

Annual Report on Emergency Fire Expenditures

FY 2008

Purpose

The purpose of this Report is to address the requirements of Minnesota Laws of 2007, Chapter 57, Article 1, Section 4, subd. 4, which states in part:

“By November 15, each year, the commissioner of natural resources shall submit a report to the chairs of the house and senate committees and divisions having jurisdiction over environment and natural resources finance, identifying all firefighting costs incurred and reimbursements received in the prior fiscal year.”

State Funding for Emergency Firefighting

Emergency Fire Fighting - Direct Appropriation: Laws of 2007 appropriated \$7,217,000 the first year and \$7,217,000 the second year for prevention, presuppression and suppression costs of emergency firefighting, and other costs incurred under Minnesota Statutes, section 88.12. ⁽¹⁾

Emergency Fire Fighting – Open Appropriation: Laws of 2007 further state in part that “If the appropriation for either year is insufficient to cover all costs of presuppression and suppression, the amount necessary to pay for emergency firefighting expenses during the biennium is appropriated from the general fund.”)

Under the authority of the Open Appropriation during FY 2008, \$12,221,642 was expended.

Attachment 1 shows state fire fighting costs by object of expenditure.

⁽¹⁾ Actual expenditure as of September 30, 2008 is \$6,938,928. Some additional spending in both appropriations may occur as encumbrances are settled through December 1st, 2008.

Reimbursements to the General Fund

Payments and Collections : The DNR receives payments for certain fire related activities. These include payments for supplies sold to local government units (e.g. fire departments) from the Inter-agency Fire Cache (Cache Sales – authorized under M.S.§ 88.065), and collections from responsible parties for starting illegal or negligent fires, (Fire Cost Collections – authorized under M.S.§ 88.75). These receipts are deposited directly to the general fund and are not used by the DNR.

In FY 2008, receipts came from the following sources:

- Cache Sales - \$ 175,834
 - Fire Cost Collections- \$ 113,636
- Deposited to the
General Fund - \$ 289,470**

Special Revenue Fund: This is not a use of the state emergency fire appropriations, direct or open, but is included here due to perennial interest on this topic. The DNR provides firefighters and the CL-215 airtankers to assist federal partners in-state, send resources out of state to mobilize on national wildfire emergencies, or assist Compact partners. These costs are initially charged to the Emergency Fire Special Revenue Fund. **During FY 2008 the DNR expended \$2,422,486 in reimbursable costs for national mobilizations and Compact support.** Approximately \$1.8mm is due to firefighter mobilizations and \$0.6 mm is due to CL-215 mobilizations. The federal government reimburses federal costs and Compact partners (adjoining states and provinces) reimburse their costs.

The Special Revenue Fund may over-recover costs reimbursed from out-of-state deployments, mostly from use of the CL-215 airtankers, but also from other equipment such as wildland engines. This is because the state adds a portion of the fixed costs associated with this equipment, which have already been paid out of the emergency firefighting appropriation. This excess recovery is periodically transferred to the General Fund. **Approximately \$595,000 will be transferred to the general fund from FY 2008 excess reimbursements.**

Suppression and Presuppression

The success of the DNR's fire suppression strategy is largely due to aggressive initial attack. The goal is to keep fires small. Once a fire escapes initial attack, costs and damages increase exponentially.

The following discussion is offered to explain how preparedness and suppression activities work together to reduce wildfire damages. Presuppression levels move on a continuum that is proportional to fire danger. Presuppression costs include activities undertaken in advance of fire occurrence to ensure more effective suppression. These activities include overall planning, recruitment and training of personnel, procurement of firefighting equipment and contracts, and maintenance of equipment and supplies. Suppression costs include activities that directly support and enable the DNR to suppress wildfires during times when fires are likely to occur, including the pre-positioning of resources. As fire danger and fire occurrence increase, the resources that must be positioned for immediate response also increase. **Presuppression costs amounted to 21% of the direct and open fire appropriations in FY 2008. Historically, presuppression has composed 25% or less of the fire account.**

The DNR uses a cost coding system to provide accountability for emergency fire account expenditures. This detailed system captures all fire account expenditures and enables managers to identify costs charged to individual fires. Local supervisors are held accountable for expenditures in their areas.

Attachment 2 shows the percentages of fire expenditures allocated to prevention, presuppression and

suppression activities.

Planning

Base costs for wildfire response are affected by general weather and precipitation patterns, in addition to actual fire occurrence. A system for determining potential wildfire risks and establishing fire planning levels is used to guide the level of readiness week to week.

Attachment 3 shows the criteria and planning levels currently in use.

These planning level guidelines are reviewed and implemented at weekly conference calls with fire managers from all of the agencies that cooperate in Minnesota wildfire suppression efforts. Planning levels are set for each region of the state, and for the state as a whole. The planning level, combined with daily fire danger indices, establish the preparedness level needed to effectively respond to wildfires. Historically, about 80% of wildfires in the state occur during planning level 3. Major fires also can and do occur at this level.

In FY 2008 there were 266 days of possible wildfire danger. (i.e. at least one region at planning level 2 or higher). Of the possible wildfire days, 91 were at Planning Level 2, 85 were at Planning Level 3, 90 were at Planning Level 4 and 0 were at Planning Level 5. On 38 days, at least one area was at Planning Level 3 while the rest of the state was at Planning Level 2. Persistent drought conditions resulted in double the number of high planning level days (Level 4) as occurred last year. Even though actual fire occurrence was lower, fire danger was higher for much of the year.

Attachment 4 shows the ten-year fire expenditure history.

FY 2008 Fire Season

General Activity: In FY 2008, 967 fires occurred burning 26,086 acres. Historically, the state experienced a 20-year average of about 1490 fires burning about 36,290 acres.

# Fires By Cause				
	FY 2008	%	20 Yr. Ave.	%
Lightning	43	4.5	24	2
Campfires	45	4.5	47	3
Smoking	20	2	45	3
Debris Burning	290	30	574	39
Incendiary/Arson	253	26	450	30
Equipment Use	110	11	126	8
Railroad	36	4	70	5
Misc./Unknown	170	18	154	10
Total	967		1490	

Overall, FY 2008 turned out to have higher than average percentages of, lightning, campfire and equipment causes, consistent with dry summer conditions.

Attachments 5a and 5b graphically illustrate fire history and causes.

Discussion of Fire Behavior and Fire Danger Levels

Discussion of Climatology, Fire Behavior and Fire Danger Levels

Dry conditions were entrenched across much of Minnesota during May, June, and July of 2007. The lack of precipitation during the summer months, when rainfall is typically highest and vegetation is actively growing, resulted in a rapid intensification of drought. By July of 2007, croplands were deteriorating in many areas of the State, stream flows were reaching critically low levels and fire danger was significantly increasing.

Fire danger indices reached new highs at many locations in northern and central Minnesota during July and August, keeping firefighters at a heightened state of readiness. DNR firefighters responded to 290 fires during July and August of 2007, more than double the July-August average of the previous twenty years. DNR fire reports recorded 878 acres burned during the period compared to a twenty-year average of 490 acres.

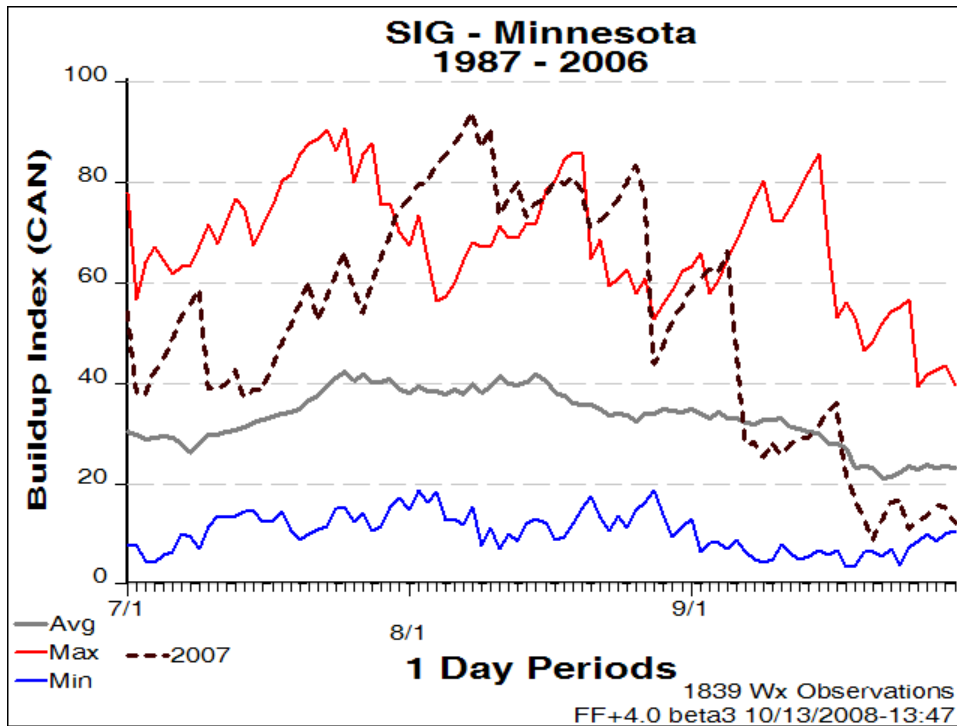


Figure 1: July-September Buildup Index (Average of stations over Northern and Central Minnesota)

Figure 1 compares the Canadian Buildup Index (BUI) from July through September 2007 with the previous 20-year average. The BUI is a relative measure of fuel dryness and availability for combustion. The BUI surpassed record levels by late July and did not decline until late August/early September 2007.

Dry conditions ended abruptly in southern Minnesota when a series of thunderstorms passed through between August 18th and 20th, dropping 4 to 15 inches of rain over a broad area. Flash flooding resulted in major damage to many communities. The National Weather Service observation site 1 mile south of Hokah recorded a monthly total of 23.86 inches of precipitation in August 2007, breaking the old August record of 16.52 inches in Alexandria in August 1900. The other record to fall was the most precipitation ever recorded in a month in Minnesota. The old record was July 1987 at the Twin Cities International Airport with 17.90 inches.

Drought relief came to northeastern MN on September 6 when rainfall totals topping six inches were reported in central St. Louis County and portions of Lake County. Moist conditions continued through the fall months, limiting fire occurrence and large fire growth. Northwest Minnesota did not benefit from the autumn rains to the same extent as the rest of the State. Five fires in Kittson and Roseau Counties in the Warroad Forestry Area burned over 7500 acres in mid-November before snowfall ended the season. These fires exhibited very fast rates of growth, burning through dormant, cured fuels but holdover in peat soil did not present a major problem.

Due to a cold and snowy April, spring fire season got off to a late start in 2008. Cool and moist

conditions continued through June. Only 698 fires were reported through the month of June, almost one-half of the 20-year average for the spring months. Acreage burned was also dramatically lower with less than 17,000 acres burned compared to a twenty-year average of over 38,000 acres for the spring season.

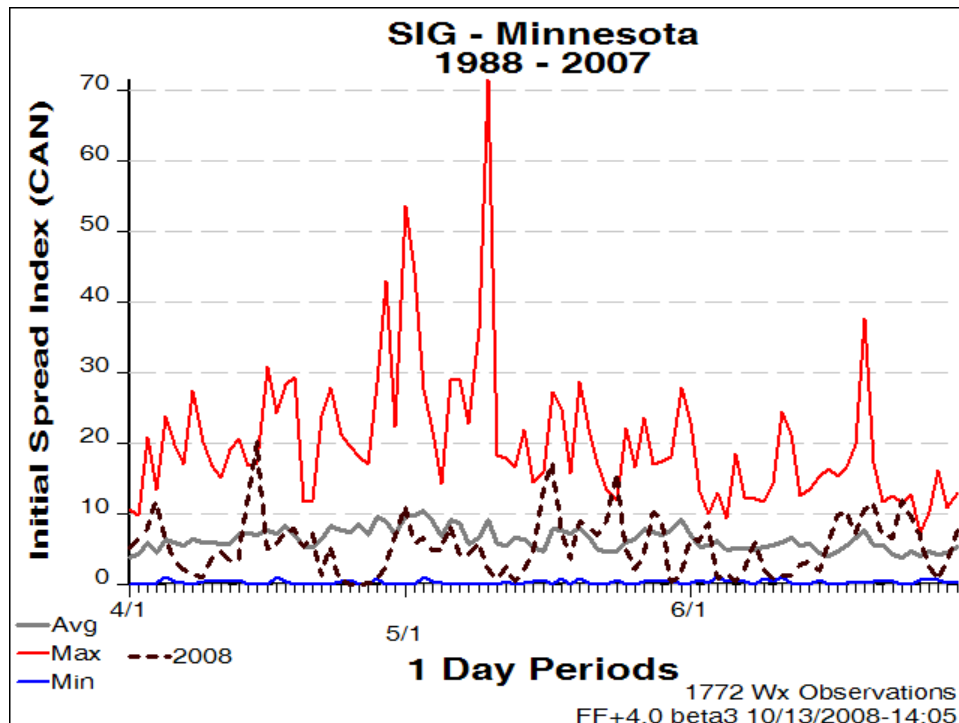


Figure 2: April – June Initial Spread Index (Average of stations over northern and central Minnesota)

Figure 2 compares the Canadian Initial Spread Index (ISI) over the spring of 2008 with the previous 20-year average. The ISI is a relative measure of fine-fuel dryness combined with wind speed. It is a good indicator of the potential rate of spread of wildland fires, which is an important consideration in assessing potential for large fire growth for springtime grass fires. ISI can vary considerably day to day, but most days during the spring 2008 were lower than average.

Major Fire Incidents in FY 2008

Although conditions for wildfires remained high through July and August of 2007, wildfire occurrence was quite low. The fall rains in September of 2007 kept wildfire conditions at a low ebb. The far NW portions of the state did experience a short period of high fire danger in early November and a few larger fires did occur. These fires were kept in check with local and regional resources for the most part. Some firefighting resources were pre-positioned from other areas of the state to aid in this effort.

As stated above, the cool, wet spring led to a sharp decrease in wildfire numbers during our normal active spring wildfire season. Fire numbers were about one half of the average for this time of year. Conditions remained cool and wet through most of the month of June.

CL - 215 Water Scooping Airtankers

The DNR purchased two Canadair CL-215 water scooping aircraft in FY 2001. The cost for both aircraft was \$6,390,000. The purchase was financed by borrowing at the direction of the Department of Finance. This debt was retired in December 2005

Two state-owned CL-215 water scooping air tankers are each capable of dropping 1,400 gallons of water per pass over a wildland fire. Scoopable water is abundant in the lakes of northern Minnesota; aircraft turnaround times between a water source and the wildfire can be as short as three minutes, enabling each aircraft to deliver up to 28,000 gallons of water every hour.

In FY 2008 these aircraft made 814 water drops, delivering 1,139,600 gallons of water on 47 wildfires in Minnesota. During times of low fire danger the tankers may be temporarily sent to other states under cooperative contracts. In FY 2008, the aircraft relocated outside of Minnesota to California due to extreme fire conditions in the Southern California.. In addition to working on state fires, the air tankers are dispatched under cooperative agreements to MNICS partners such as the U.S. Forest Service, B.I.A., U.S. Fish and Wildlife Service, National Park Service and on day flights to neighboring states and provinces such as Wisconsin, Michigan and Ontario.

Attachment 6 summarizes the ownership costs for the CL-215's

Land-based airtankers continue to be used in-state, with large retardant aircraft and single engine airtankers (SEATs) supplementing Minnesota's CL-215 fleet. [In the spring of 2008, the DNR utilized a "Fire Boss" water-scooping SEAT, one land-based SEAT. Additionally, MNICS partners utilized state air tanker bases when they brought in one private contracted CL-215.

Attachment 7 illustrates where CL-215's fought fire in FY 2008.

Attachments

Attachment 1 – State Fire Expenditures by Object Category for Emergency Fire Appropriations

Attachment 2 – Percentage of State Fire Costs in Prevention, Presuppression and Suppression

Attachment 3 - Guideline for Statewide Planning Level Determination

Attachment 4 - Ten Year Expenditure History of State Fire Fighting Costs.

Attachments 5a and 5b – Graphical Representation of Wildfire History and Causes.

Attachment 6 - Summary of Costs for CL-215 Air Tankers

Attachment 7 – CL-215 Dispatches in FY 2008

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Attachment 1

**Emergency Fire Direct and Open Appropriations
State Expenditures by Category
FY 2008**

Direct Appropriation	6,938,928
Open Appropriation	12,221,642
Total	19,160,570
Salary Costs	9,509,484
Operating Costs	9,651,086
Total	<u>19,160,570</u> *

* Actual expenditure as of September 30, 2008. Final numbers will change slightly as encumbrances are settled through December 1, 2008.

FY 2008 State Fire Cost Summary

By Type of Activity and Appropriation

	Emergency Firefighting Direct	Emergency Firefighting Open	Total		
Fire Prevention	0.5%	0%	0%		
Fire Presuppression	16%	24%	21%		
Fire Suppression	83.5%	76%	79%		
Total			100%		

	PLANNING LEVEL I	PLANNING LEVEL II	PLANNING LEVEL III	PLANNING LEVEL IV	PLANNING LEVEL V
BI (Q) spring , pre-green, floating 5 day average	Not applicable	0-45	46-70	71-95	96+
BUI (after June 1, floating 5 day average)	Not applicable	0-25	26-50	51-67	68+
ERC (Q) (alternate summer/fall indicator, after June 1, floating 5 day average)	Not applicable	0-15	16-29	30-36	37+
8-14 day Weather Forecast	Winter conditions, most of State snow covered, temps below freezing.	Normal conditions for season, adequate precip. expected	Less than normal precip. and RH, higher than normal temps forecast	Dry weather patterns persisting, no change forecast	Dry pattern intensifying. Unstable weather forecast leading to extreme fire behavior conditions.
MN Regional Planning Levels	All Regions/Agencies at P.L. I	One or more Regions/Agencies at P.L. II	Two or more Regions/Agencies at P.L. III	Two or more Regions/Agencies at P.L. IV	Two or more Regions/Agencies at P.L. V
Eastern Area Planning Level	I	I-II	I-III	I-IV	I-IV
National Planning Level	I-II	I-III	I-IV	I-V	I-V
Fire Occurrence (Initial Attack)	Rare, infrequent fire occurrence	Fires reported in scattered Areas. Generally less than 10 fires/day Statewide.	Multiple Areas/Agencies reporting fires. 10 to 20 fires/day Statewide	Multiple Areas/Agencies reporting fires. 20 to 30 fires/day Statewide	Multiple Areas/Agencies reporting fires. 30+ fires/day Statewide.
Fire Occurrence (Escaped fires)	None	None	1-2 fires requiring extended attack Statewide (more than mop-up)	3-5 fires requiring extended attack Statewide	5+ fires requiring extended attack Statewide
Sociopolitical Considerations	Statewide or Regional events such as fishing opener or the Fourth of July; natural events such as floods or windstorms; other unexpected or unusual events that may have large scale impacts should be considered.				
Resource Availability	Normal complement of personnel.	No shortages expected.	Moderate demand for some in-state resource types expected	Shortage of certain in-state resource types	Most in-state resources committed. Out of State assistance necessary.
In-State Mobilization	None	Less than 5% of statewide resources assigned out of home unit.	Some short term movement occurring, 5-10% of statewide resources assigned out of home unit.	10-20% of statewide resources assigned out of home unit.	20%+ of statewide resources assigned out of home unit.
Out of State Mobilization	If out of State mobilization is occurring or anticipated to occur, an 'A' designator will be applied at the current Planning Level.				

- Once Planning Level has reached level III in spring, preparedness will not drop below P.L. III until May 31 or later.
- Terms used above, which are calculated daily from weather and fuel measurements:
 - BI (Q) = **Burning Index**, fuel model Q: A measure of fire danger based on the probability of ignition and fire spread in a specified forest type.
 - BUI = **Build Up Index**: An indication of the dryness of larger sized woody fuels, which becomes a significant factor during a drought.
 - ERC (Q) = **Energy Release Component**, fuel model Q: A measure of the expected heat release from a fire, which will be experienced by firefighters on the fireline.

09/30/2008

Attachment 4

Nominal Dollars												10 Year
By Source of Funds	FY 1999	FY 2000(b)	FY 2001(c)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008		Average
Forestry General	\$2,559,669	\$2,658,615	\$2,640,289	\$2,748,183	\$2,884,809	\$0 (e)	\$0	\$0	\$0	\$0		\$1,349,157 (f)
Emergency Fire-Direct	\$3,522,870	\$2,822,957	\$4,412,245	\$5,998,430	\$5,983,070	\$7,650,000	\$7,136,680	\$7,084,432	\$7,319,596	\$6,938,928		\$5,886,921
Cost Recovery (a)	\$486,253	\$777,690	\$952,255	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		\$221,620
Emergency Fire-Open	\$2,945,915	\$7,768,174	\$9,435,941	\$8,870,452	\$9,084,514	\$9,560,026	\$6,934,419	\$8,424,271	\$16,518,294	\$12,221,642		\$9,176,365
Fire Program Total	\$9,514,707	\$14,027,436	\$17,440,730	\$17,617,065	\$17,952,393	\$17,210,026	\$14,071,099	\$15,508,703	\$23,837,890	\$19,160,570		\$16,634,062
Cost Recovery (a)	\$486,253	\$777,690	\$952,255	\$391,698 (d)	\$448,568	\$634,163	\$955,343	\$976,131	\$277,226	\$884,278		\$678,360
Net Cost to State	\$9,028,454	\$13,249,746	\$16,488,475	\$17,225,367	\$17,503,825	\$16,575,863	\$13,115,756	\$14,532,572	\$23,560,664	\$18,276,292		\$15,955,701
Reimbursable Mobilization Fire Costs (g)	\$299,106	\$1,028,550	\$2,604,290	\$2,876,747	\$2,962,300	\$4,440,968	\$3,384,226	\$3,997,899	\$4,317,572	\$2,442,486		\$2,835,414

(a) Fire Cache Sales, Fire Cost Collections, excess recovery from Special Revenue Fund transferred to General Fund. Beginning in FY 02, Cost Recoveries were deposited to the general fund and not retained by the DNR.

(b) \$1.9mm NE MN preparedness initiative (Blowdown)

(c) Purchase of CL-215's

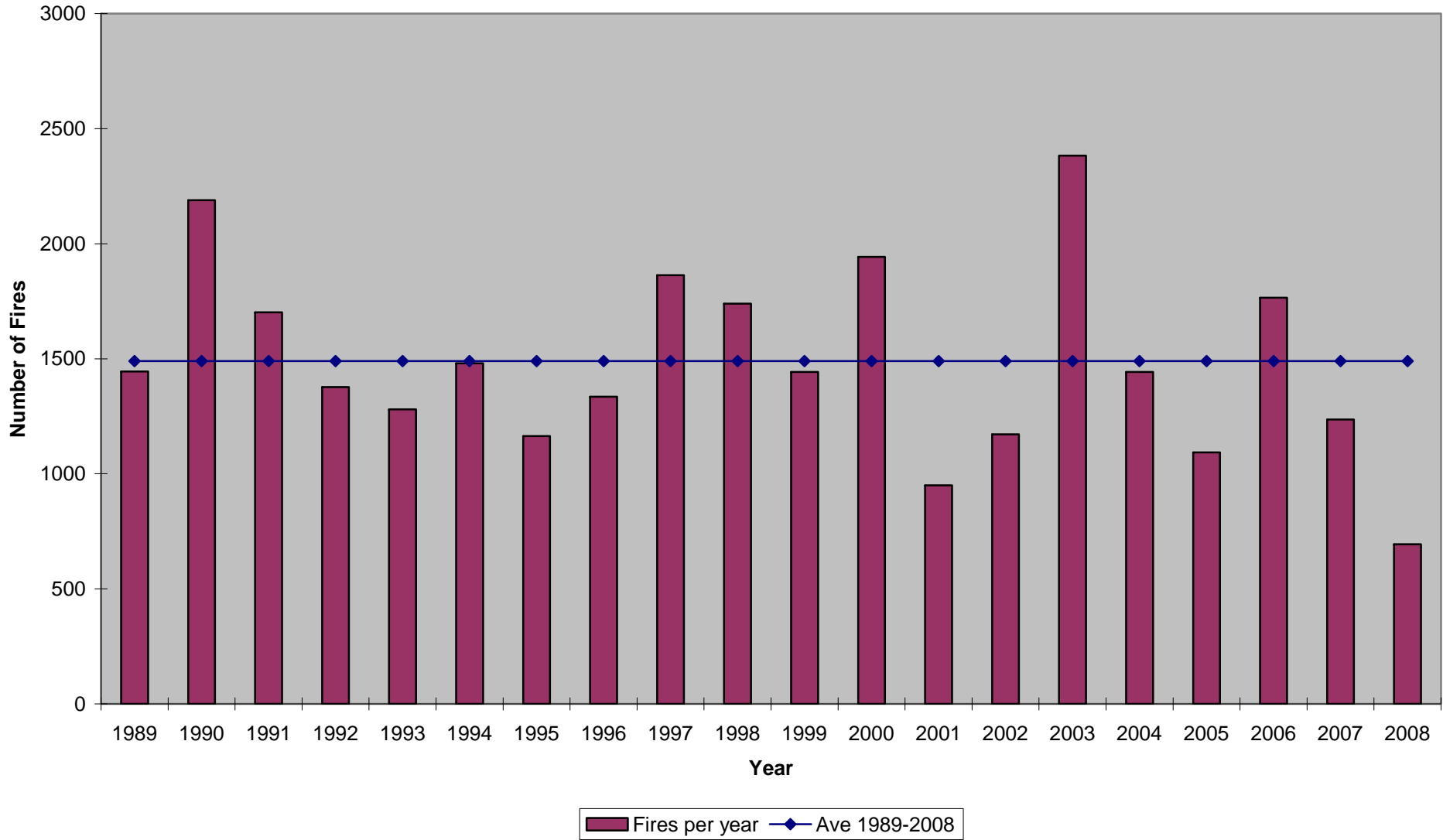
(d) Does not include a one-time Fed Disaster (FEMA) payment of \$1.7mm for the Carlos Edge Fire of 1999

(e) Beginning in FY 2004, all firefighting costs are paid by the emergency fire appropriations.

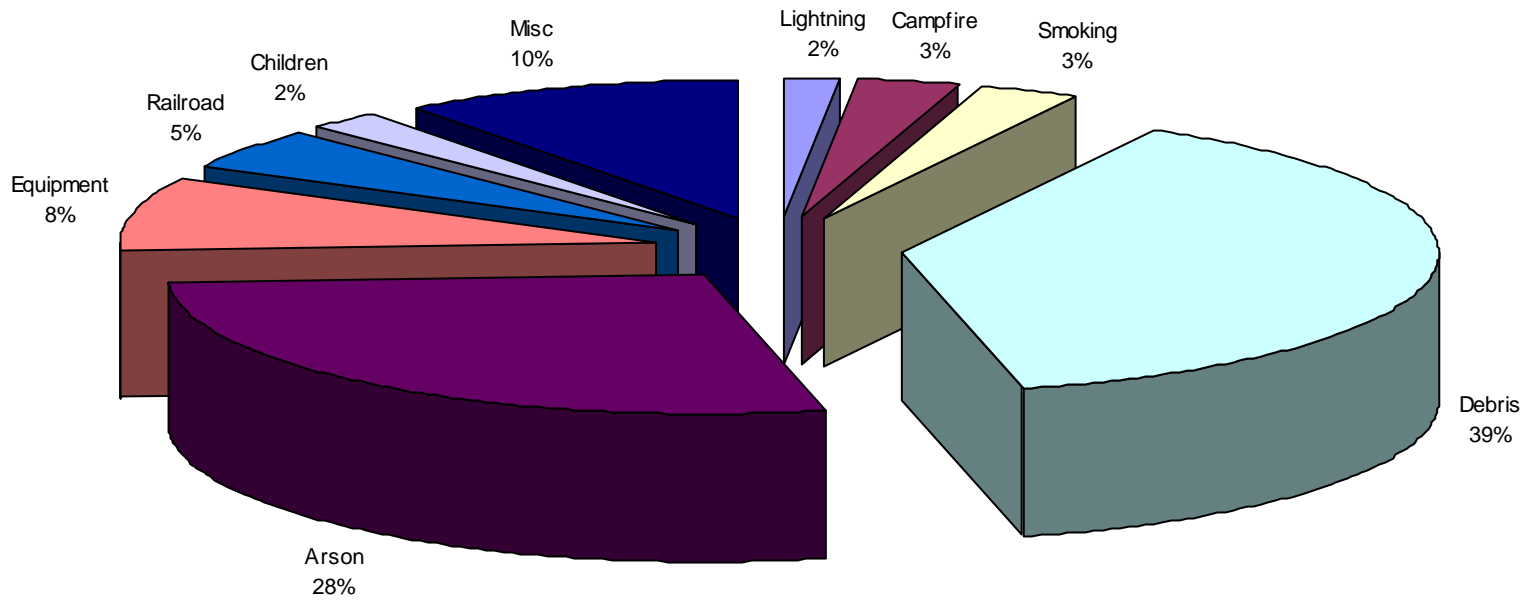
(f) Fire costs are no longer paid from the Forestry division's general appropriation. In FY 03, just prior to this change, the 10 year average was \$2,266,992

(g) Fire assistance to federal partners and other states that is reimbursed to the state

MN DNR Wildfires by Year 1989-2008



MN DNR Average Wildfires by Cause 1989 - 2008



Attachment 6

CL – 215 AIR TANKER OWNERSHIP and OPERATION COSTS FY 2008

State Owned (2 aircraft):

Availability Cost: 232 days @ \$5,782.00	=	\$1,341,424.00
Availability Cost: 168 days @ \$5,995.00	=	\$1,007,160.00
(rate change 4/15/2008)		
400 days availability total	=	\$2,348,584.00

Flight time: 75.13 hrs @ \$3,695	=	\$277,605.00
Flight time: 101.23 hrs @ \$3,698	=	\$374,349.00
Flight time: 3.06 hrs @ \$3,761	=	\$ 11,508.00
Flight time: 1.27 hrs @ \$3,794	=	\$ 4,818.00
Flight time: 33.23 hrs @ \$3,858	=	\$128,201.00
Flight time: 2.42 hrs @ \$3,889	=	\$ 9,411.00

Total state flight time (216.34 hrs) / cost = \$ 805,893.00
(Flight rate changes due to increase in fuel price)

Annual liability insurance policy \$ 32,250.00

Ownership Cost: \$3,186,727.00

Reimbursements via MNICS/GLFFC partners flight time (143 hrs) = \$ 714,337.00

Net Ownership and Operation Cost: \$2,472,390.00

Discussion:

The DNR purchased two Canadair CL-215 water scooping aircraft in FY 2001. The cost for both aircraft was \$6,390,000. The purchase was financed by borrowing at the direction of the Department of Finance. This debt was retired in December 2005

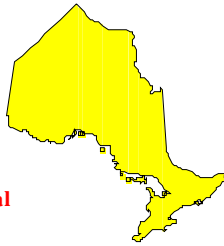
Components of ownership costs include liability insurance and a contract to operate, maintain, and repair the aircraft. Contract costs comprise flight time and availability amounts paid to the contractor.

- 1) Liability Insurance - protects the state from the loss of the aircraft.
- 2) Flight time - is an hourly rate paid to the contractor that operates the aircraft for hours actually flown on firefighting missions.
- 3) Availability is a daily rate paid to the contractor that operates the aircraft. This covers the annual costs of having the aircraft "ready to fly" for the required 200 days per year (which is the anticipated season of need in this state).

FY '08 CL-215 Dispatches

Red text indicates reimbursable missions

Ontario Fires
 55 drops
 77,000 gallons
 Cost: \$24,498
 Protected: Natural Resources



Michigan Fires
 123 drops
 172,200 gallons
 Cost: \$249,564
 Protected: Structures & Natural Resources

