

How much fire management can we afford? Changing economic constraints to fire management in interior Alaska.



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Motivation

- According to U.S. Forest Service (2003)
 - 99% of all fires are extinguished in initial attack
 - 80% of all fire costs generated by 2% of total fires
 - Alaska 2004, approx. 6.5 million acres and \$148 million in expenditures

Planning for Fire Suppression Costs

- National Fire Management Analysis (NFMAS) and FIREPRO Systems, based on Cost plus Net Value Change (C+NVC), represents total cost.
- Objective: Minimize C+NVC, suppression costs (C) reduce NVC (lower damage losses)
- NVC changes primarily due to reduced timber losses; traditionally did not include non-market values (e.g., environmental service flows)

Changing Perspectives

- Explicit recognition of need to re-incorporate fire into ecosystems
- 20 year avg. (USFS) suppression cost \$582/acre, \$51/acre for wildfire use

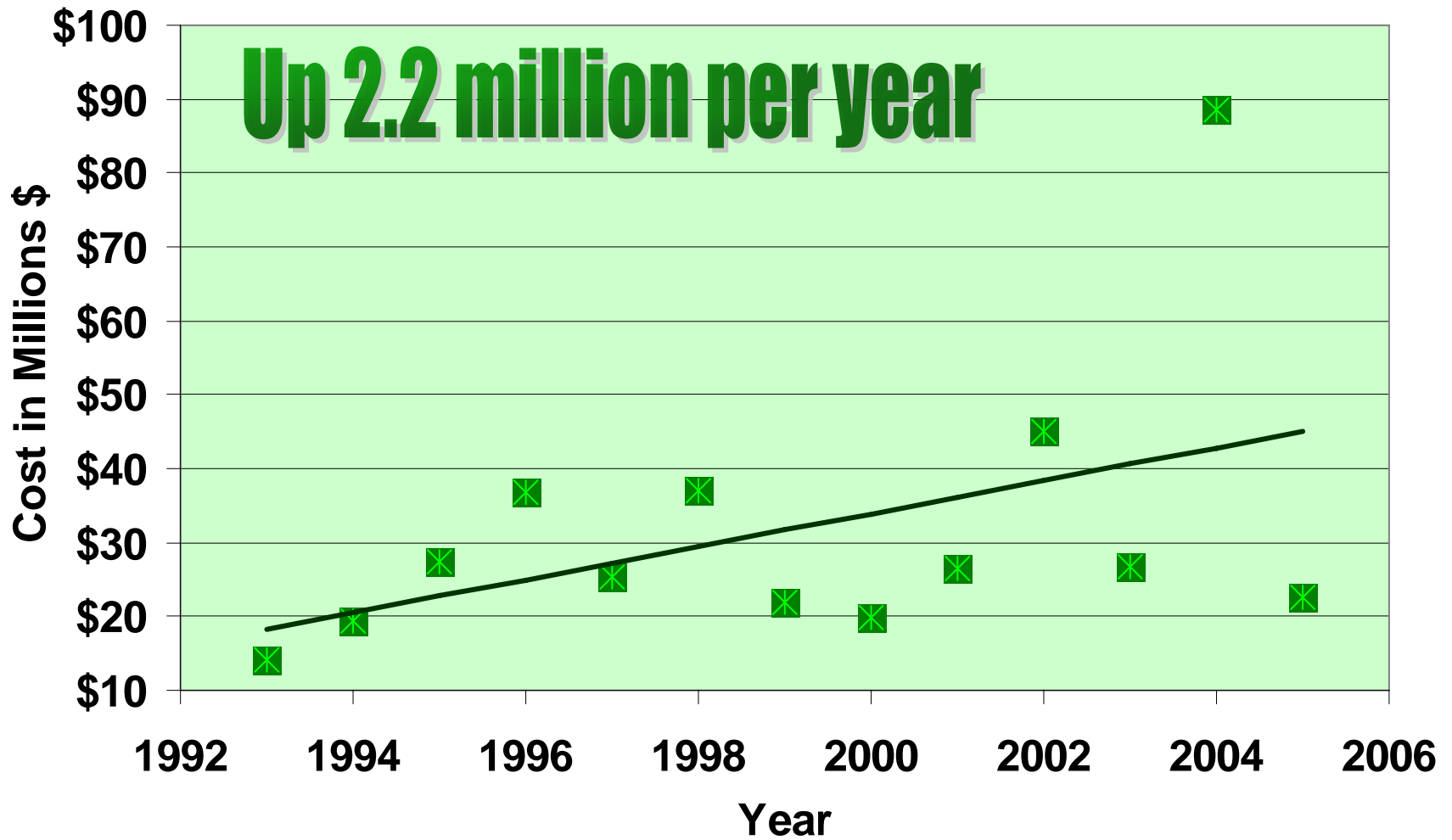
Preliminary Findings

- **State**
- **Federal**
- **Combined**
- **Average Costs Per Acre & Per Fire**

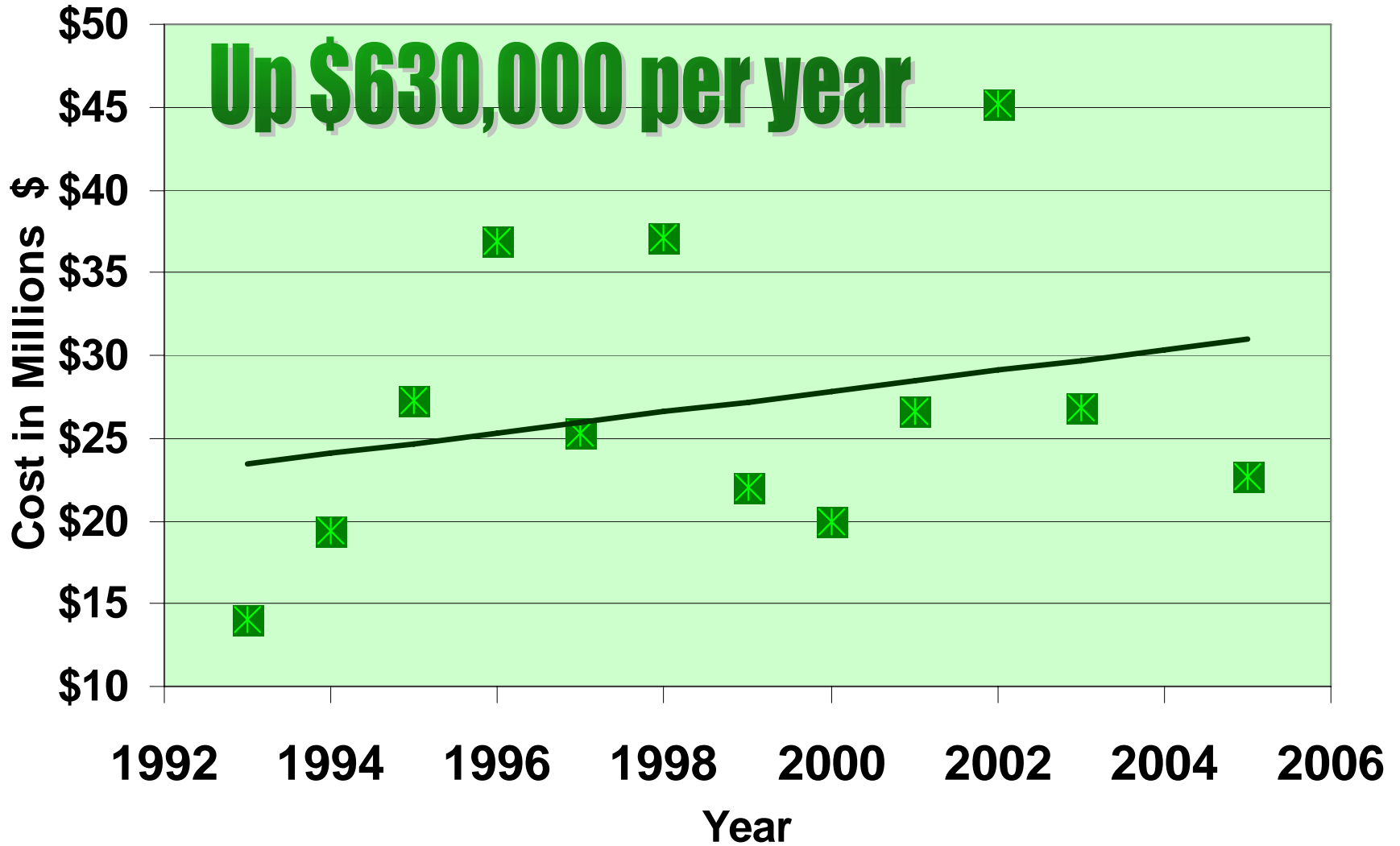
A Breakdown of State & Federal Suppression Expenditures in Alaska

Year	Federal	State	Total State & Federal Costs
1997	\$17,904,842	\$25,318,700	\$43,223,542
1998	\$19,365,050	\$37,120,900	\$56,485,950
1999	\$12,521,839	\$21,989,500	\$34,511,339
2000	\$15,337,406	\$19,938,100	\$35,275,506
2001	\$20,537,374	\$26,578,200	\$47,115,574
2002	\$21,257,412	\$45,137,600	\$66,395,012
2003	\$16,949,436	\$26,783,200	\$43,732,636
2004	\$59,644,069	\$88,592,200	\$148,236,269
2005	\$41,341,580	\$22,707,500	\$64,049,080

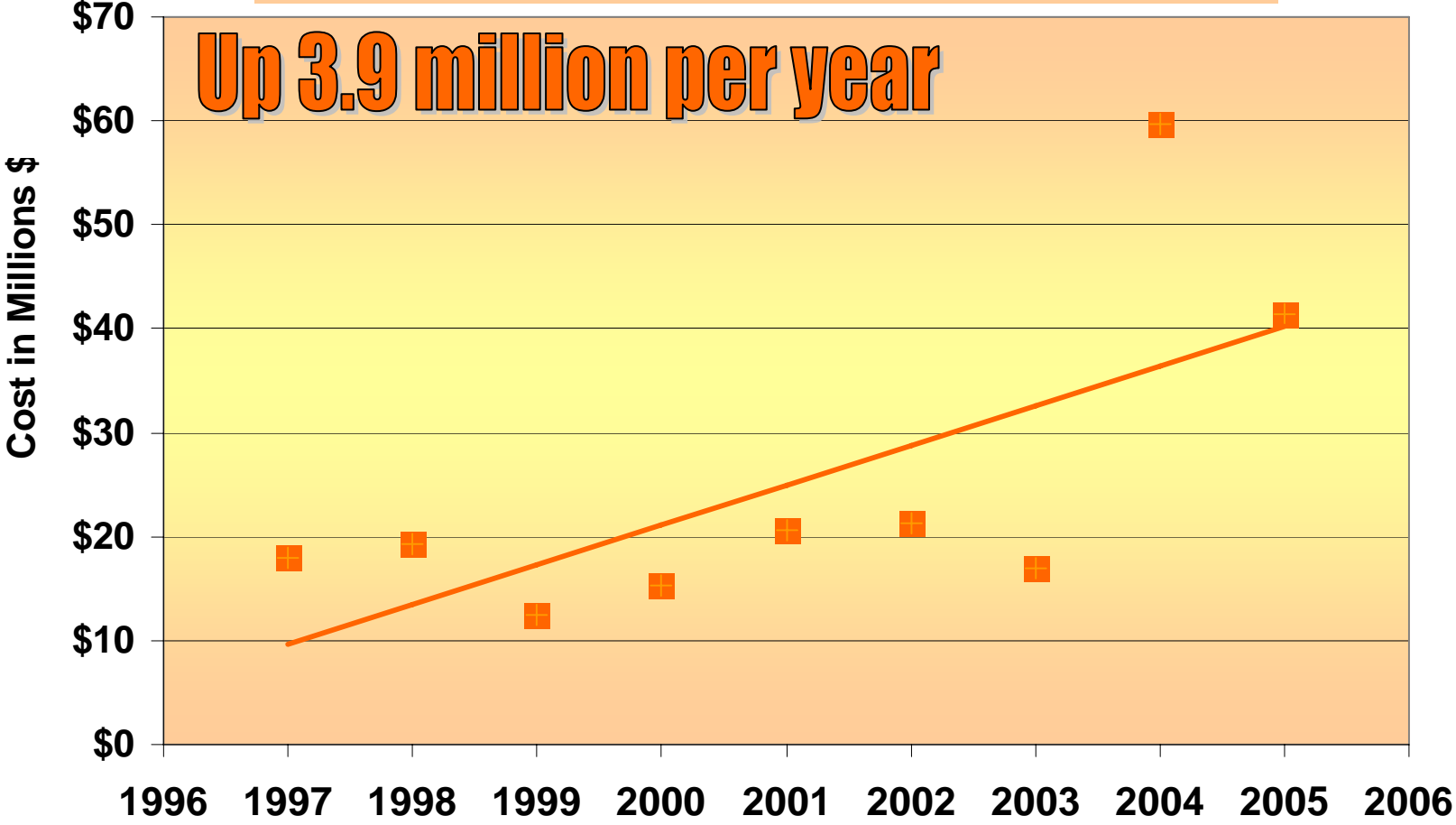
Inflation-Adjusted Suppression Costs for Fires on State Land



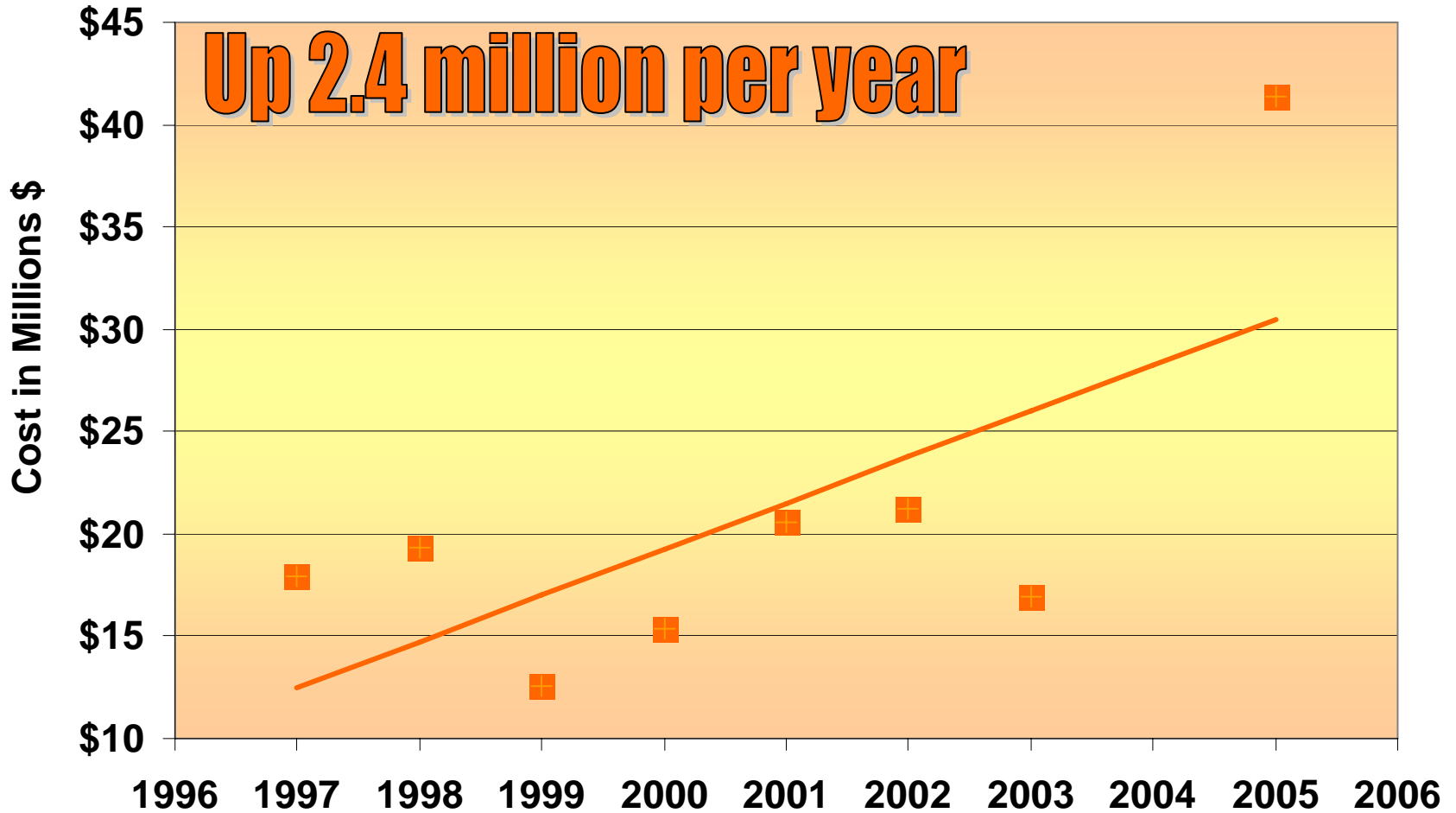
Real Suppression Costs for Fires on State Land without 2004 Season



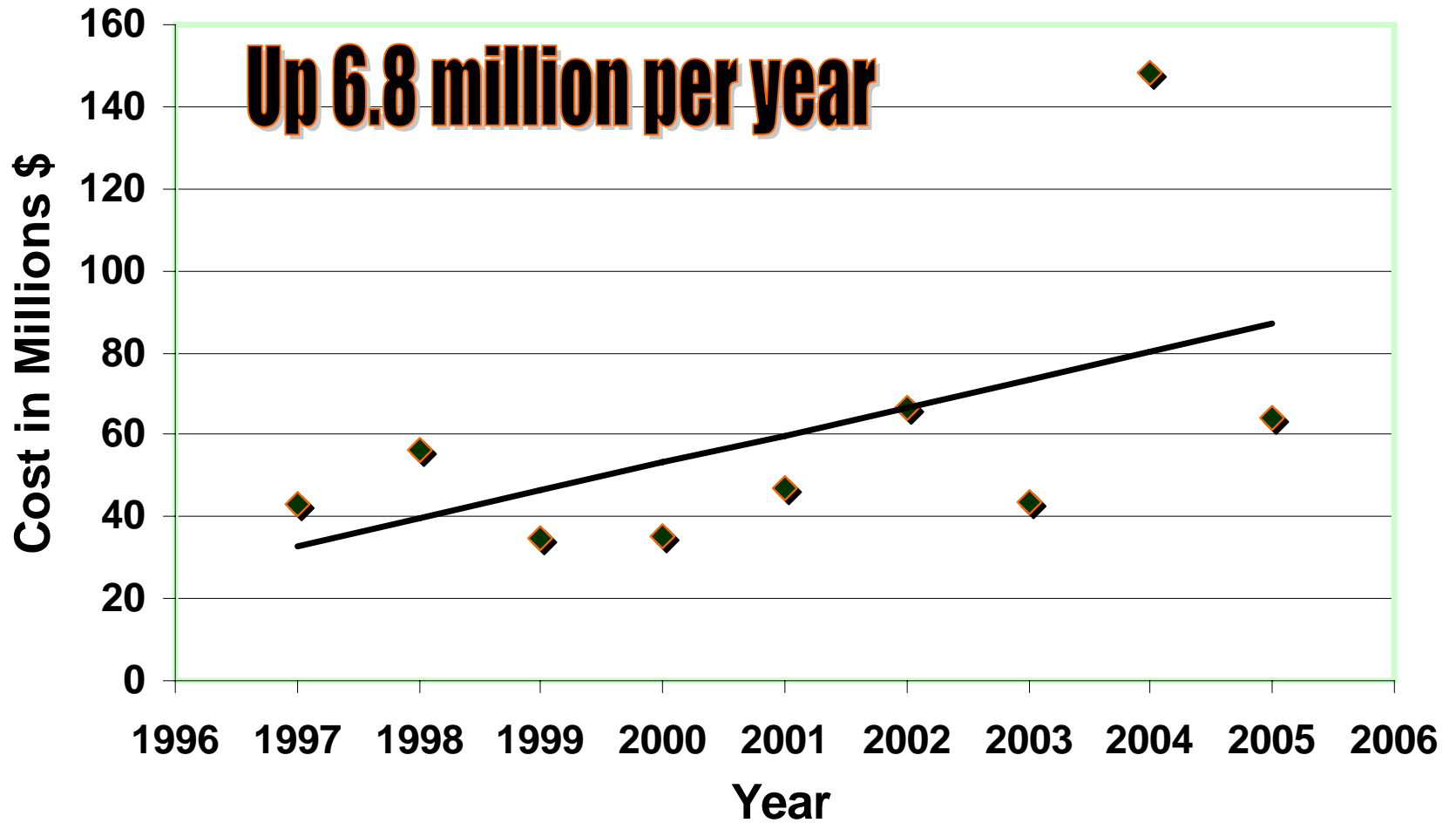
Federal Suppression Costs



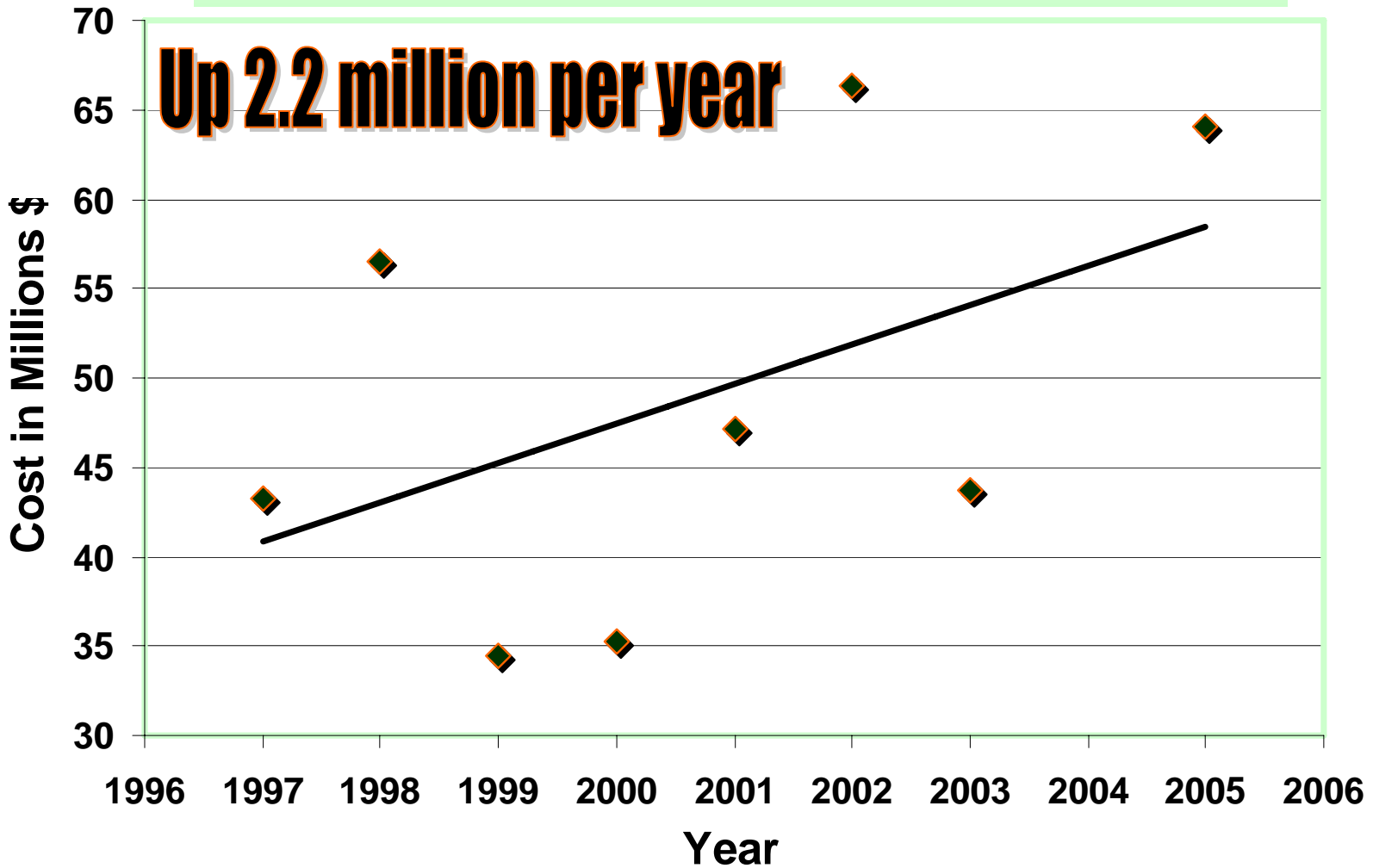
Federal Suppression Costs without 2004



Total Federal and State Suppression Costs



Total Federal and State Suppression Costs without 2004



Cost averaged over acre and fire

Year	Acres of Fire Activity	Cost Per Acre	# Fires	Cost Per Fire
1997	2,026,899	\$21	773	\$55,917
1998	120,752	\$468	412	\$137,102
1999	1,005,428	\$34	486	\$71,011
2000	756,296	\$47	369	\$95,598
2001	98,720	\$477	321	\$146,777
2002	2,183,363	\$30	543	\$122,274
2003	602,718	\$73	476	\$91,875
2004	6,523,182	\$23	696	\$212,983
2005	4,663,880	\$14	624	\$102,643
Averages	1,997,915	\$132	522	\$115,131

Key Factors Driving Fire Costs

- **Extent of rural-urban interface**
- **The use of aviation assets**
Ex. McGrath – aircraft logistics & support costs
- **Climate Change**
 - Longer Season
 - July Rains
- **Training/Safety Costs**



How do public and political pressures to act affect resource allocation?

- Action taken where wouldn't otherwise – i.e. greater expense to monitor and map the Wild Lake fire in a limited zone.
- Inconsistent application of policy also has a cost
- Creates a political need to make it look like something is being done - Commissions.

What is the relationship between suppression expenditures and values at risk?

- They should be very closely tied
 - wide range of values
 - hard to quantify
 - 1) Life
 - 2) Property
 - 3) Resource values – timber values, fisheries, wildlife
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- Ecosystem has developed with fire; if suppressed potential to damage non-market values.



Are there economic constraints?

- Federal
 - Preparedness
 - Suppression – Ask Congress for money
- State
 - Preparedness
 - Suppression – Legislature ratifies

What are the constraints on equipment and personnel?

- 2004 - brought in resources from lower 48
 - Type six engines
- Alaska's fire season Memorial Day to after July 4
- Lower 48 August to September
- Alternating big fire years

Direction for further research

Data

- Costs broken down by Critical, Full, Modified, Limited FMO
- Costs broken down by community to assess economic impacts
- Costs broken down by preparedness and suppression

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