FOREST FIRE MANAGEMENT: A RISK MANAGEMENT PERSPECTIVE

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Friday Forum
Institute for Catastrophic Loss Reduction

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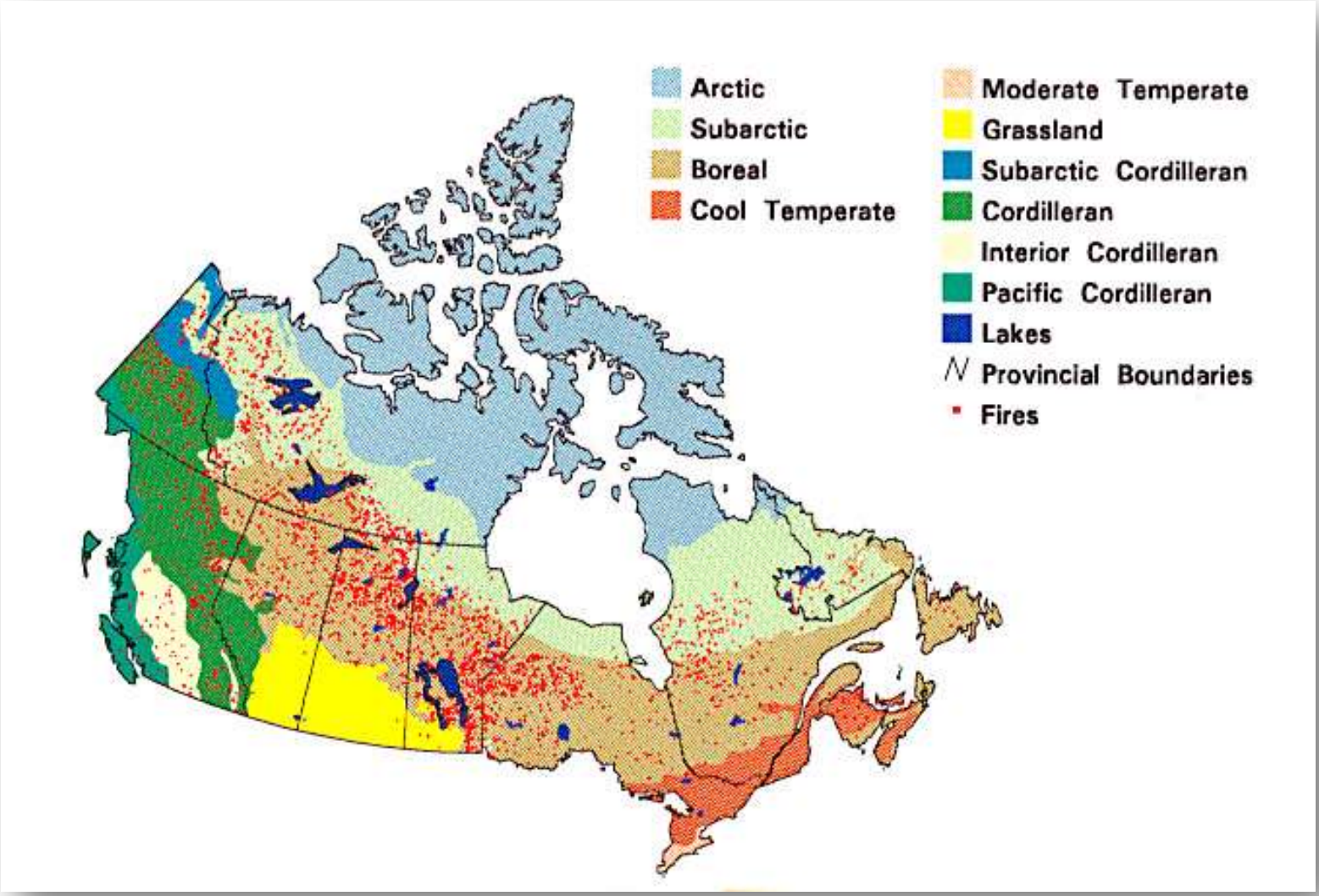
SLK 35 2011 Ontario Ministry of Natural Resources

Fire common across Canada

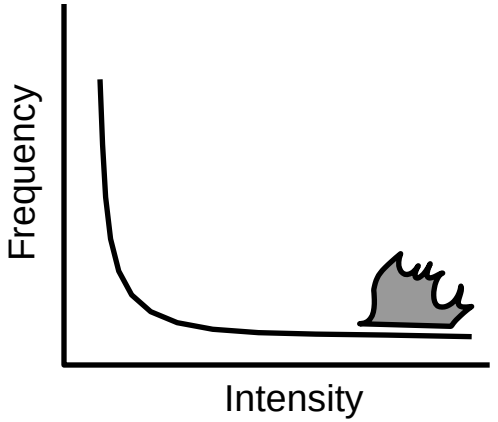


A very intense crown fire

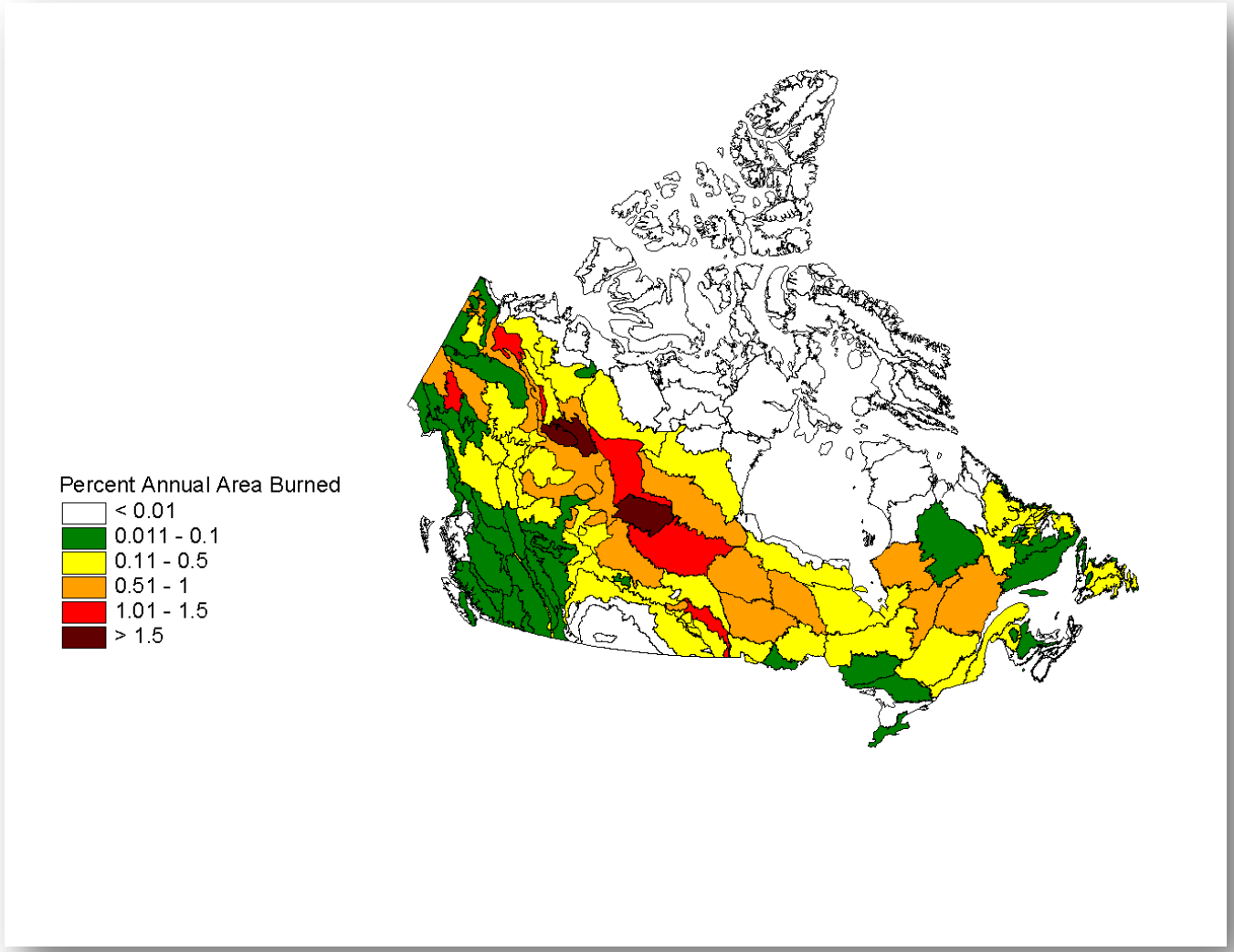
Canadian Forest Service

Fires vary in size and intensity across the landscape

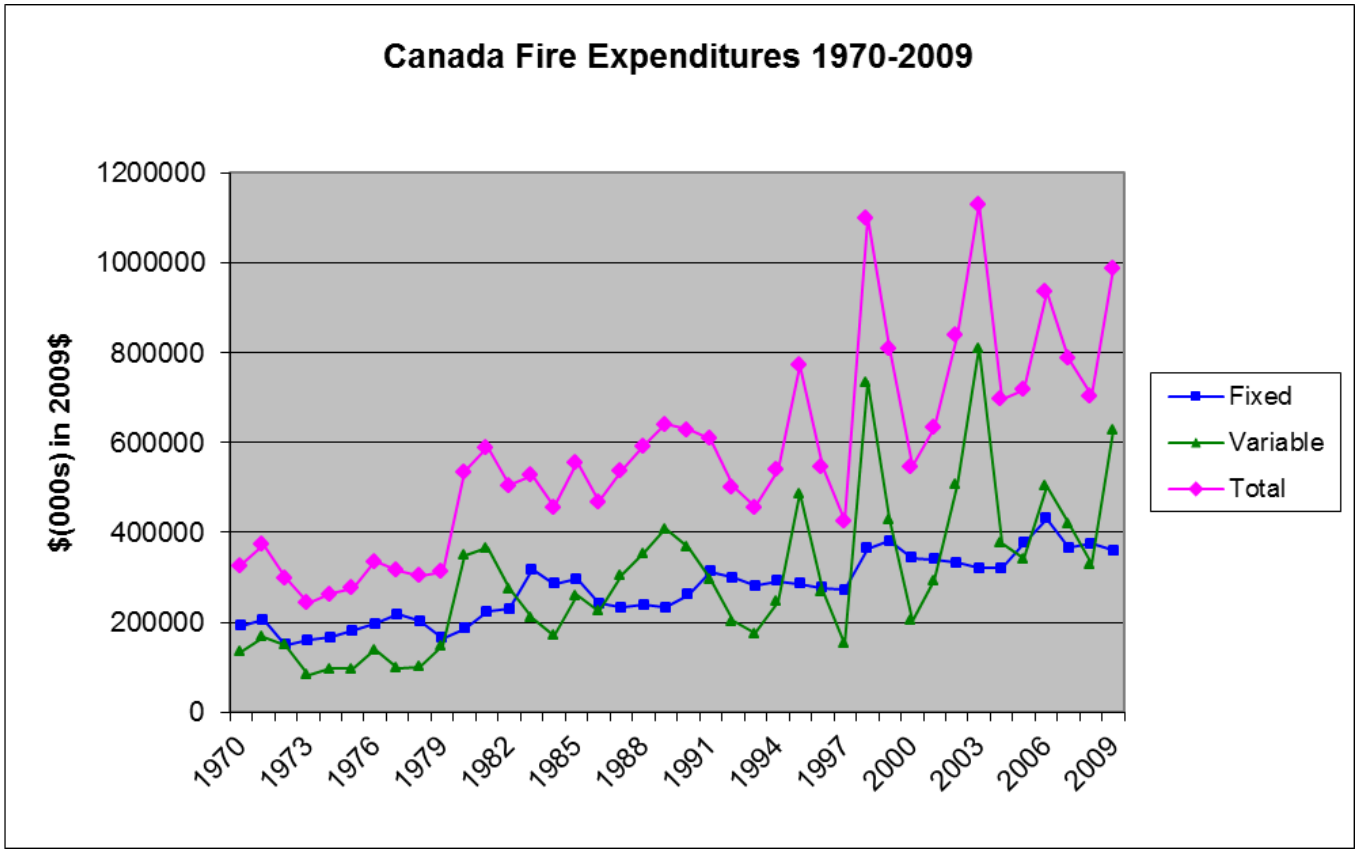
Ontario Ministry of Natural Resources



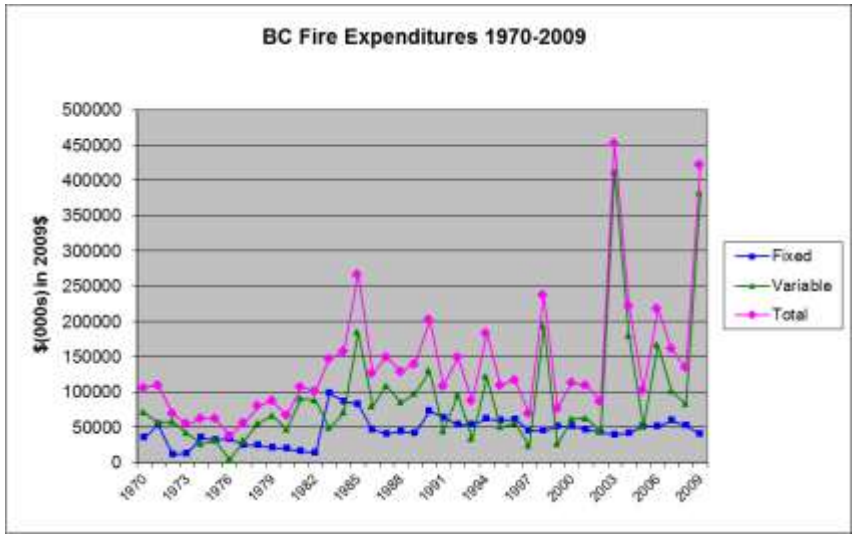
Burn rate by ecoregion

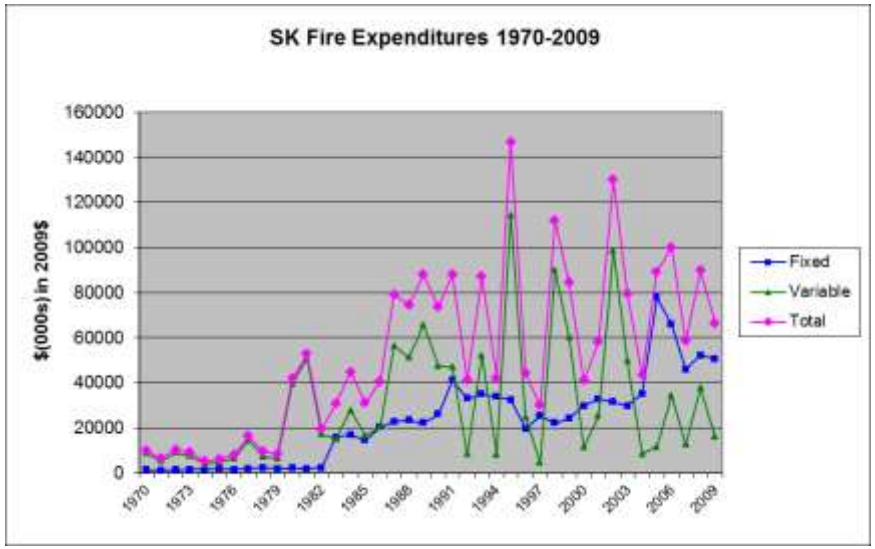


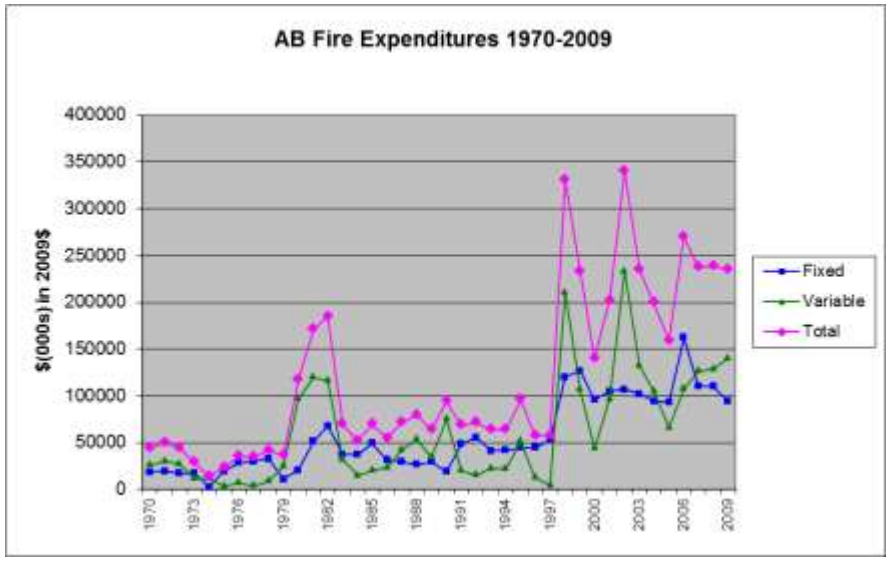
Fire management expenditures in Canada

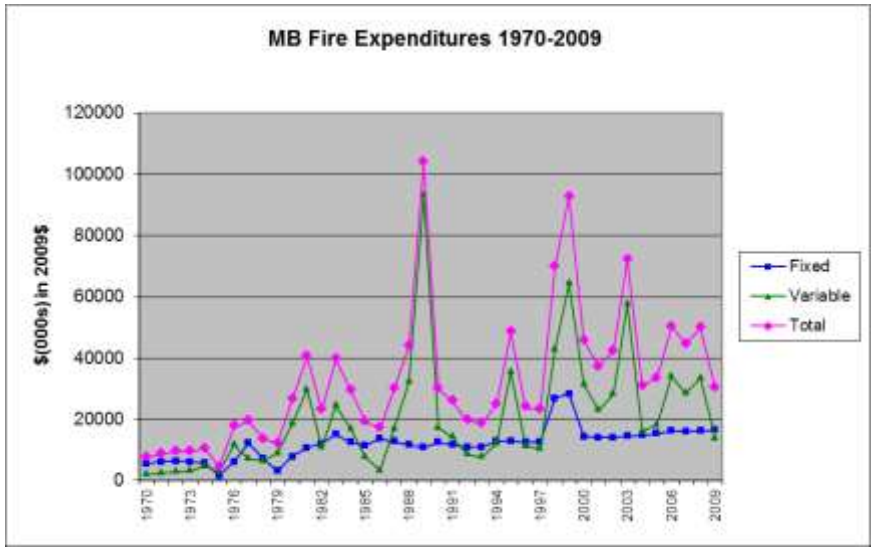


Western Canada

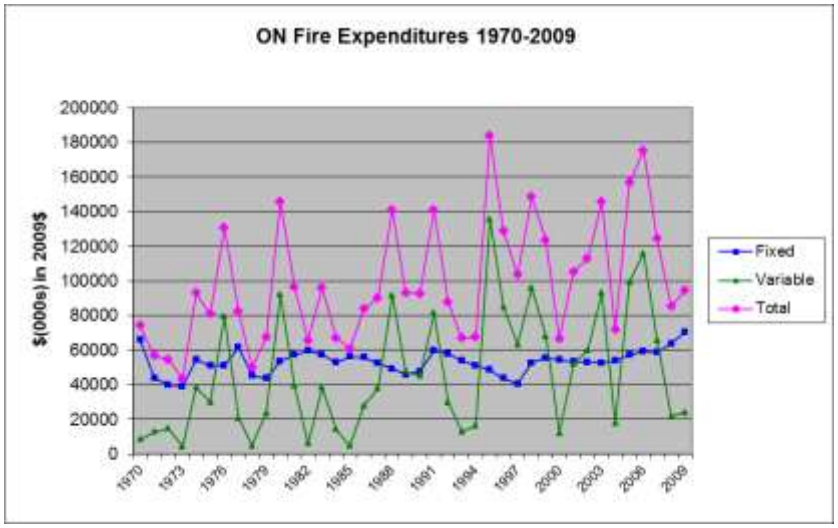


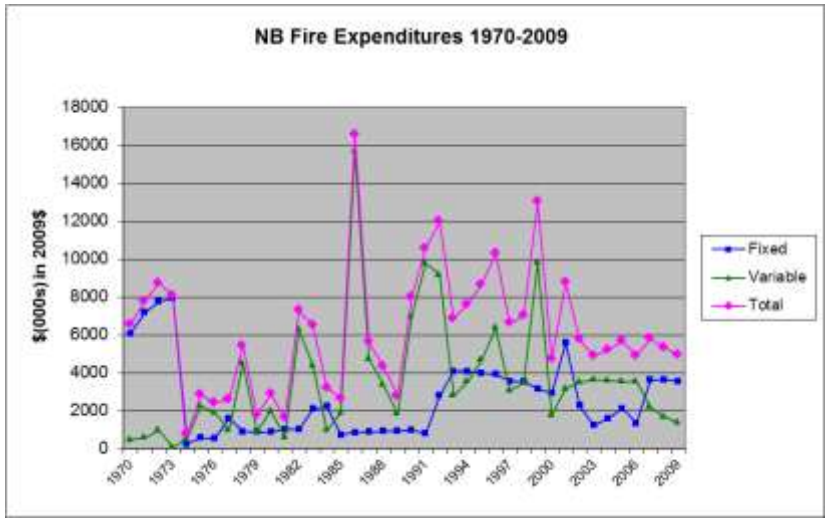


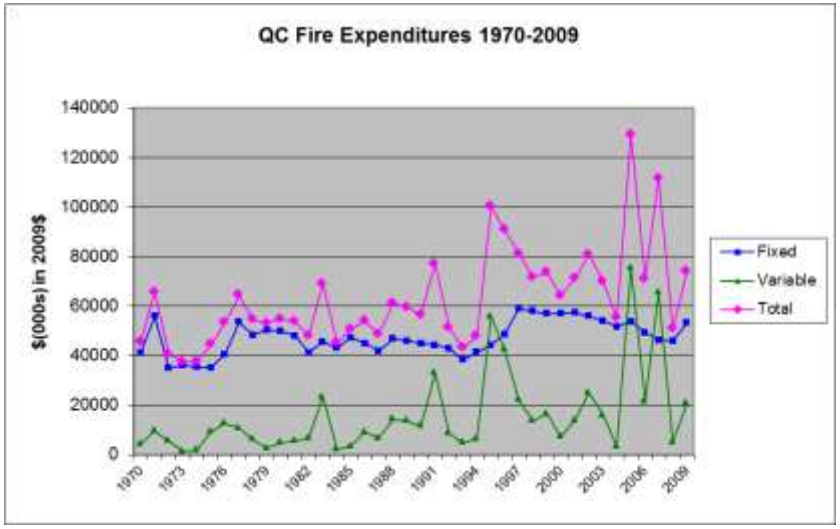


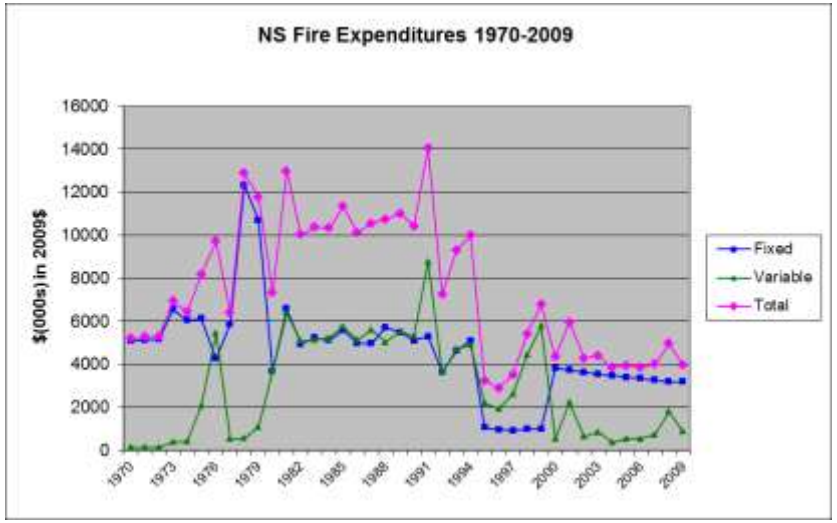


Central and Eastern Canada









Risk management from an insurance perspective

Forest and wildland fire is a source of claims for the insurance industry

Forces the evacuation of communities due to smoke and the threat of fire itself

Burns homes, cottages, privately owned timber and forest harvesting equipment

Estimated insured loss of $700 million in and near Slave Lake Alberta in 2011

Commercial and industrial supply chain disruptions

Highway and railway closures

Mine closures

Suspension of forest harvesting and transportation operations

Hydroelectric transmission networks, oil and gas pipelines, telecommunication towers, fibre optic cables

Forest closures that impact forest recreation and tourist outfitters

Disruption of commercial activities in evacuated communities

Fire a natural forest ecosystem process

B.J. Stocks, Canadian Forest Service

Fire threatens

Ontario Ministry of Natural Resources

Public safety

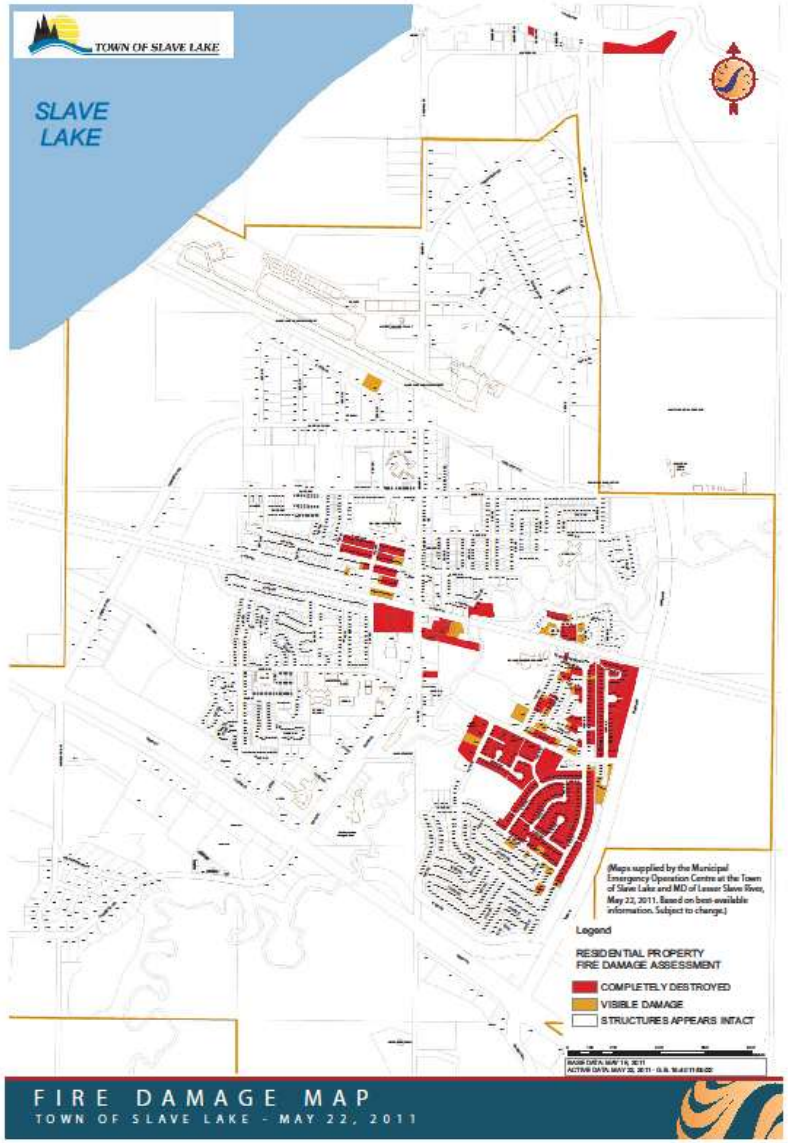
Property

Slave Lake Alberta 2011

Helicopter pilot lost his life

485 homes and businesses destroyed

7,000 people evacuated



Some notable incidents in Ontario

Fire management initiated in Ontario in part, in response to the Porcupine fire (1911, 73 lives, 200,000 ha), Matheson fire (1916, 273 lives, 2,000 km^2), Haileybury fire (1922, 43 lives, 18 townships)

Many First Nations communities in Northwestern Ontario were evacuated in 2011

Timmins and Kirkland Lake were threatened in 2012

Fire destroys timber

Fire does not destroy forests

Kenora 23
1980

Kenora 23
2001

The wildland fire management challenge

Fire destroys people, property and trees

Fire does NOT destroy forests

Ontario Ministry of Natural Resources

To what extent and how should we tamper with nature ?

Fire management is risk management writ large on regional, provincial and national scales

Fire management

Fire management is no longer just about suppression

Deliver the right amount of the right fire to the right place at the right time at the right cost

"Right" should determined by the social, economic and ecological objectives which vary over both time and space

Difficult problems for which there are few simple answers

Overview

Fire management in Ontario

Risk-related forest and wildland fire research

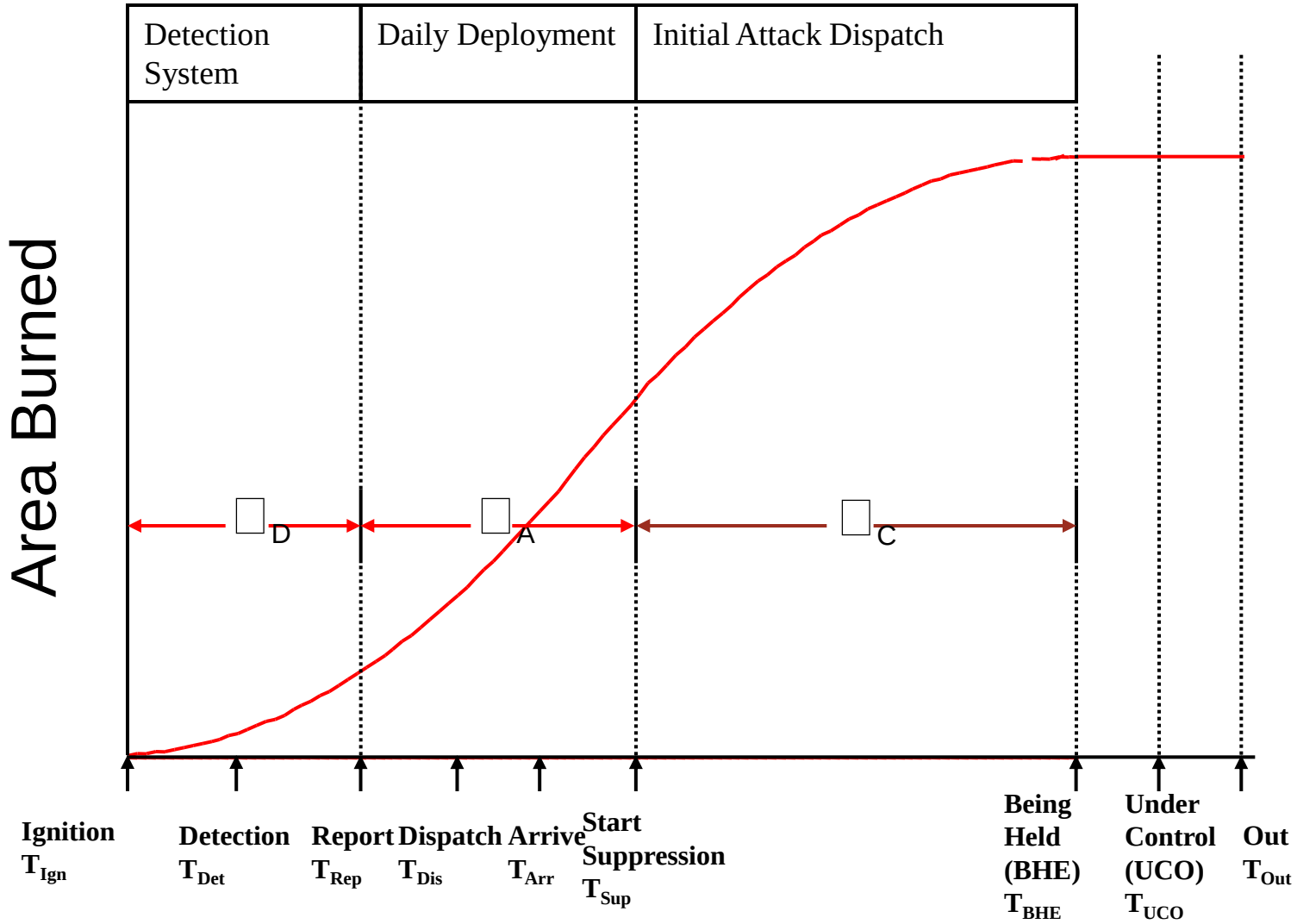
Share some concerns about the future

A role for the insurance community?

Fire operations in Ontario

Ontario Ministry of Natural Resources

Life cycle of a managed fire



After Parks, G.M. 1964. Man. Sci.

Fire suppression resources

Ontario Ministry of Natural Resources

Fire fighters

Airtankers

J. Beck, British Columbia Ministry of Forests

Transport aircraft

J. Beverly

Trucks

Mitch Miller, Ontario Ministry of Natural Resources

Helitorch

Daily fire operations

Predict when and where fires are likely to occur

Route detection patrol aircraft

Deploy airtankers, fire fighters and transport aircraft close to areas where fires are likely to occur

Dispatch initial attack forces to contain fires while they are small

Deploy large incident management teams (IMTs) to contain escaped fires that pose threats

Fire management systems research

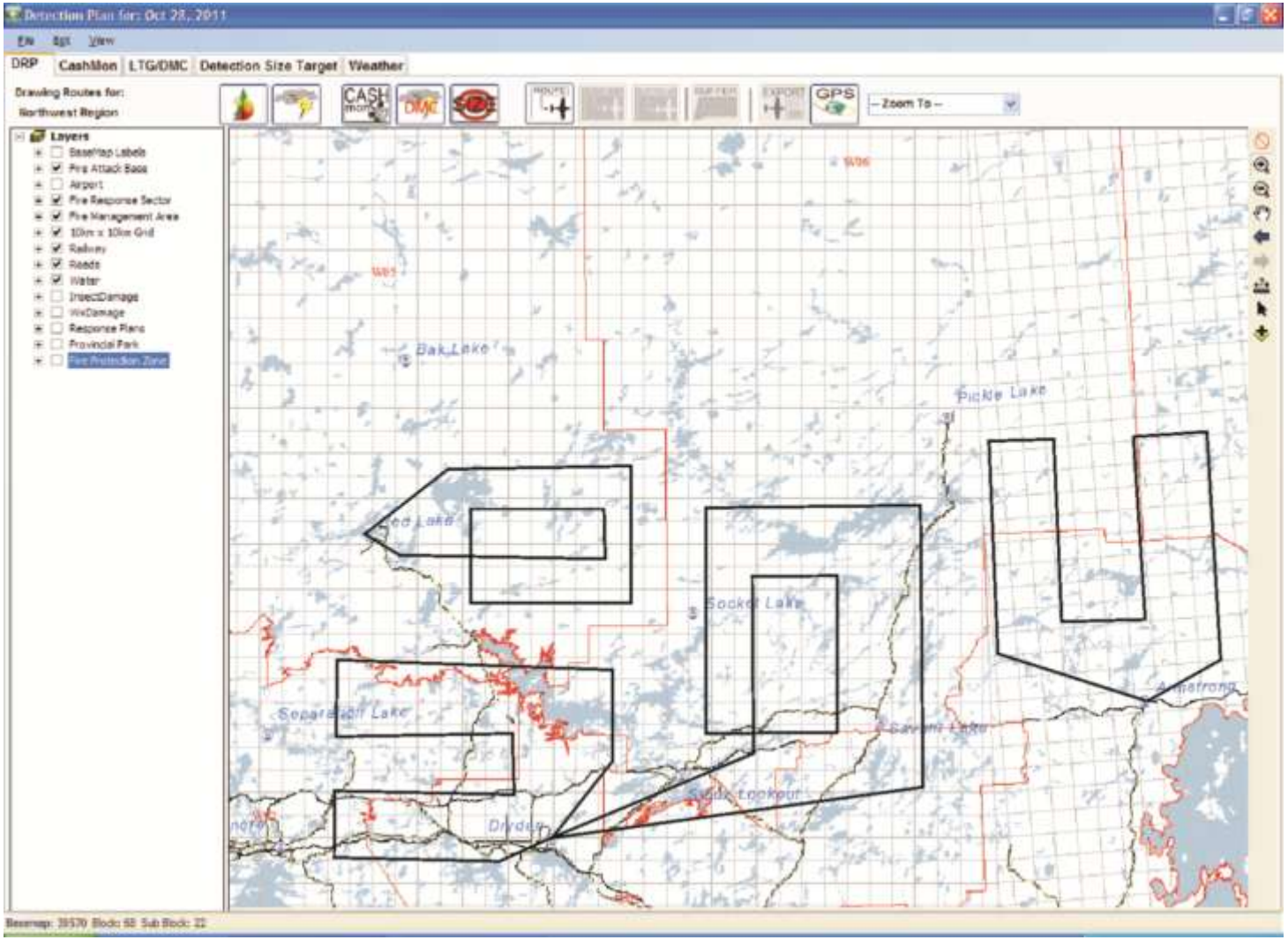
Fire behaviour

Fire ecology

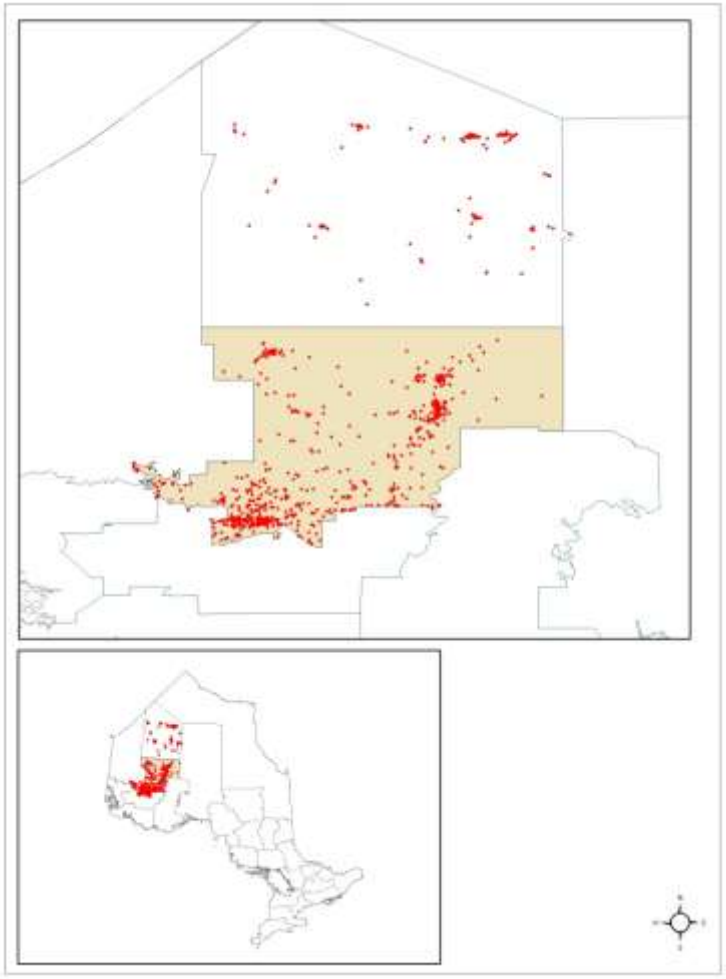
Human dimensions of wildland fire

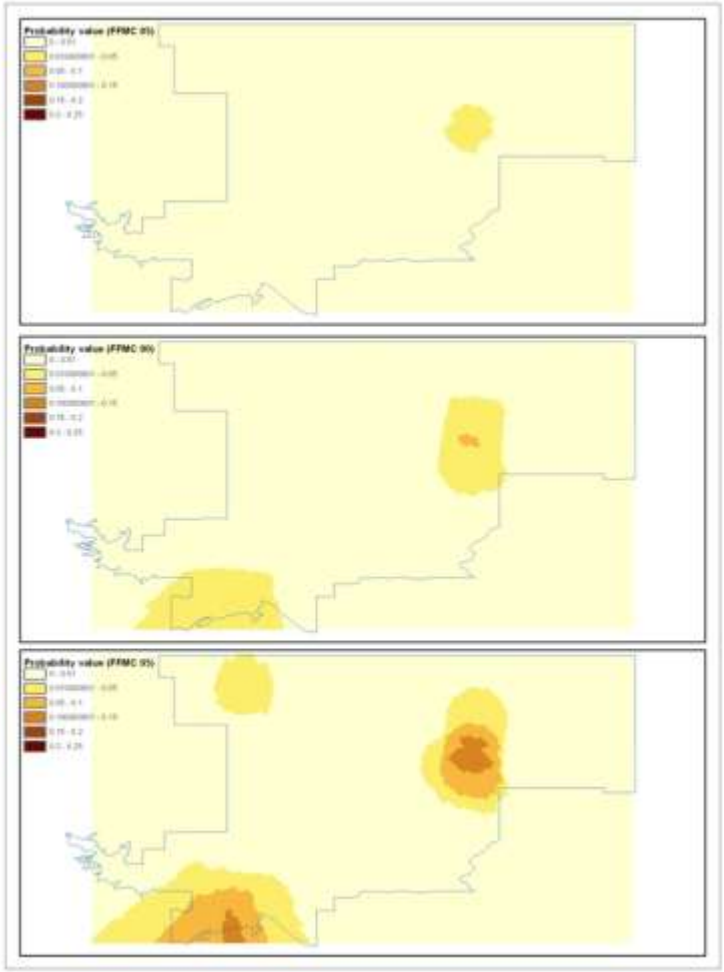
Fire management systems/analytics

Deciding when and where to fly detection patrols



Predicting fire occurrence in Sioux Lookout





Daily airtanker deployment

Design and control of spatial queues

Fires are customers

Airtankers are servers

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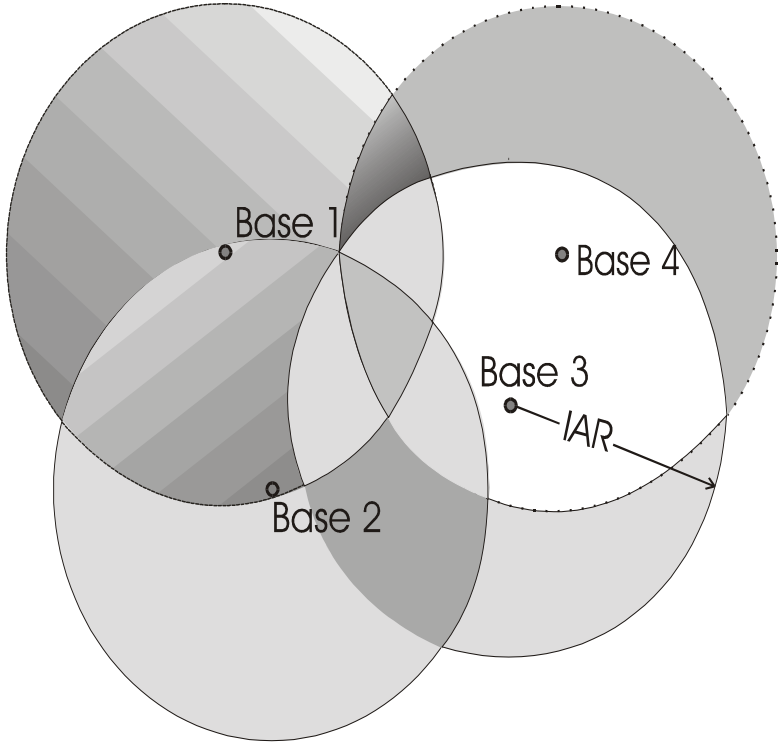
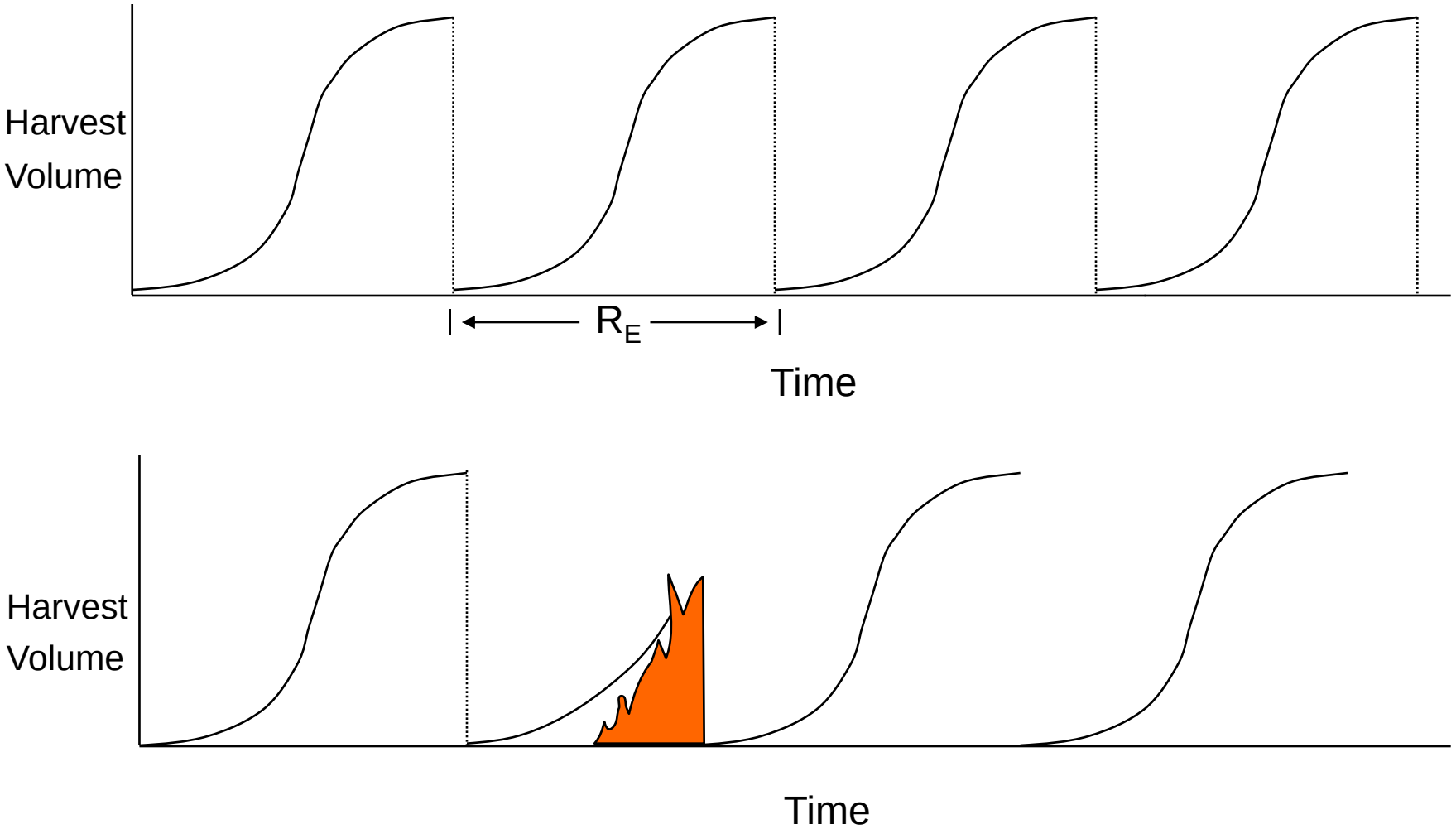
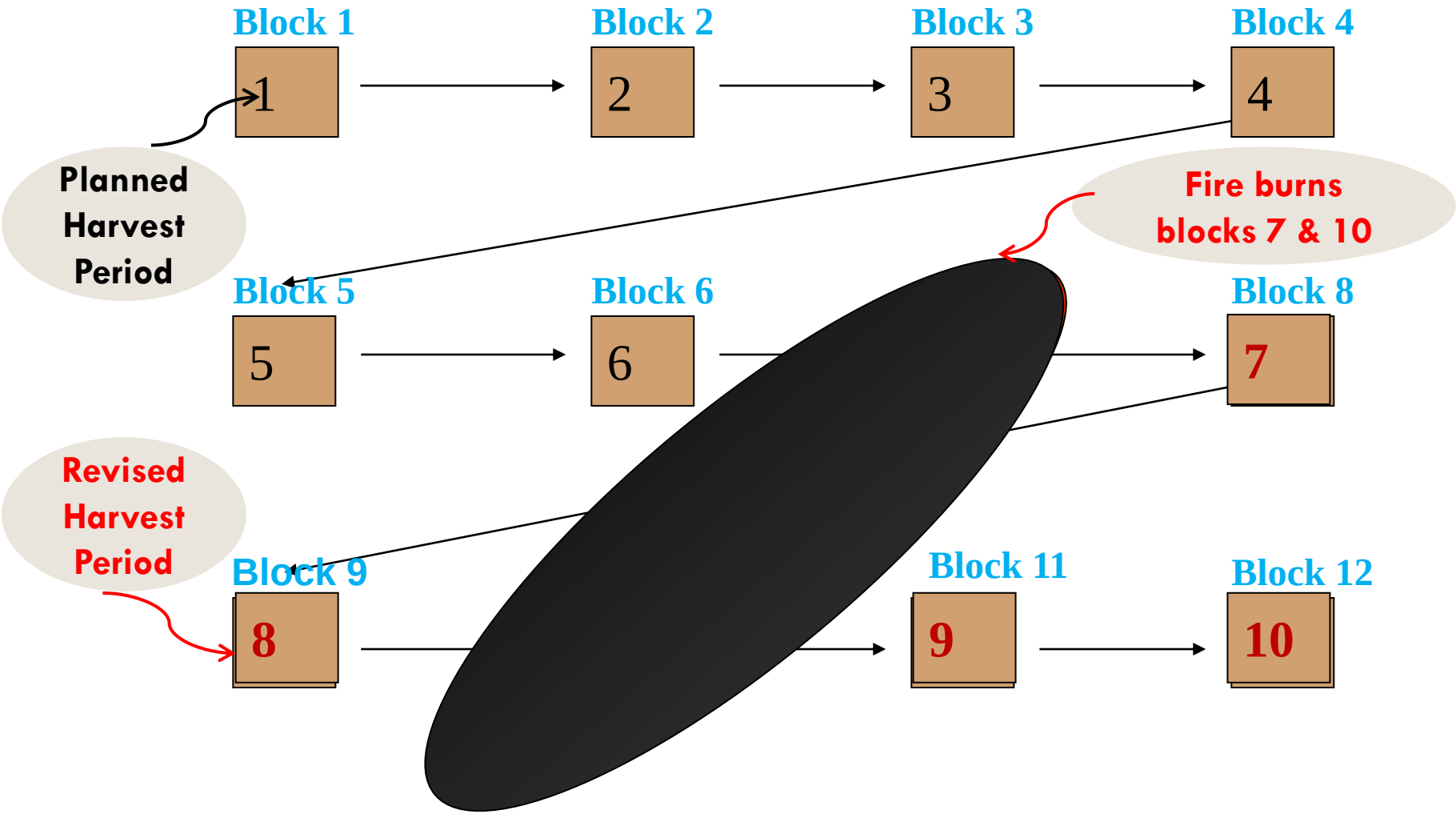


Economic impact of fire at the stand level



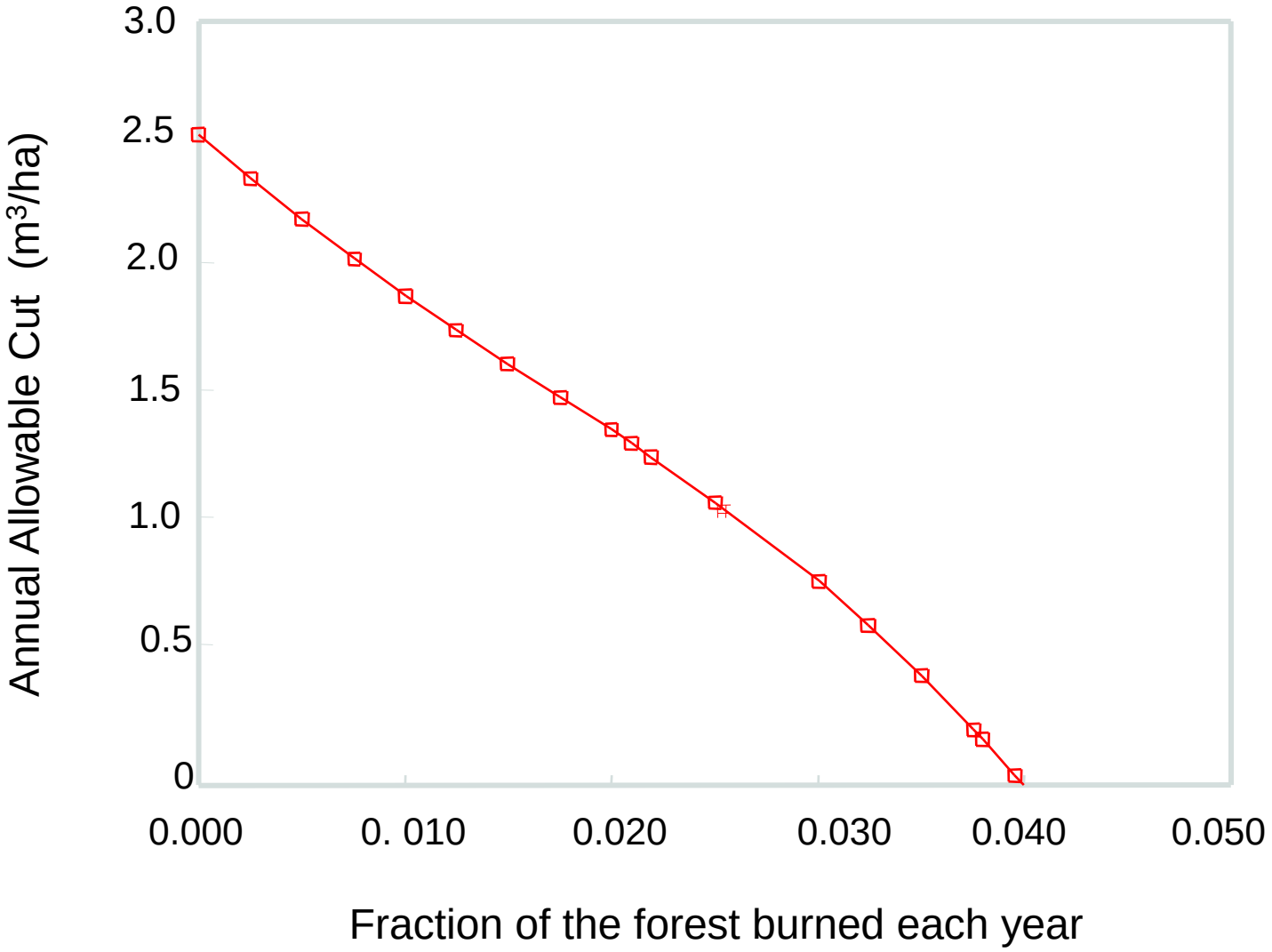
Impact of fire on timber production at the forest level



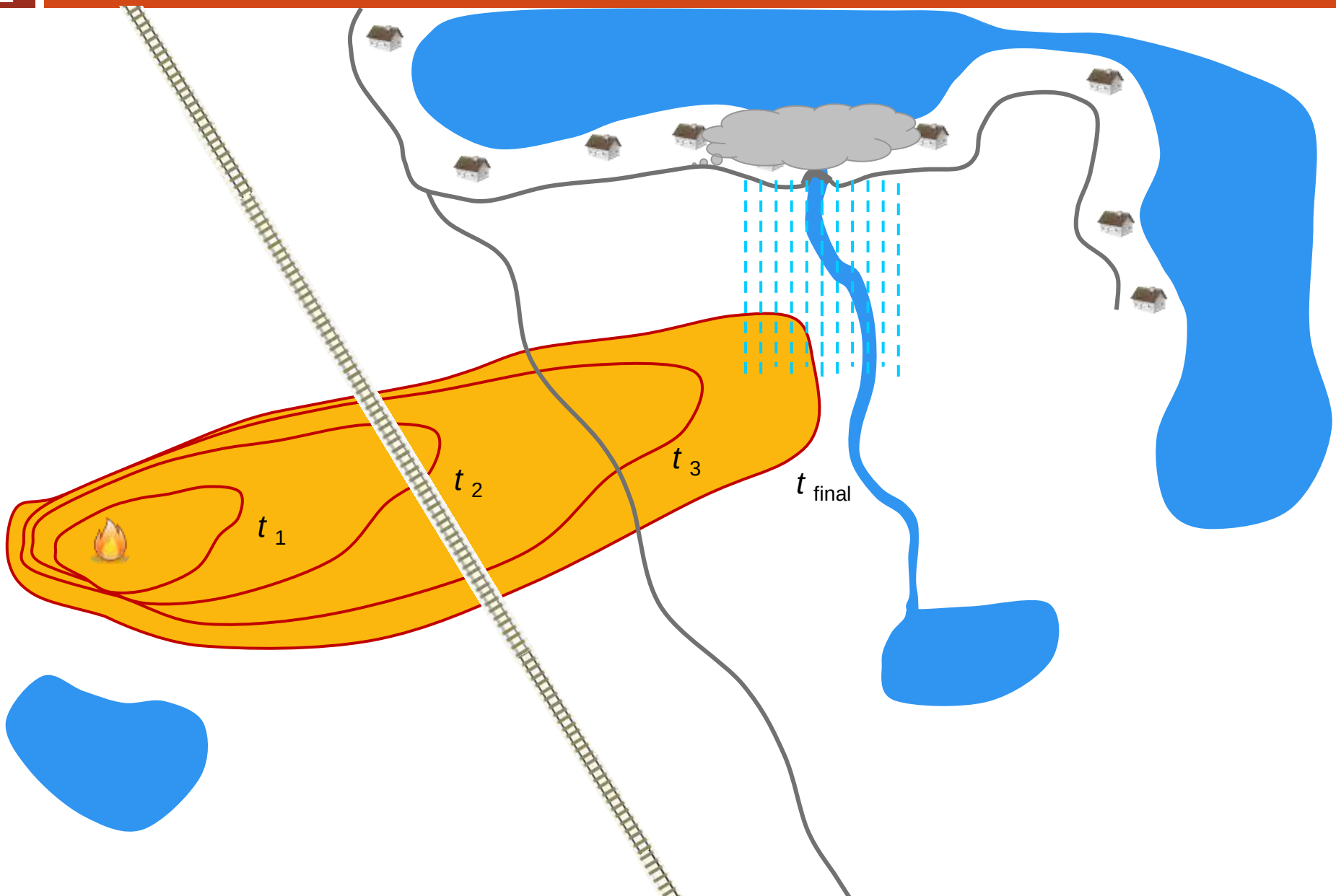
Build roads to blocks 8,9,11 and 12 earlier than planned (more expensive)

Cut blocks 8, 9, 11 and 12 earlier than planned (less volume/ha)

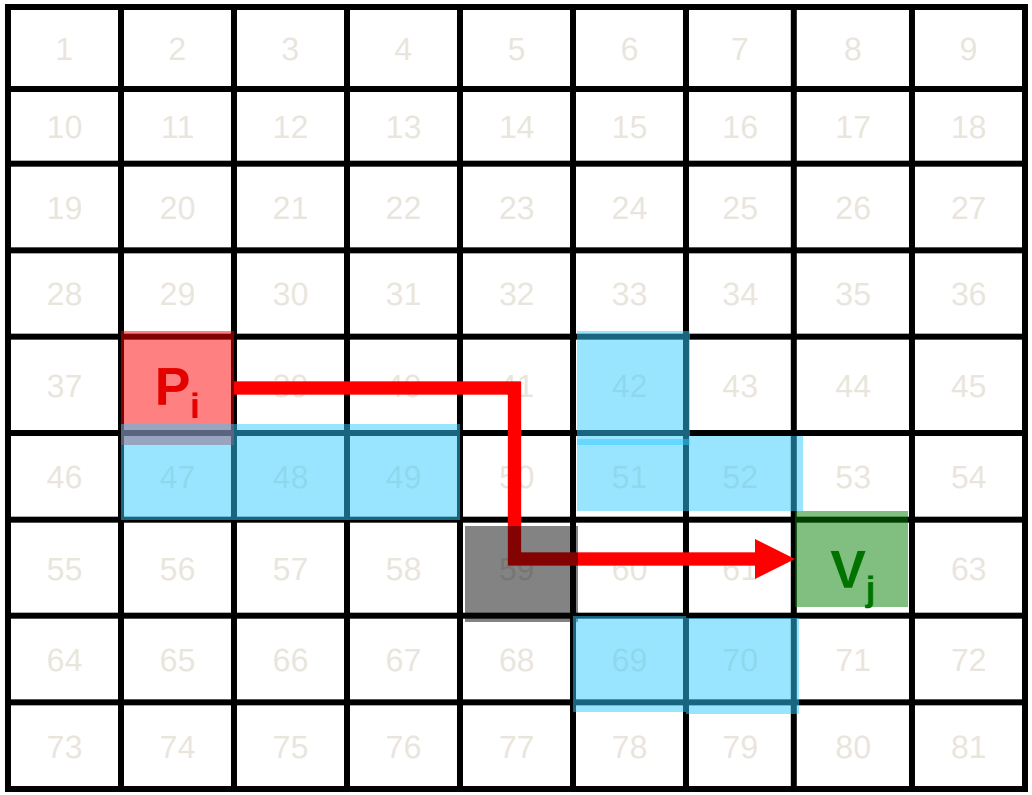
Impact of fire on AAC of a jack pine forest



Large fire management



Fuel management



P_i = probability that a fire will start in cell i

V_j = values at risk in cell j

RP(i,j) = probability a fire will spread from cell i to cell j

Cost effectiveness of fuel treatments?

Boreal forest very large, sparsely populated and covered with low value wood

Cannot afford to modify large parts of the landscape

Treat fuels **close** to communities and other values

HOW CLOSE ?

AT WHAT COST ?

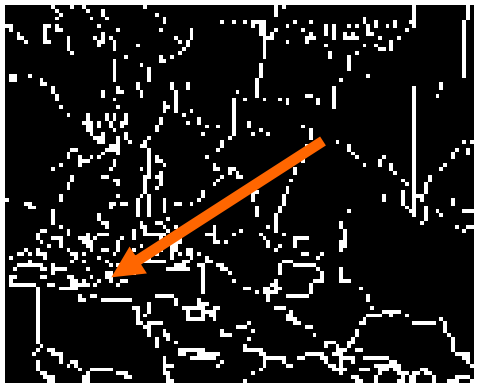
FireSmart the structures

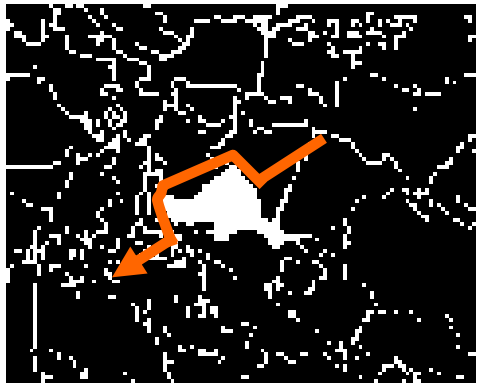
Cabin protected by sprinklers

Ontario Ministry of Natural Resources

Cooling effect of cutting a harvest block

The expected loss that cell i imposes on cell j with and without harvest block k being cut





Travel time with block k T(i,j) < T(i,j/k) without block k

Some emerging challenges

Climate change will deliver **more** fires and **more** intense and difficult to control fires

More people will build **more** homes and cottages on **more** flammable landscapes

Growing recognition and acceptance of the fact that fire is a natural ecosystem process will force fire managers to put and leave **more** fire on the landscape

Government fiscal realities will force fire managers to continue to do even **more** with **less**

Some “easy” predictions

We cannot nor should we attempt to continue to practice fire exclusion everywhere

Fire management strategies need to be revised to achieve a more appropriate balance between social, economic and ecological impacts

Fire mangers will be called upon to resolve increasingly complex risk laden decision-making problems

COMING VERY SOON
TO A FOREST NEAR YOU !

How well are we doing?

We usually respond well **- but often not until after the fact (e.g. Kelowna, Barriere, Slave Lake)**

We developed the Canadian Wildland Fire Strategy **– but we're fumbling with its implementation**

Our research capability has been degraded to a point where Steve Pyne has "called us out" when comparing us with Australia and the United States

WE'RE LIVING ON OUR PAST LAURELS !!!

What can/should the insurance community do?

Continue to support research on fire in WUI areas

Continue to speak out about the importance of fire management in Canada

Pay more attention to fire when your clients insure property in WUI areas

Want to make a real difference?

Join with fire mangers, companies that work in and near flammable landscapes, companies that manufacture and sell fire equipment, community representatives, tourist outfitters, environmental groups and others in a **collaborative effort** to build a new **Canadian** fire management partnership that will address our urgent need for to **improve the way we manage fire in Canada in the 21st century**

You still working on forest fires ?

Ignace 7 - 1976

Sioux Lookout 35 - 2011

Acknowledgements

Many former graduate students, research assistants and others

Natural Sciences and Engineering Research Council of Canada

Sustainable Forest Management Research Network

Ontario Ministry of Natural Resources