 and 2005 but in the summer of 2000 which was hot and dry the burned area reached an all time high, about 160,000 ha.
- Then came the disastrous 2007 fire season....
- This can be explained mainly by the massive aerial initial attack that has become the basic principle of the HFB operational procedure.

FIRE SUPPRESSION BUDGET EVOLUTION (1989-2012)



Forest fire fatalities in Greece



- No fires recorded between 1916 and 1977

The era of large fires

- Thus Greece entered the era of large fires!
- The strong fire suppression mechanism is able to control most fires with heavy support of aerial resources.
- However, under difficult conditions, the continuity and amount of fuels increases the probability of initial attack failures.
- Fires escaping initial attack are usually controlled with heavy aerial support.
- However, if many fires escape initial attack simultaneously, so that there are not enough aerial resources, the overall situation can easily get out of control.
- The need for serious mitigation measures is obvious!

Mitigation (Definition)

MITIGATION: The elimination or reduction of the frequency, magnitude, or severity of exposure to risks, or minimization of the potential impact of a threat or warning.

Mitigation of the forest fires problem in Greece

- We need to act on:
  - Reduction of the number of human caused fires
  - Reduction of the intensity of fires
  - Reduction of the potential for fire caused damages
  - Improvement of prevention and presuppression planning
  - Firefighting effectiveness and efficiency improvement
  - Better post-fire rehabilitation of burned areas
- All these need to be done under very strict budget constraints

Reduction of the frequency of human caused fires

- Need for reliable fire statistics and in-depth analysis to understand the causes
  - Improved fire investigation
  - Better application of justice
- Need to act on the causes in various ways (legal changes, technical measures, school education, sensitization of the public, PR) aiming at avoidance of coincidental fire starts, removal of conflicts and deterrence of arson.
- Reliable fire danger prediction and good use of the predictions

Reduction of the intensity of fires

- Need to act on fuels
- Creation and maintenance of a very dense network of firebreaks and fuelbreaks is not recommended

- Should aim at better utilization of forest biomass (active forest management, timber, energy and forage production) and good agricultural practices in areas neighboring or within forests

Reduction of the potential for fire caused damages

- Make existing houses and infrastructures safer, especially in WUIs and RUIs by:
  - Managing fuels (quantity, continuity, distance)
  - Clever landscaping around structures
  - Building with careful design and fire resistant materials
  - Creating appropriate infrastructures (fire hydrants, water tanks, road network, etc.)
  - Preparing people on what to do in case of fire
- Planning well for new WUI developments
- Aim to achieve safer agricultural areas

Improvement of prevention and presuppression planning

- Fire prevention should be a year-round operation
- The cornerstone should be a good prevention plan
- It should be based on a careful threat analysis:
  - Statistics analysis to identify the fire causes, the reasons behind them and their distribution
  - Spatial analysis to identify priorities for intervention
- It should foresee measures according to the analyses, identifying funding sources, personnel and timing
- A good presuppression plan should be part of the prevention plan

Firefighting effectiveness and efficiency improvement

- The HFB must rely less on aerial firefighting resources. This will require:
  - Choosing and contracting aerial resources more carefully
  - Using them more efficiently (improving dispatching, training officers on how to best use them)
  - Improving training (and retraining) of personnel
  - Rethinking tactics, stressing effective initial attack, being better prepared to fight large fires (e.g. forming specialized command teams, resorting more often to indirect attack, and approaching forest firefighting as a guerilla war rather than as direct confrontation)
  - Adopting “new” tools (helicrews, handtools, use of fire to fight fire, technology….) to enrich available options.
  - Maximizing cooperation with other entities

Better post-fire rehabilitation of burned areas

- Careful and timely application of measures, only where needed, based on specific criteria and scientifically based measures
- Aim at creating resilient territories in order to reduce the probability for future disasters
- Avoid creating incentives for future fires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ΕΓΧΕΙΡΙΔΙΟ ΕΦΑΡΜΟΓΗΣ

Μέθοδοι και Σχεδιασμός Αποκατάστασης
των Δασικών Οικοσυστημάτων και Τοπίου
μετά από Φυσικές Καταστροφές ή άλλες Επεμβάσεις

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How to do it

- An emphasis on fire prevention is required.
- A permanent working group for prevention, including representatives of all relevant organizations and specialized scientists, must be established, supported and funded
- Citizens need to be involved in all aspects of prevention with special emphasis on preparing their properties for the case of fires.
- The GFS needs to be strengthened and to contribute to overall forest fire management.
- It must invest in forest management again, providing jobs, producing timber and other goods and making the forests less vulnerable to fire.

How to do it (2)

- In regard to firefighting, in addition to HFB improvements:
  - Volunteer groups, armed forces and municipality resources must start being used effectively.
  - International assistance in times of extreme fire load needs to be incorporated in the planning.
- In the long-term the objective should be to improve management of the territory, creating more wealth for local populations through production of timber, energy, and other non-wood forest products, making sure this is done in a sustainable, scientifically sound and environmentally friendly manner.
- This means informed politics and long-term commitment

How to do it (3)

Requirements:

- Policy changes (new paradigm)
  - A system that will ensure effective cooperation of all organizations should be put in place.
  - The National Incident Management System (NIMS) of the USA may be offer some good ideas and examples
- The new paradigm needs to introduce:
  - Regular assessment of results and corrective actions where and when needed
  - Emphasis on flexibility and maximum efficiency
  - Best use of science & technology

Thank you