

# **Findings and Conclusions of the Second International Symposium on Fire Economics, Planning, and Policy: A Global View**<sup>1</sup>

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## **Introduction**

During this symposium we had the opportunity to exchange ideas regarding the economics of fire management, and to share the latest in development and technologies available for optimizing fire management expenditures. We heard representatives from public fire management agencies in Chile, Mexico, Spain and the United States of America give us a regional and global vision of the forest fire problem in four major regions of the world: South America, Mexico and Central America, Europe and North America. Together with a presentation on global vegetation fire trends by the Global fire Monitoring Center these four presentations set the tone for the whole symposium and highlighted many of the common concerns with the problems of wildland fires throughout the world. Some of the most prominent reasons presented for the continuous and increasing wildland fire problem were related to social and economic factors such as poverty in rural areas, particularly in developing countries economies, and abandonment of the rural areas. A related problem is the population increase and higher concentrations along forested areas, creating the new coined problem of the wildland urban interface (WUI). This problem is not prevalent in developed economies of the west, although not exclusive of developed countries. Another significant concern affecting negatively the problem of wildfires is changes in forestry policies. Other significant contributors to the problem are changes in global weather patterns, changes in land use patterns, and fire exclusion policies.

It was also evident from these regional presentations that the costs associated with the wildland fires problem and fire management programs are substantial ranging in the billion of dollars. For example, since 2000, the United States Department of Agriculture Forest Service (USDAFS) alone has spent more than \$1 billion annually in forest fires suppression. Canada spends an average of \$400 to \$800 million annually. Neither of these figures includes timber, health, recreation or

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personal property related expenditures. In the South American continent losses are estimated as high as \$1.6 billion annually. Recent estimates of the impacts of the Indonesian fires of 1997-98 on the economies of Indonesia, Malaysia, and Singapore were as high as \$10 billion. The long-term damage caused by net transfer of carbon to the global atmosphere as a consequence of excessive burning and reduced carbon sequestration capacity in the Russian Federation have recently been assessed to be in the magnitude of \$5 billion per year.

The problem is not any simpler in terms of the land area affected. In the US an average of close to 2 million hectares of forest lands annually have been affected. In Canada the equivalent amount is 2.5 million hectares. During 1998, 2.3 million hectares were affected in Mexico and Central America. When added to the 5.3 million hectares of agricultural burns in the area the total jumps to 7.7 million hectares. In the South American continent more than 3 million hectares burned on average during the 1990s. On average Europe burns more than half million hectares of forest and non-forest land annually. During 2003, Portugal alone burned more than 450,000 hectares of forest lands; France's average annual area burned increased by more than 30% from the 90s decade; the Russian Federation burned 23.7 million hectares, and Australia lost more than 60 million hectares! Worldwide estimates are that more than 350 million hectares of forest lands are burned annually.

In response to the overwhelming evidence of the magnitude of the problem the presentations and discussion following the regional overview dealt with the topic of strategic fire management planning. Divided into three sessions authors presented different approaches used by several world organizations to best plan their forest fire protection programs. Presentations varied from developing a global wildland fire strategy to specific planning techniques for individual countries from Chile to the USA, and to Europe. Some had developed models for allocating fire fighting resources using Geographic Information Systems, other developed tools for strategic budget processes for initial attack response. Experiences and models from different parts of the world were presented and discussed.

The wildland fire program has been traditionally discussed in terms of fire ecology and fire management but by and large not from the perspective of its economic dimension. Two full sessions were devoted to the fire economics issues. Nonmarket valuation techniques were presented on how to include nonmarket values information into strategic fire planning. The economic implications of wildfire management were discussed and some "myths" about fire management presented. The cost and benefits of the application of prescribed burning as a tool for sediment reduction was presented among others.

Sustainability of fragile and non fire dependent ecosystems is threatened by catastrophic fires. These fires also affect large expanses of forest plantations. A session was devoted to discuss the relationship between forest fires and sustainable forest management. Examples from Spain and Chile highlighted the difficulties in trying to practice sustainable forestry while confronting wildland fire problems of the magnitude presented here.

The regional presentations made clear the importance of public policies in shaping government agencies response to the problem of wildland fires. At the same time these policies affect the manner in which society reacts to the established programs. The issue of wildland urban interface was discussed extensively as one

that is shaping the new approaches public agencies at the local, regional, and national level will use in establishing wildland fire management programs. The factors that affect the views of homeowners about wildfire hazard and fuels management were also discussed.

There is common held believe in the wildland fire community that increasing the level of forest fuels treated by prescribed burning activities would decrease fire suppression expenditures. A full session was devoted to this topic with mixed results. Results show that there are analytical problems in assessing treatment effectiveness and these may be compounded by deficiencies in the type of data typically collected by public agencies. Other problems are related to the relatively scant information available on treatments applied on a landscape scale.

## **Problems Identified**

After three intense days of presentations the following list of problems were identified as having a significant impact on the wildland fire problem.

1. Socio-economic
  - a. Poverty in rural areas
  - b. Abandonment of rural areas
  - c. Population increases and concentration in urban areas
  - d. Shift in forestry policies
  - e. Wildland urban interface
  - f. Low forest land values
2. Programmatic
  - a. Lack of clear, and sometimes conflictive policies
  - b. Lack of continuous well financed prevention and education campaigns
  - c. Lack of coordination (local, regional, national, and international levels)
  - d. Lack of fire management programs funds
  - e. Lack of good information databases
  - f. Lack of fire insurance programs
3. Political
  - a. Lack of political will to promote effective forest protection
  - b. Lack of community involvement
  - c. Agricultural policies resulting in agricultural burns being a major agent of forest fires.

## Conclusions

From this list of problems the following conclusions were reached:

1. Increasing fire severity observed in many regions as a consequence of direct and indirect impacts of human interference and environmental change
2. Different regions experiencing the consequences of fire suppression or reduced fire use, with its impacts on biodiversity, carrying capacity, landscape patterns, etc.
3. Alarming trend of fire-induced carbon transfer from the terrestrial sphere to the atmosphere, especially from drained or climatically altered wetlands
4. Main cause of fire is agricultural burning
5. Globalisation of markets influences fire use and fuel loads
6. The wildland/urban interface problem is growing rapidly requiring a new paradigm for a workable solution
7. Larger and more expensive fire suppression organizations are not necessarily the answer.
8. Preventive silviculture programs & education programs in urban and rural areas may not be enough, without adequate funding
9. Community involvement programs are necessary (integrated fire management—social, ecological, economic and operational issues)
10. Economic analysis of forest fires protection programs is essential (including valuation of fire impacts)
11. Development of a wide-reaching system of personnel certification and qualification is needed
12. Establishment of cooperative agreements at the local, regional, national & international levels is necessary
13. New policies are needed to deal with:
  - a. abandonment of rural areas
  - b. poverty in rural areas
  - c. wildland/urban interface issues
14. Development of national databases
  - a. Fire history
  - b. Intentional fires (arsonists profile)
  - c. Fire costs (local, regional, national)
  - d. WUI (definition of term, inventory by country, structures lost, economic impact)
15. Research needs
  - a. Social, economic, and human behavior studies in fire awareness
  - b. Home and safety research in WUI

- c. Proportion of budget needed for fire education, prevention to achieve reduction in number of fires
- d. Verification of global (country) remote sensing data (total area burned, fire history, etc)
- e. Use of fuel treatments to reduce fire hazard and occurrence
- f. Economic impacts of forest fires

In closing the general consensus of the audience was that this kind of international conference dealing with issues of fire economics, planning and policies should be continued on a regular schedule. It was recommended that the next symposium be scheduled for 2008.

