



Emerging Trends/Issues in Global Fire Management: Implications for Canada?

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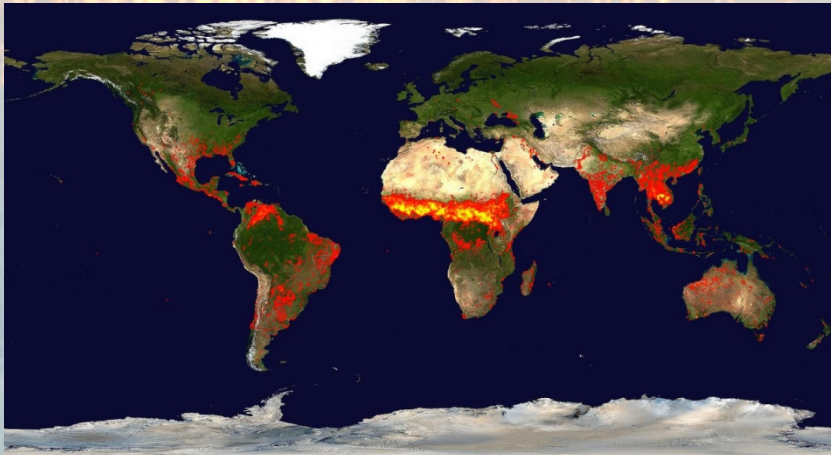
*Wildland Fire Canada 2010
Kitchener-Waterloo, Ontario*

Outline

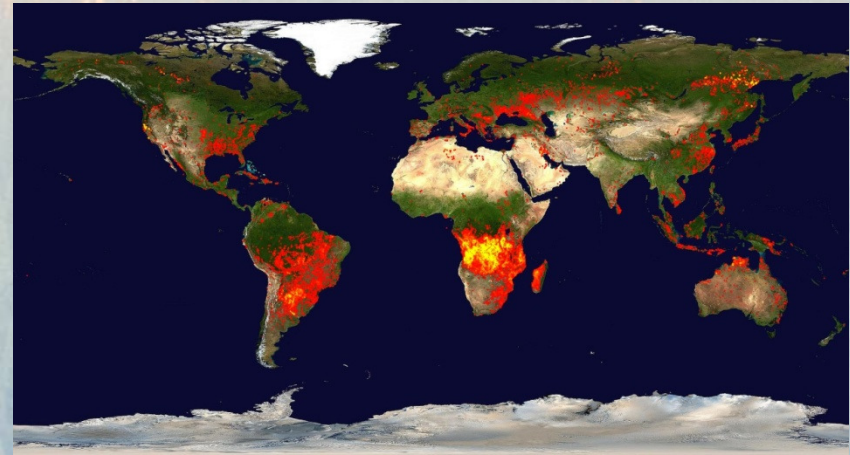
- ✦ Global vegetation fire issues
- ✦ Emerging issues:
 - Greece
 - Australia
 - Russia
 - United States
- ✦ Relevance to Canada

Global Fire Context

- ✦ Prominent disturbance regime in most biomes
- ✦ 500 million hectares annually
- ✦ Often natural & ecologically significant force (e.g. boreal)
- ✦ Unnatural in some ecosystems – vegetation damage/site degradation (e.g. tropical rain forests)
- ✦ Land management tool embedded in culture of many societies in developing world (e.g. Africa)



January 2008



July 2008

Increasing Fire Activity

- ✦ Fire application in tropical deforestation still escalating
- ✦ Rural exodus converting managed landscapes to wildlands (>fuel loads/risk, more destructive fires) – 2007 in Greece
- ✦ Urban exodus – expanding WUI into flammable landscapes – key fire management priority in USA, Australia and southern Europe
- ✦ Fire exclusion policies creating increasing fuel loads (e.g. North America, Australia, northern Eurasia) and more intense fires
- ✦ Additional anthropogenic threats – fires in contaminated regions (radioactivity, chemicals, weapons) – Russia, eastern Europe
- ✦ Climate variability and change (e.g. 2010 in Russia)



Masia Can Tardà, Castellolí (Anoia)
(Catalonia, Spain) 1950

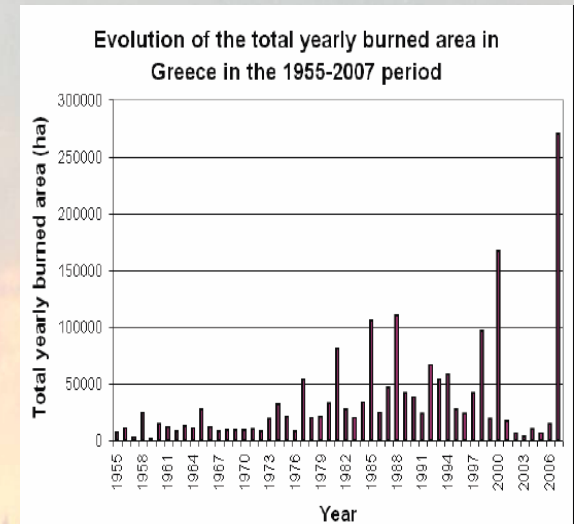


European Mediterranean Country Trends

- ✦ Rural exodus to urban centres
 - ✦ Loss of traditional land use in rural areas
 - ✦ Reduction in forest management/raw material production
 - ✦ Decline in traditional land uses (eg. grazing, firewood)
 - ✦ General increase in fuel accumulation, fire hazard
 - ✦ Increasing recreational use of rural lands
 - ✦ Continuous growth of WUI
- ✦ All of these factors, combined with a lack of public/political awareness and an ineffective (but large and expensive) fire suppression organization, exist in Greece

1 Greece

- ✦ Fires a problem (mainly southern Greece) beginning in 1970s – internal migration
- ✦ Greek Forest Service (GFS) expanded fire control capability with CL-215s and specialized ground equipment
- ✦ Fire numbers/area burned increasing through 1980s/1990s
- ✦ Political decision (1998) to transfer wildland firefighting responsibility from GFS to the urban firefighting Hellenic Fire Brigades (HFB) – GFS still responsible for prevention - no provision for cooperation.
- ✦ Massive aerial attack basic HFB approach – worked in easy fire seasons, not in difficult ones when demand exceeds aerial resources capacity and ground forces alone are inadequate (e.g. 2000 and 2007)



1 Greece 2007

- ✦ No shortage of resources within HFB:
 - 14,000 employees and seasonal firefighters
 - 14 CL-215 and 10 CL-415 waterbombers, 20 additional aircraft
 - 5 owned and 16 contracted helicopters (4 Erickson AirCranes)
 - 1500 fire trucks
- ✦ Heat waves in June and July each caused many large fires that overwhelmed resources, burning villages, killing citizens and firefighters.



1 Greece 2007

- ✦ Third heat wave in late August – extended drought, extreme fire danger conditions – devastating fires in southern Greece:
 - Initial attack ineffective – lack of coordinated ground attack support
 - International resources ineffective until weather changed
 - 184,000 ha in four days, mainly olive groves
 - Mass evacuations, little preparation of homes
- ✦ 2007 total:
 - 84 deaths, >1000 homes, 270,000 ha (forest, farms, olive groves)



MODIS – August 23, 24, 25

1 Greece 2007

- ✦ Massive funds for centralized fire control (air operations, fire trucks, personnel) – little for forest management, biomass clearing, access, fire prevention, fire behavior and fire occurrence prediction
- ✦ Demographic changes have resulted in a population with less fire knowledge:
 - Little understanding of fire prevention, fire safety and firefighting
 - Less clear perception of risk, and lack of interest in mitigating risk through Firesmart approaches



1 Greece 2007

- ✦ Mass media coverage:
 - Not proactive in alerting/preparing public early on, created sense of hopelessness and panic later – use to educate public
- ✦ No umbrella organization for strategic coordination between HFB, forestry and civil protection services
- ✦ International reviews – much uncertainty about implementation of recommendations
- ✦ Reacting to 2007 by further increasing firefighting capacity alone will guarantee further disastrous fires
- ✦ Appears fire protection is not a national government priority



2009 WUI fires in Eastern Greece

2

Australia

- ✦ Wildlands well-adapted to fire
- ✦ Frequent low-intensity prescribed fires in native vegetation prevents fuel accumulation
- ✦ Prescribed fire issues – capacity, environmentalists
- ✦ More severe fires now occurring – destroying conifer plantations
- ✦ Increasing vulnerabilities at the wildland urban interface
- ✦ Conflict between forest (land) management and fire suppression approaches
- ✦ Fire as a part of land management or centralized fire control – a mixture of both?



2

Australia

- ✦ Wildlands well-adapted to fire
- ✦ Historically used prescribed fire to increase patchiness, reduce likelihood of larger fires
- ✦ Still used extensively across Australia, but an ongoing active debate about the place of prescribed fire in the risk mitigation arsenal



2

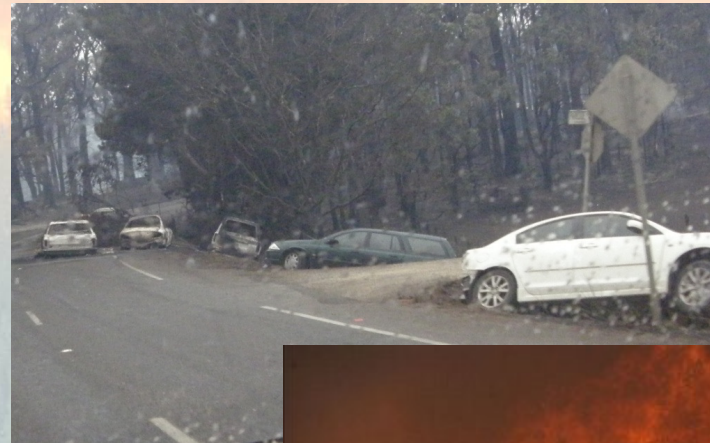
Australia

- ✦ Expansion of WUI – transfer of urban mindset to wildlands – newcomers prefer suppression model to underburning
- ✦ Suppression model growing in popularity – highly visible and shows government conviction to protection – good politics, but effectiveness in question.
- ✦ Lack of public understanding of benefits of fire maintained land leading to more reliance on centralized fire prevention and control strategies



2 Australia

- ✦ 16 Inquiries into significant bushfire events in southern Australia since 1939
- ✦ Black Saturday (February 7, 2009) latest in a pattern of serious bushfires in Victoria (1851, 1898, 1926, 1939, 1983, 2003, 2007)
 - 173 deaths, 2059 homes destroyed, 78 townships affected



2 Australia

- ✦ 2009 Victorian Bushfires RC major findings:
 - Revise bushfire safety policy to enhance role of warnings
 - More than double amount of fuel reduction burning on public lands
 - Bushfire & community shelters be established in high-risk areas
 - Coordination/communication between state fire organization and Country Fire Authority be drastically improved
 - “Stay and defend or leave early policy” be modified to recognize the need for evacuations on extreme fire days
 - Further investment in bushfire research, including a permanent national research centre



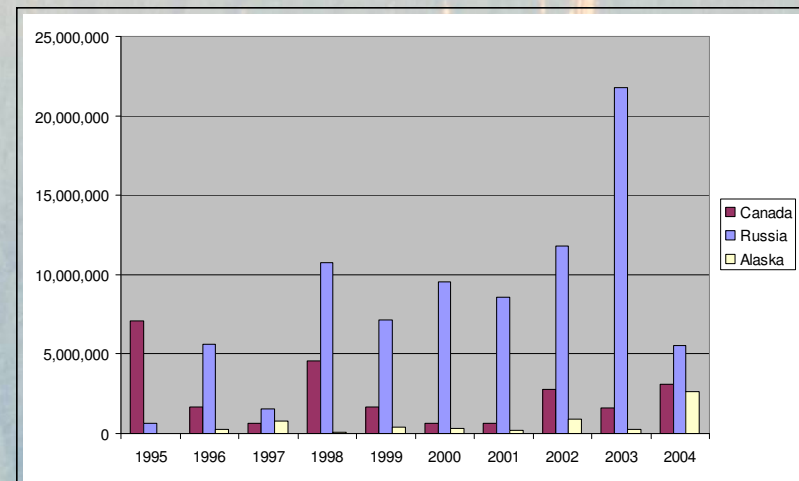
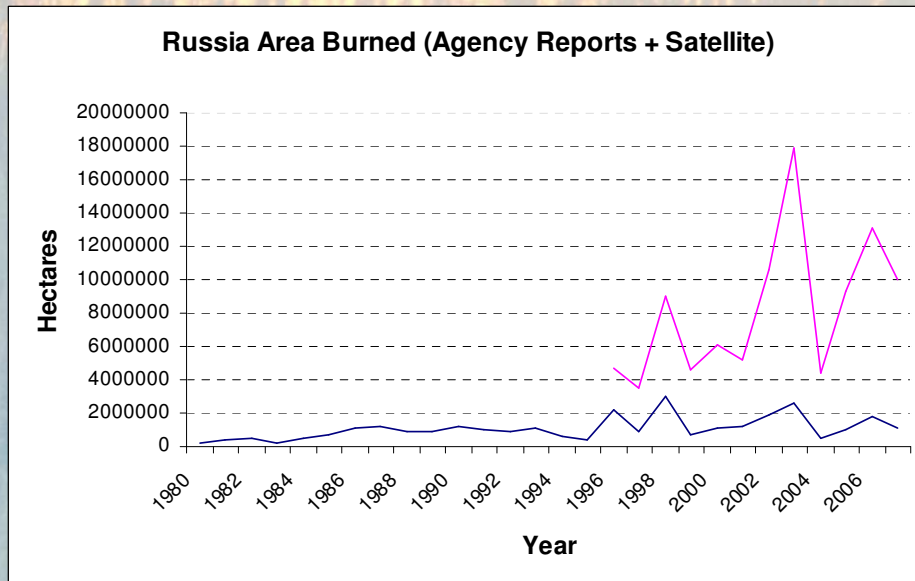
2 Australia



- ✦ Uncertain at this time whether RC recommendations will be implemented in full, leading to improved safety standards, broader public acceptance of prescribed fire etc.
- ✦ Recommendations from earlier inquiries, dating back to 1939 to ensure Victoria's communities and emergency services would be prepared, and they were not in 2009
- ✦ Rebuilding communities is politically easy thing to do, yet RC argued that some community locations will always be too risky – discourage rebuilding here and depopulate land – argument is solid – practical politics makes it unlikely
- ✦ Same with power lines – cost too high?
- ✦ Implementation to improve coordination will be easily implemented, create fire commissioner position etc.

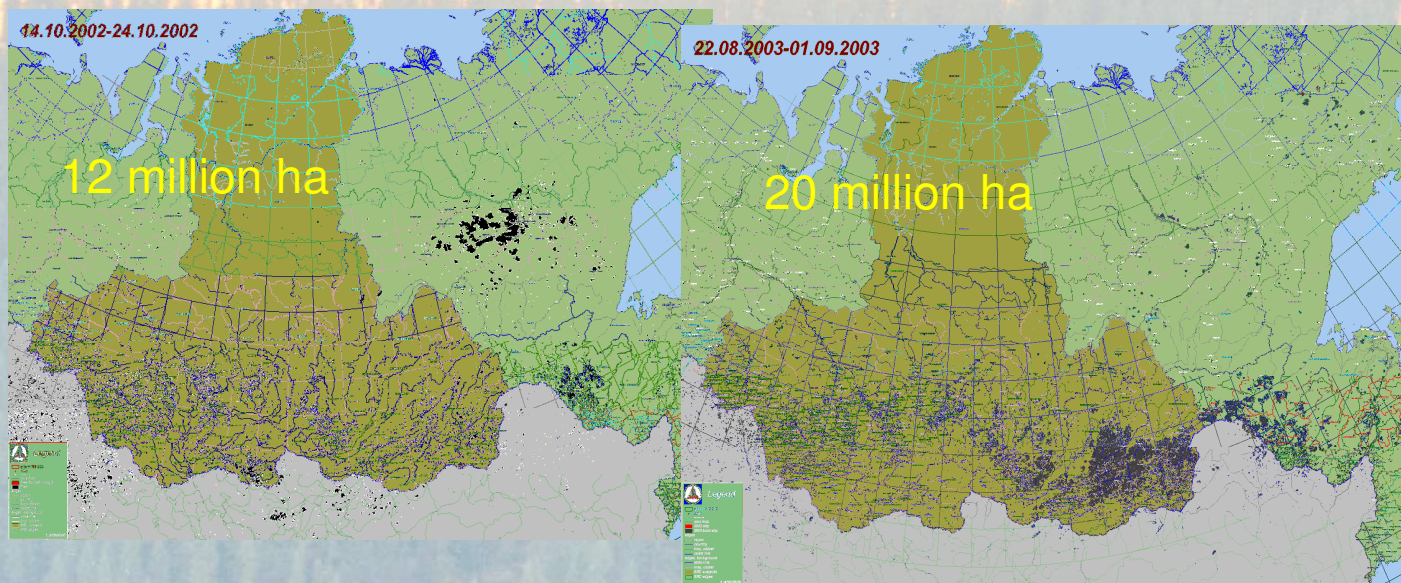
3 Russia

- ✦ 2/3 of global boreal forest
- ✦ Effective fire suppression in USSR – largest firefighting system in world (e.g. 8000 smoke jumpers, 600 aircraft in 1980s)
- ✦ Official fire records manipulated, impacts understated drastically
- ✦ 1991 collapse of Soviet Union:
 - Huge reduction in funding, area protected, detection levels, and suppression resources
 - Effectiveness minimal, > large fires and area burned



3 Russia

- ✦ Move to “capitalism” created huge disparity between few rich oligarchs and countless poor – mafia mentality
- ✦ Widespread corruption and exploitation in natural resource management – no effort at sustainability
- ✦ Illegal logging rampant, fuelling fire problems
- ✦ Forest Code change in 2007 – elimination of National Fire Service - protection mandate to regions and forest companies with no funding support – result was further neglect and indifference



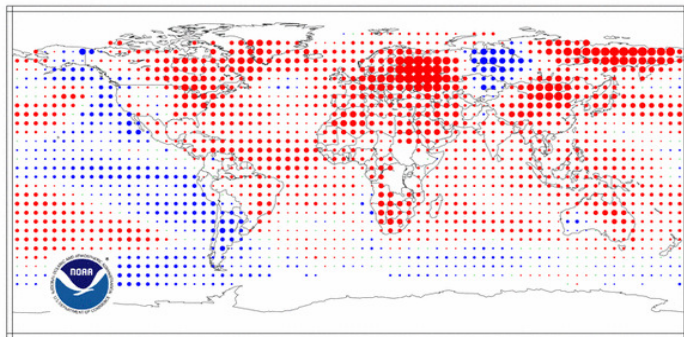
3 Western Russia 2010

- Major drought – widespread crop failures
- Heat wave began in mid-June – sustained, strong blocking ridge

Temperature Anomalies July 2010

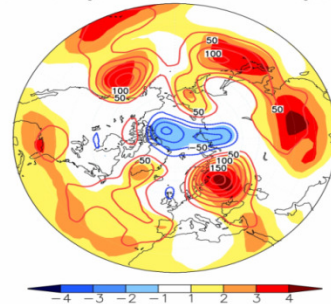
(with respect to a 1971-2000 base period)

National Climatic Data Center/NESDIS/NOAA



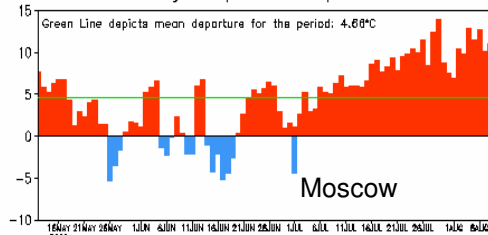
-5C -4C -3C -2C -1C 0C 1C 2C 3C 4C 5C
Degrees Celsius

500 hPa Height Anomalies 10 Jul – 09 Aug 2010



Shading: Standardized Anomalies (base period July 1979–2009)

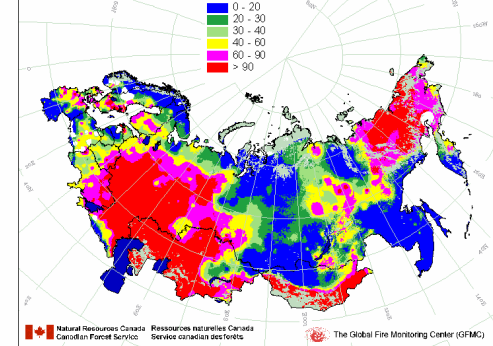
Daily Temperature Departures



2010

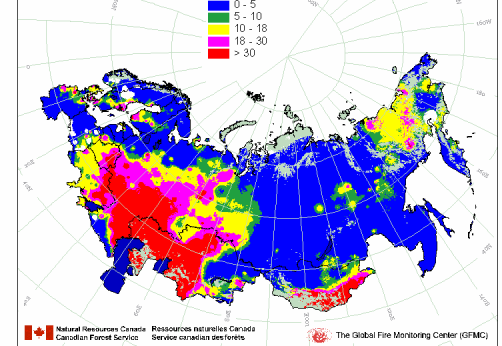
EurAsian Fire Danger System

24 Jul 2010



EurAsian Fire Danger System

24 Jul 2010



3 Western Russia 2010

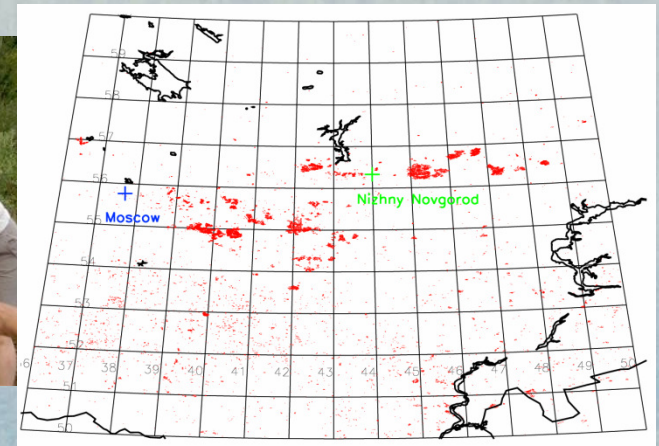


- ✦ Unprecedented heat wave June - August
- ✦ Numerous fires in western Russia (Moscow to Urals)
 - Heavily populated, cultivated region - large fires uncommon
 - Peatlands drained for energy production – not flooded after 2002 fires
 - Birch and pine forest, heavy agricultural production
 - Increasing rural abandonment in 21st century – >summer homes
- ✦ Over 1000 fires, ~200,000 hectares burned
 - Smoke pollution levels extreme over Moscow and region for extended period
 - Daily mortality in Moscow doubled from 350 to 700 (heat stress/smoke impacts)
 - Longer-term health impacts unknown but significant
 - More than 50 people killed, 5000 homeless, 15 billion USD in losses



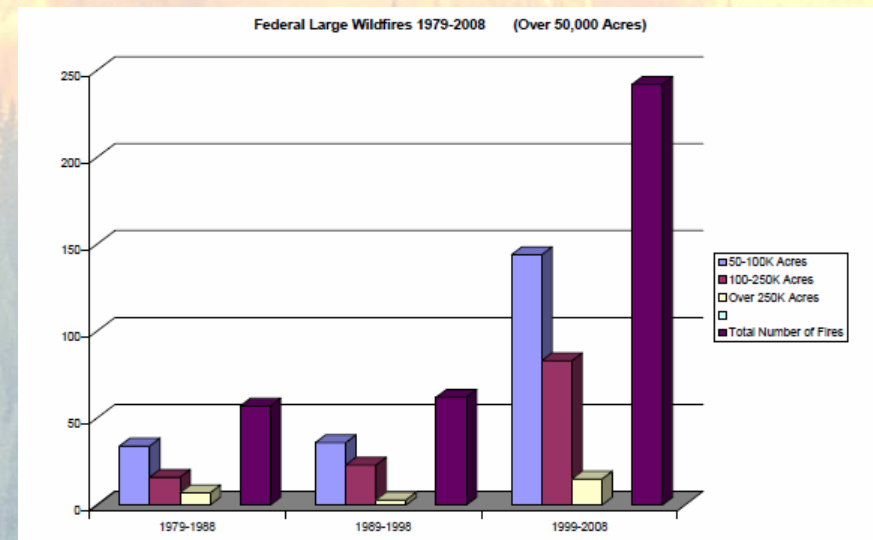
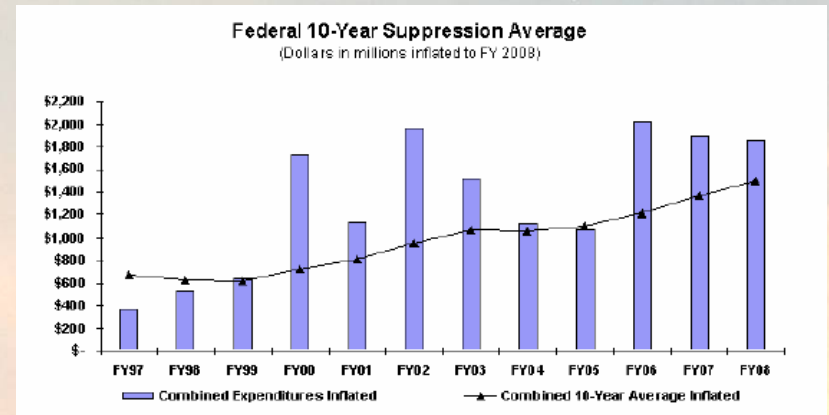
3 Western Russia 2010

- ✦ Delayed recognition/ response of government typical
- ✦ Dozens on new human-caused fires daily in this region while crisis ongoing – speaks to lack of responsibility
- ✦ Systemic problems:
 - Downsizing of fire management capability
 - Lack of commitment to sustainability
 - General malaise in country and government viewed as corrupt
- ✦ Combine systemic problems with inevitable major fire event - creates a Perfect Storm situation
- ✦ Will Russian government learn? Unlikely.

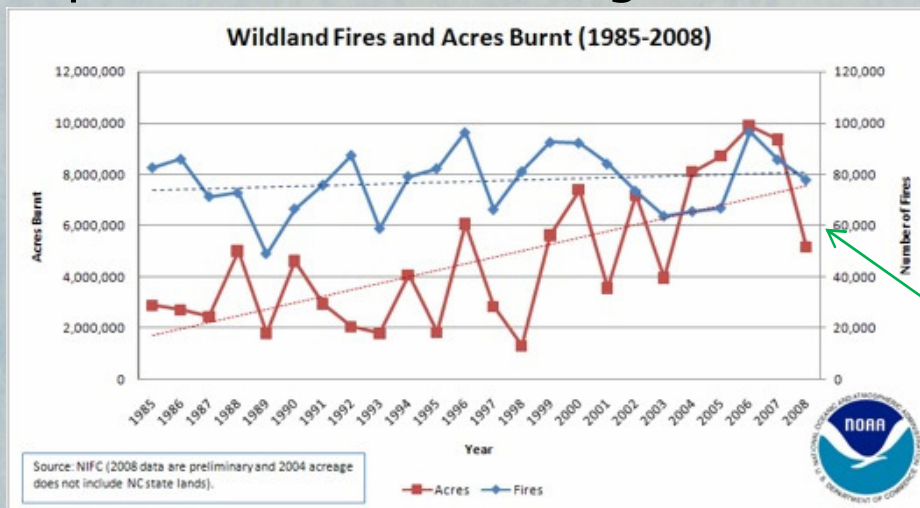


4 United States

- Focus in last decade on expanding WUI and dealing with fuel accumulation resulting from decades of fire exclusion
- Number of fires and area burned continuing to rise – larger, more intense fires common
- Fire impacts growing in significance, >public awareness
- Fire costs rising – using major portion of USFS budget



2009 numbers similar to 2008



4 Quadrennial Fire Review 2009

✦ 5 forces driving future trends:

✦ Climate change effects:

- Longer, larger, more severe fire seasons in more regions
- More large wildfires escalating in an irregular pattern: asymmetric fire

✦ Cumulative drought effects:

- Further stress fuels accumulations
- Water competition, invasive species, insect kill, faster drying of fuels

✦ Continued wildfire risk in WUI:

- Growth despite more awareness/involvement of communities
- Driven by population shifts, development of former timberlands

✦ Escalating emergency response demands:

- CC will affect frequency/devastation of other natural disasters
- Fire management will play an increasing role

✦ Strained agency budgets:

- Federal, state and local budgets affected by recession, energy costs
- Federal costs exceeded budgeted costs last 5 years

4 United States

- ✦ FLAME (Federal Land Assistance, Management, and Enhancement) Act passed late 2009 – develop a “Cohesive Wildfire Management Strategy” by late 2010
 - Departments of Agriculture, Interior and Homeland Security, along with state, local and tribal governments
 - Emphasizes suppression, fire restoration and fire-adapted communities
 - Similar to CWFS?
- ✦ Fire science budget 10 million in 1998, 60 million today
- ✦ Separating fire management from land management the growing debate – all hazard emergency services – emphasis on technology – costly but where the votes are
- ✦ Cost of suppression driving \$ and politics in interface
- ✦ Research to be done on land management issues

Summary

- ✦ Resist efforts to separate fire and land management - while exercising our emergency management skills, we must ensure that wildland fire management remains rooted in the land – must make the argument that fire management is about much more than suppression – persuasive.
- ✦ This is essentially the common issue in US, Greece and Australia
- ✦ Smoke pollution and health issues in Russia..a lesson for Canada... an opportunity to educate?
- ✦ Doing what is politically important....what the public will buy...indications in US that we underestimate public ability to grasp issues

Summary - Common Issues

- ✦ The need for improved preparedness, early warnings and evacuation planning has been stressed in all countries – could we be doing more planning in Canada?
- ✦ Drastic smoke and health issues in Russia – is this a growing problem in Canada? 2009 BC and QC fires affecting urban air quality downstream – need to better forecast and model smoke impacts.
- ✦ Will future fire management in the WUI (interface and intermix) be an extension of urban firefighting or the responsibility of land management agencies? The public has unrealistic expectations about this issue, and a comfort level with urban firefighting.
- ✦ Climate change is creating more extreme fire events in all countries, often in combination with other natural disturbances (e.g. MPB, blowdown)
- ✦ Other governments (AUS and US) recognize importance of funding expanded fire research programs to help address emerging issues – meanwhile CDN government cuts fire research programs.
- ✦ Recognition that more fire required on landscape, whether through prescribed fire or allowing fires to burn – a forest health issue and a fuels mitigation issue – requires public/policymaker education.

Finally....

- ✦ Recent fire issues in other countries should resonate with forward-looking Canadian fire managers and policymakers.....similar fire issues are or will be happening here.
- ✦ The CWFS has successfully highlighted these issues in the past...recent developments internationally serve to strengthen the urgency of taking action now.
- ✦ Thank You.