



Bulkley Valley-Lakes District Air Quality

2006 Ambient Air Quality
Assessment: June AGM & Public Forum

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Ministry of Environment

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Table 3-3 General Goals, Indicators and Strategies (page 3-8)

Goal	Indicators	Strategies
1) Gain better understanding of air quality in plan area	<p>Comparison of PM_{10} and $PM_{2.5}$ concentrations at locations in BVLD</p> <p>Comparison of $PM_{2.5}$ concentrations at locations around the province for CWS attainment.</p>	Expand AQ & meteorological modelling network

Table 3-3 General Goals, Indicators and Strategies (page 3-8)

Goal	Indicators	Strategies
2) Continuous improvement in air quality in the BVLD	<p>Mean annual PM_{10} and $PM_{2.5}$ concentrations</p> <p>Reduce % of days where average daily PM_{10} concentration > 50 and $PM_{2.5} > 30$ $\mu\text{g}/\text{m}^3$. Interim goal = 0.5%</p> <p>% of PED "potential episode days" where PM_{10} 24 hour average is > 25 $\mu\text{g}/\text{m}^3$ and $PM_{2.5} > 15$ $\mu\text{g}/\text{m}^3$ by year and/or season</p>	<p>Reduce/eliminate episodes via source specific emission strategies</p> <p>Education/operational changes to improve on AQ</p> <p>Bring forward emerging research & changing regulations and policies.</p>

BVLD - Continuous Ambient Air Monitoring Network

Station Name	Burns Lake Fire Centre	Houston Firehall	Smithers-St. Josephs	Telkwa
Station Location	#8 4 th Avenue	3382 11 th Street	4020 Broadway	1304 Birch Street
PM ₁₀	03 / 97- current	02 / 97- current	02 / 97- current	02 / 98- 10 / 05
PM _{2.5}	Installed 10 / 06	03 / 01- current	04 / 07- current	Installed 10 / 06
Meteorology	03 / 97- Current	11 / 94- current	11 / 94- current	01 / 98 - 10 / 05 10 / 06 - Current

Summary of active continuous monitoring for Particulate Matter and meteorology in the BVLD Airshed by the Ministry of Environment. *Telkwa Station was vandalized in mid-October, 2005 and was re-installed mid-October, 2006.

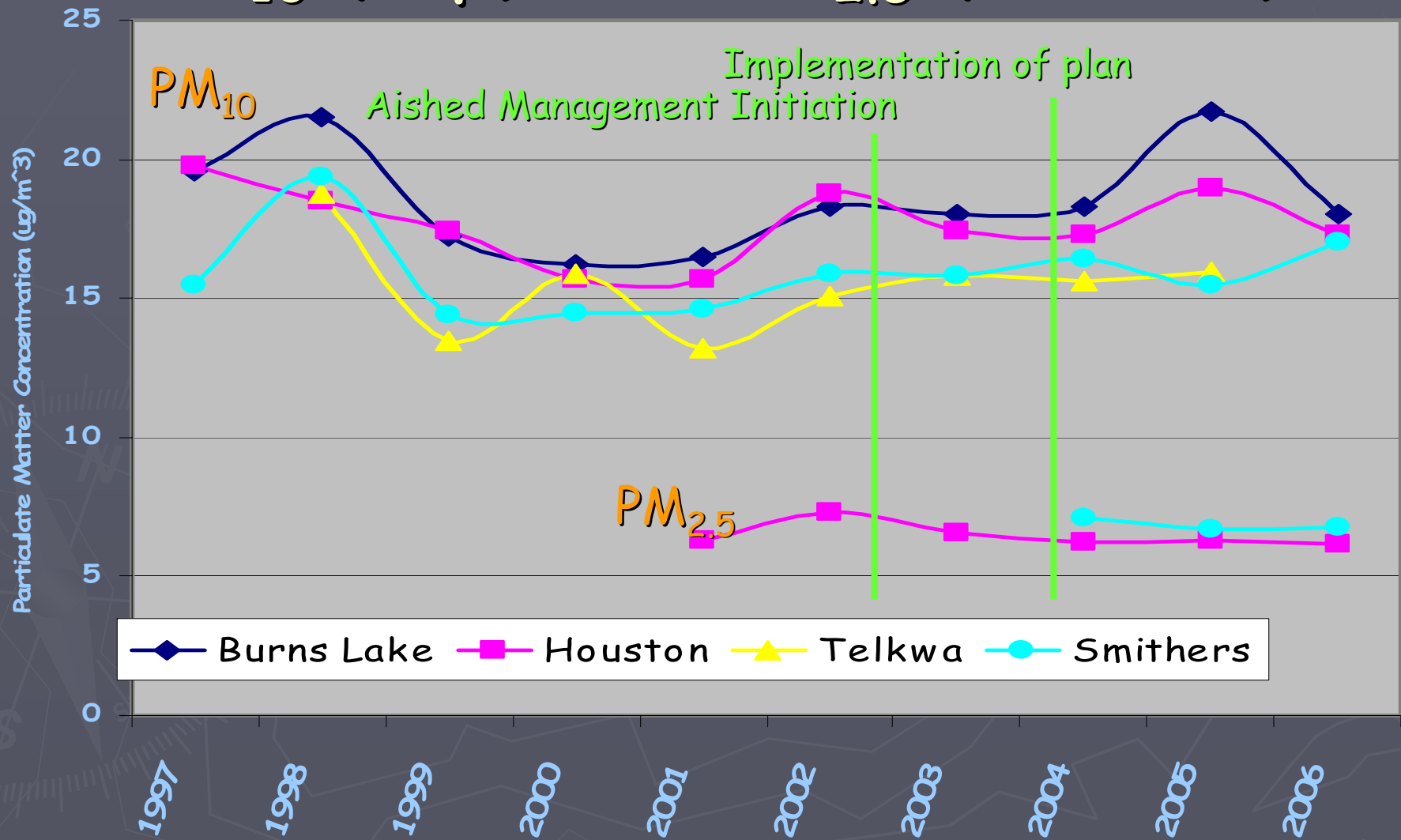
BVLD Non-Continuous Monitoring

Station Name	Hazelton	Kitwanga
Station Location	Northwest Community College	Kitwanga School
PM ₁₀	04 / 04 - current	04 / 04 - current
PM _{2.5}	04 / 04 - current	
Meteorology <i>(continuous)</i>	08 / 05 – current (at New Hazelton Elementary School)	01 / 05 - current

Summary of Active Non-Continuous Monitoring for Particulate Matter in the BVLD Airshed by the Ministry of Environment

Continuous Meteorological monitoring has now been installed in Kitwanga and Hazelton

Indicators: BVLD Annual Average PM₁₀ (top) and PM_{2.5} (bottom)



BVLD Air Quality Episode History

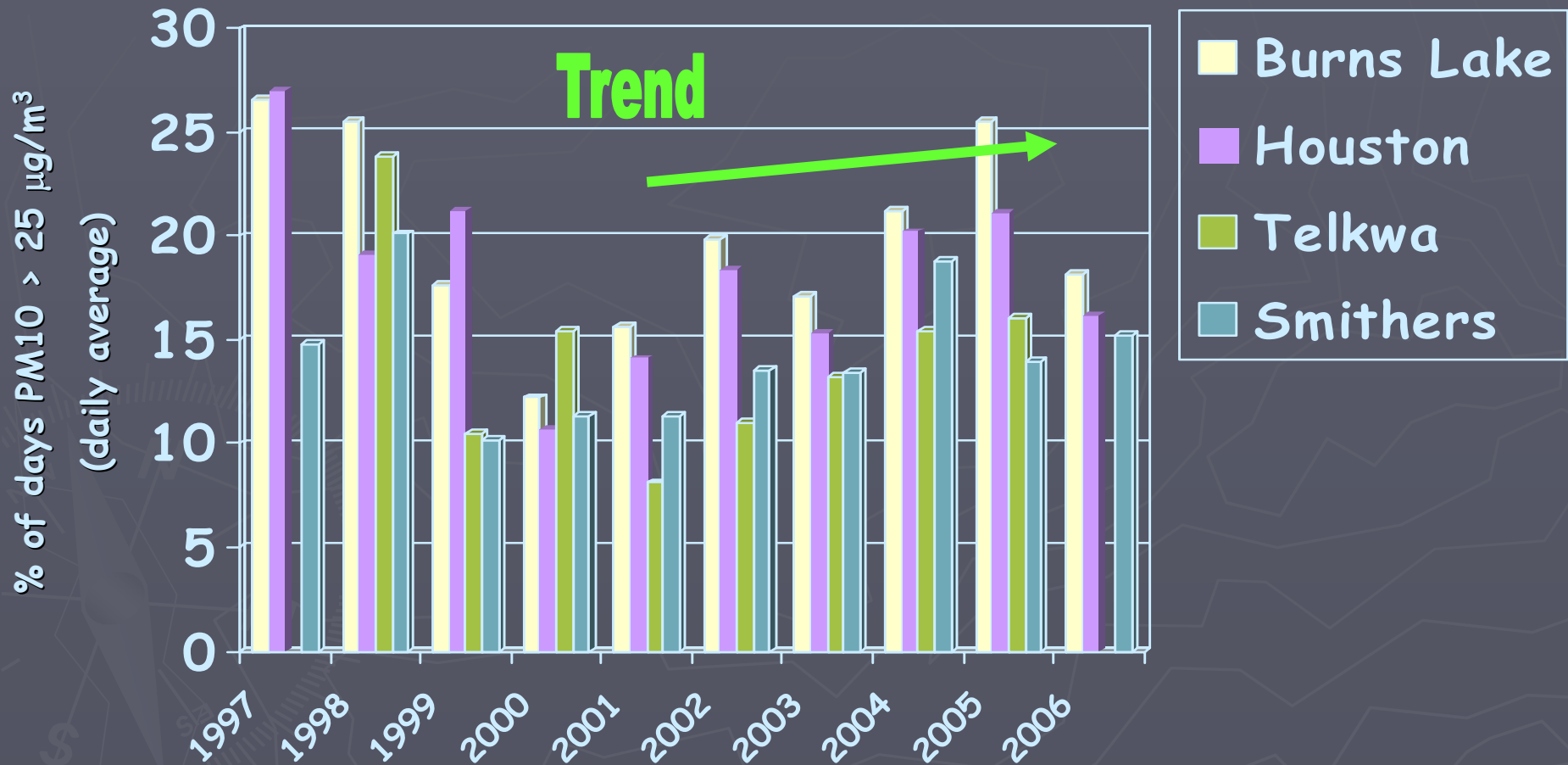
Month	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												



25 13 28 33 12 12 19 20 26 12 19 18

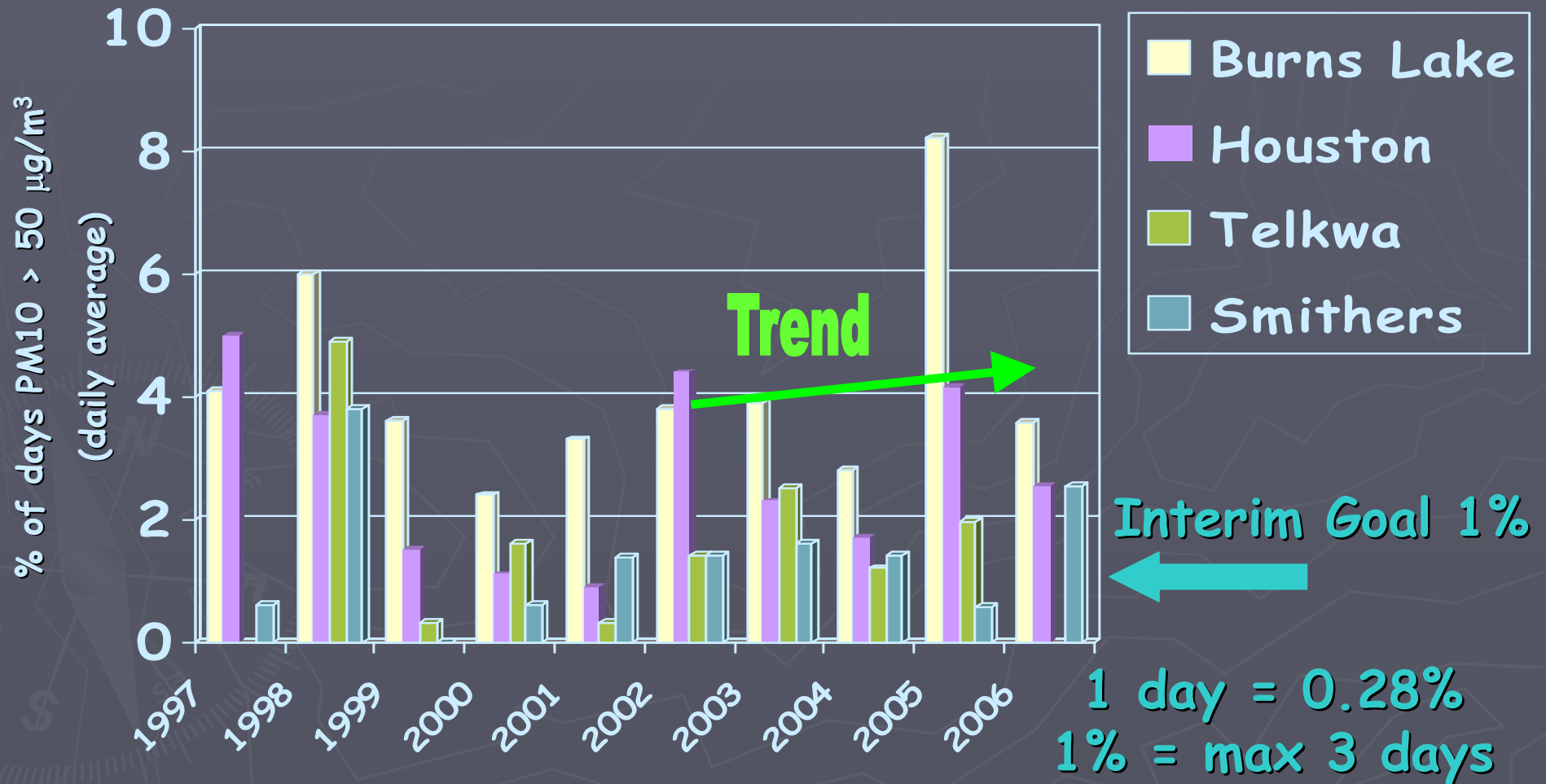
Numbers do not single out individual communities - think of airshed as a whole

Indicator: BVLD % PED $PM_{10} > 25 \mu\text{g}/\text{m}^3$ (daily average)



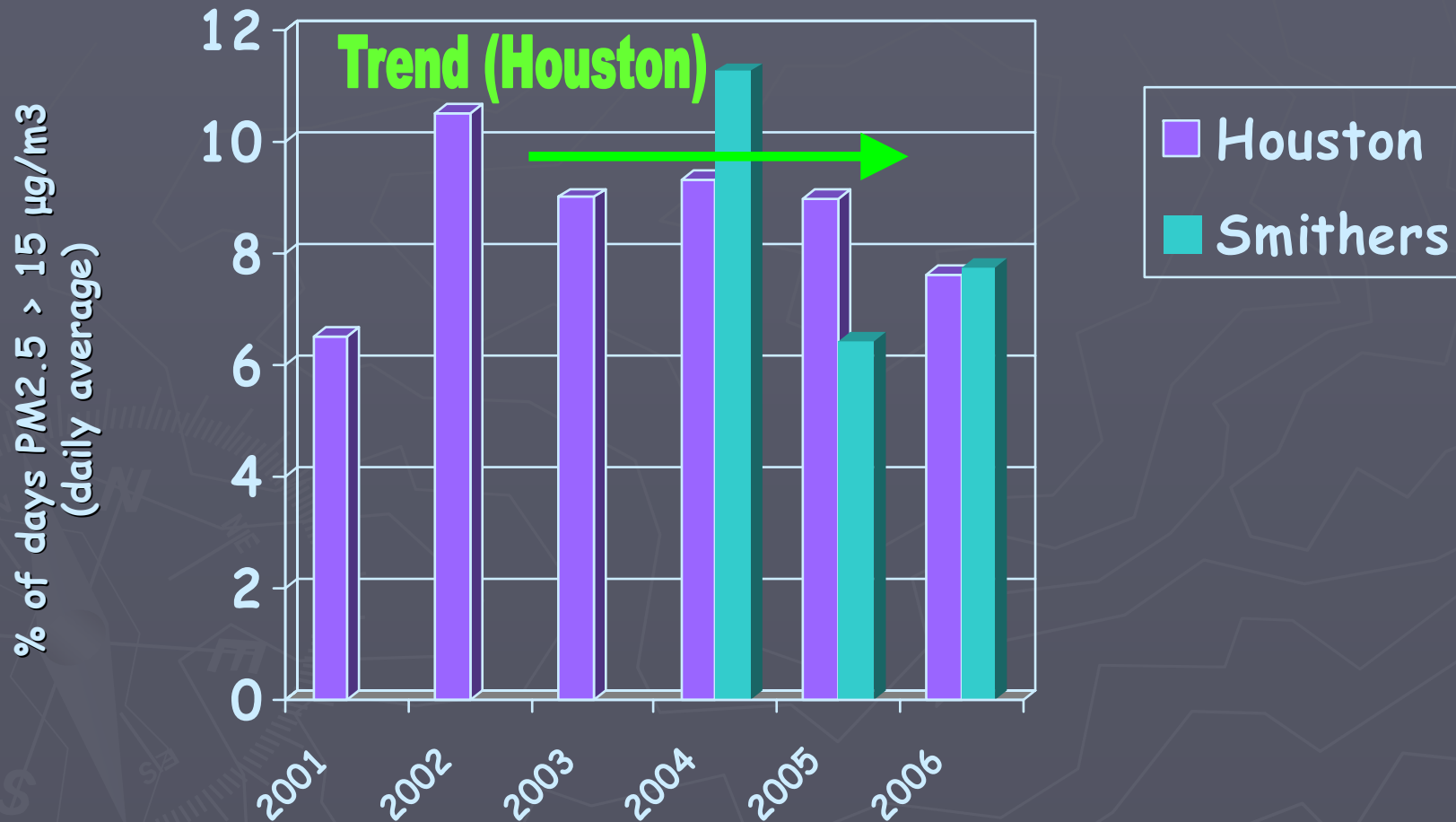
Note: These data include the % days $PM_{10} > 50 \mu\text{g}/\text{m}^3$
Note: Telkwa PM_{10} monitoring began in 1998 and ended in Oct 2005

Indicator: BVLD % days $PM_{10} > 50 \mu g/m^3$ (daily average)



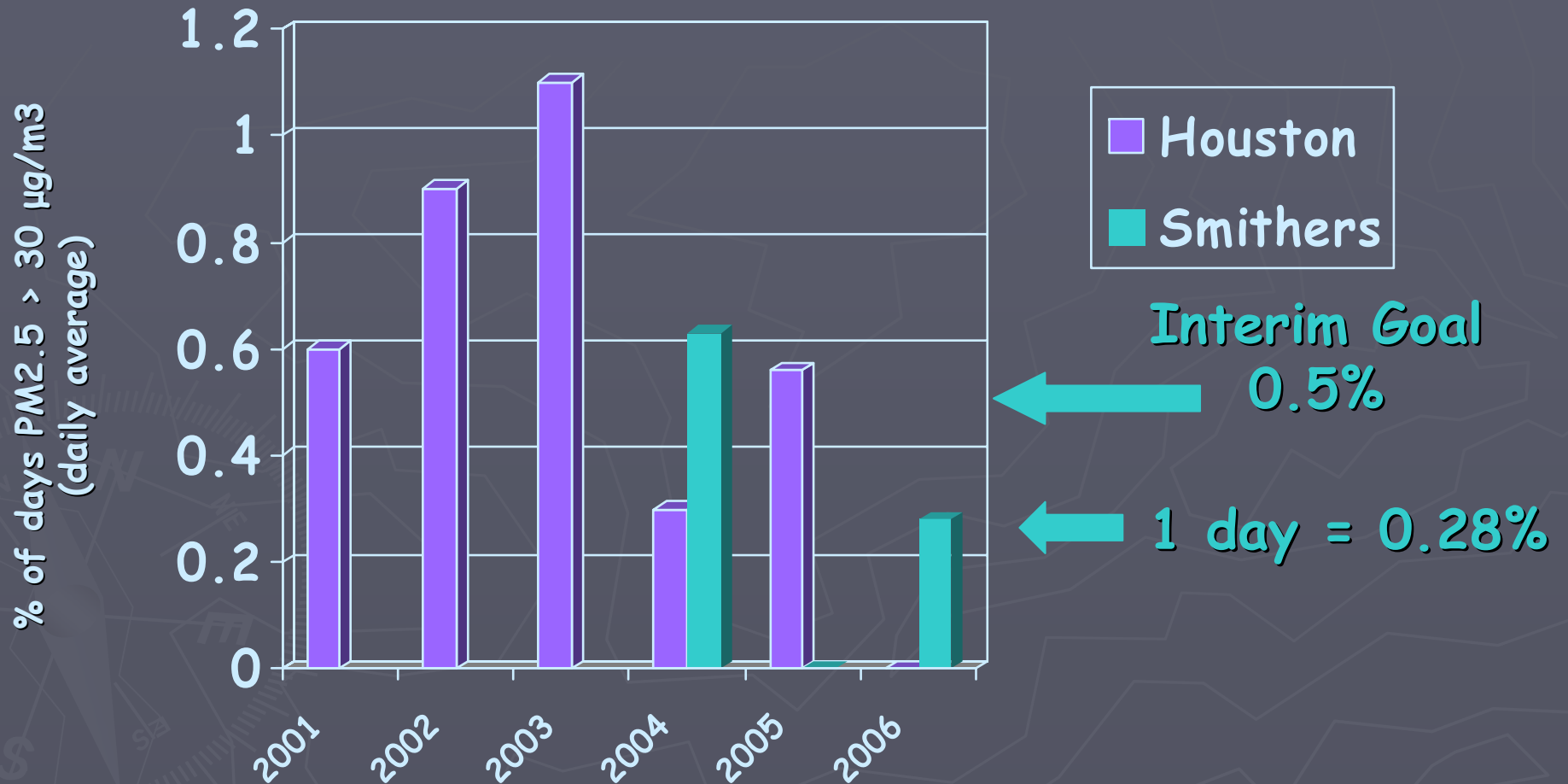
Note: Telkwa PM_{10} monitoring began in 1998 and ended in Oct 2005

Indicator: BVLD % PED $PM_{2.5} > 15 \mu\text{g}/\text{m}^3$ (daily average)



Note: These data include the % days $PM_{2.5} > 30\text{mg}/\text{m}^3$

Indicator: BVLD % days $PM_{2.5} > 30 \mu g/m^3$ (daily average)



Canada Wide Standard

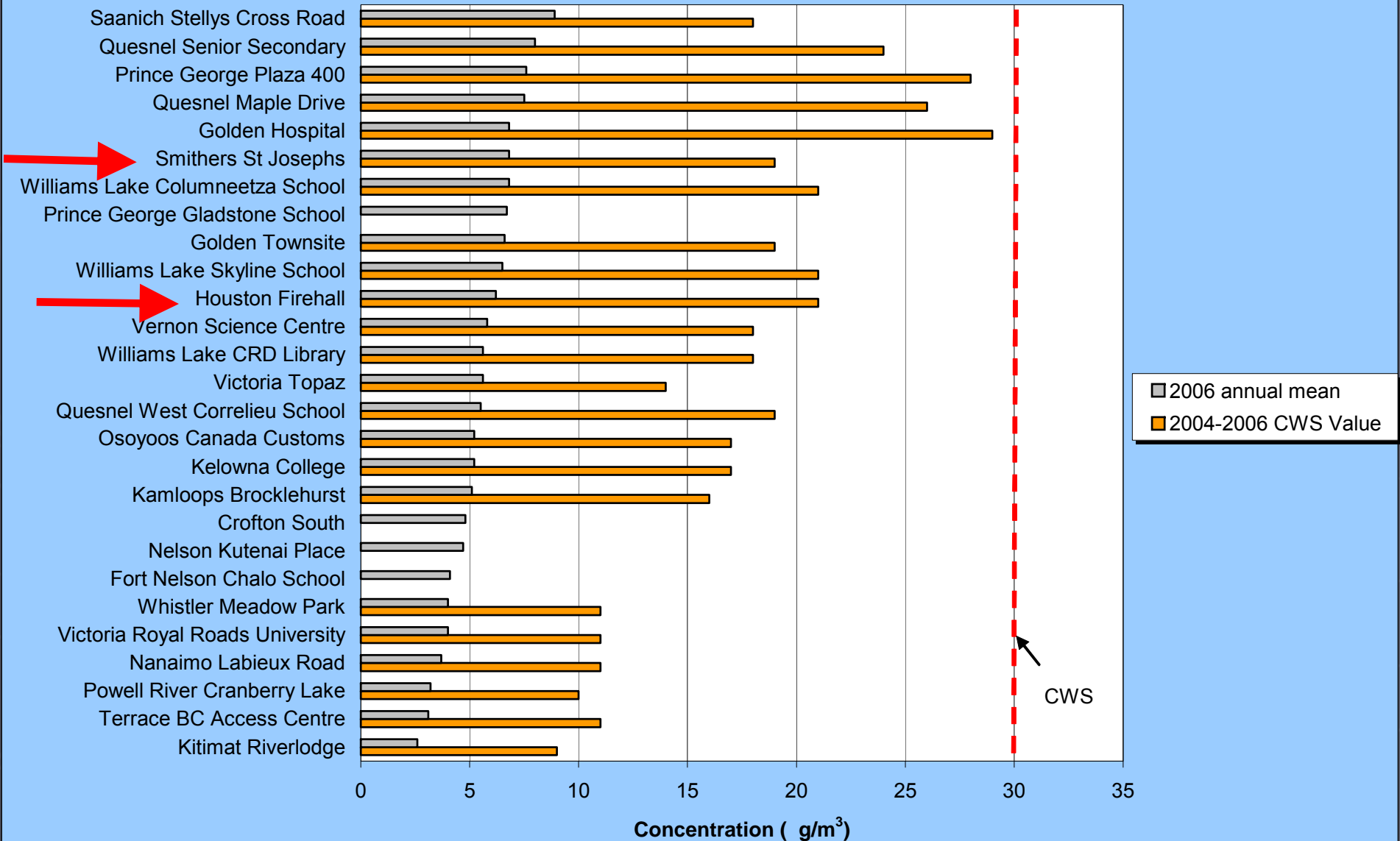
Achievement of the CWS for Particulate Matter ($PM_{2.5}$):

- ▶ The numerical target for the CWS for PM is $30\mu\text{g}/\text{m}^3$ (24-hr averaging time), based on the 98th percentile ambient measurement annually, averaged over three consecutive years.

2006 Provincial Picture

2006 ambient levels of PM_{2.5} across B.C.
(excluding LFV sites)

Smithers CWS Value: 19
Houston CWS Value: 21



Some Conclusions

► For PM10

- In Smithers, we're seeing increases in all indicators over short and long term.
- Houston and Burns Lake shows a decrease this year compared to last year and (but) overall steady increase in indicators.

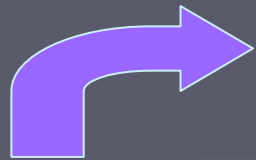
► For PM2.5

- Houston trend appearing but will take some time for other communities because monitoring has just begun

Case Study

- ▶ Air quality episode from November 30th until December 3rd, 2006
 - Began with Pollution Prevention Notice
 - ▶ limit open burning, industrial shutdown plans, voluntary emission reduction requests
 - Air Quality Advisory issued following day
 - ▶ health advisory, limit open burning, industrial shutdown plans, mandatory emission reduction requests
 - Cancelled on December 3rd.
 - ▶ All warnings lifted

Determining Impacts



Emissions

- *Wood stoves*
- *Industry*
 - *Permitted*
 - *Open Burning*
- *Motor Vehicles (highways)*

Dispersion, Transport and Distance

- *Wind speed*
- *Wind direction*
- *Vertical turbulence*



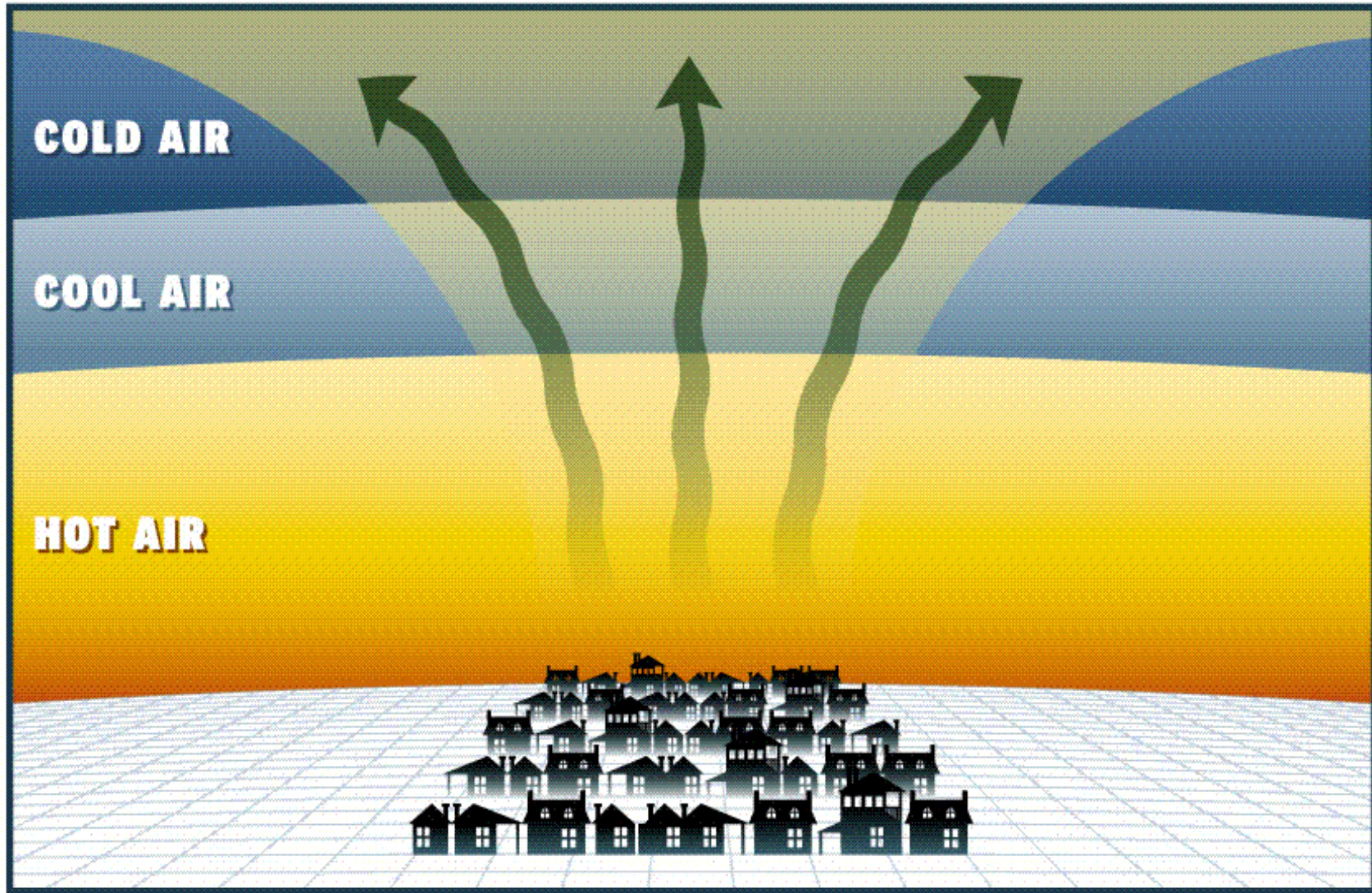
Receptors

- *City*
- *Wilderness*
- *Healthy person*
- *Asthmatic, cardiac or respiratory patient*
- *Children or elderly*



Good Vertical Turbulence

Afternoons on warm, sunny days



Poor Vertical Turbulence – temperature inversion

Calm, cold winter days; hot, hazy summer days; early morning all year



Open Burning November 30th, 2006



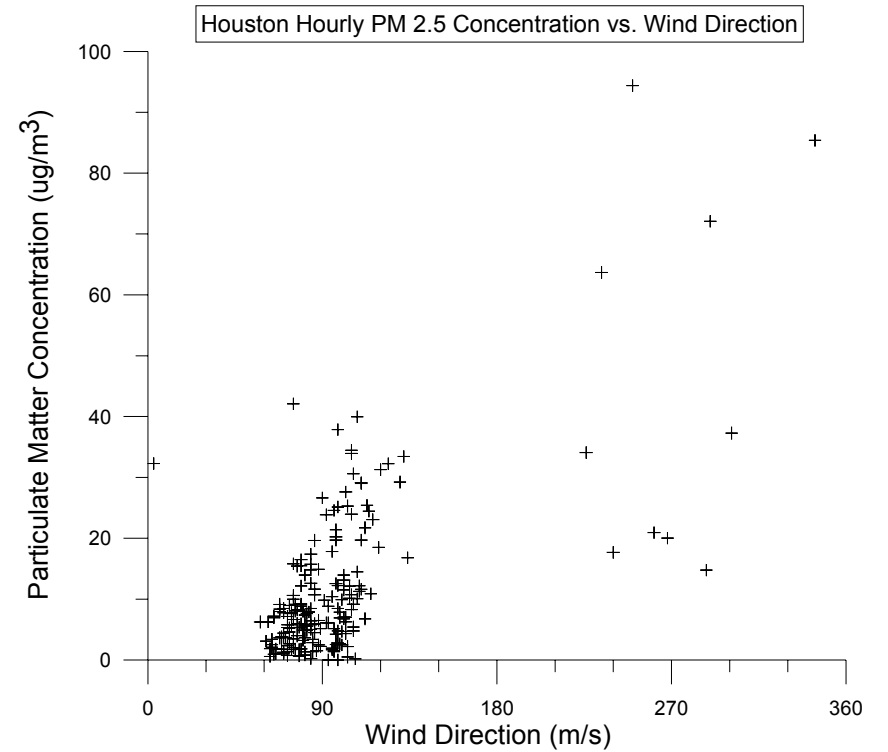
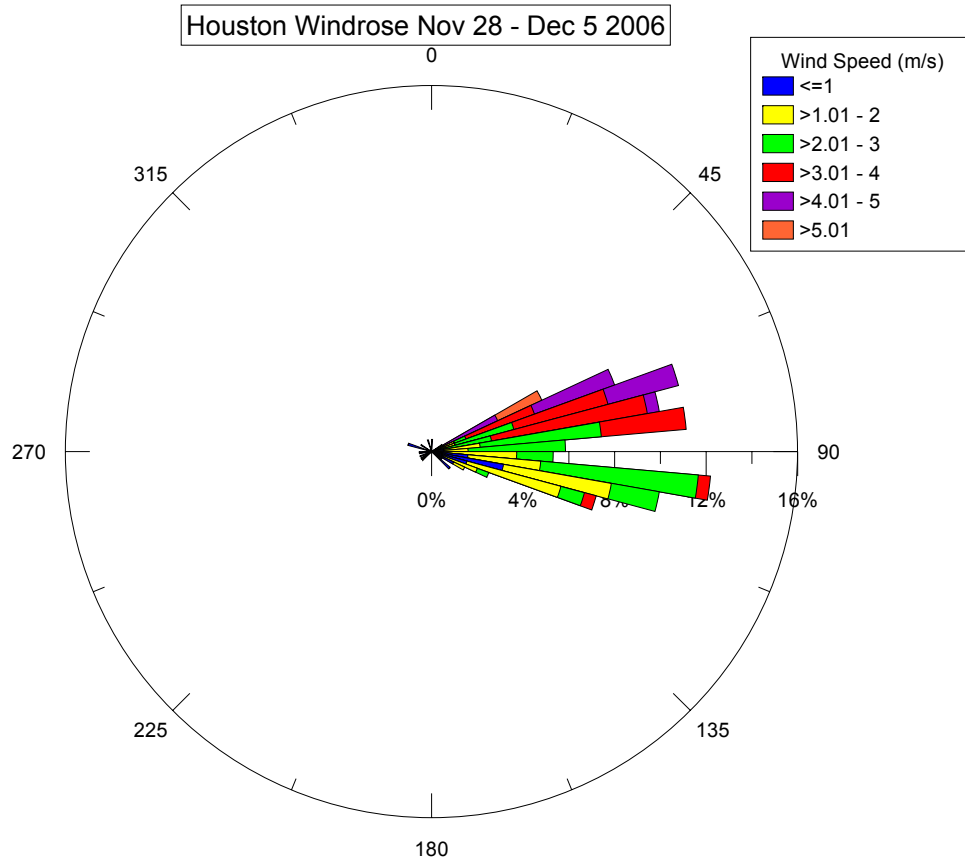
► This picture was taken near Canfor

Smithers Dec 1st, 2006

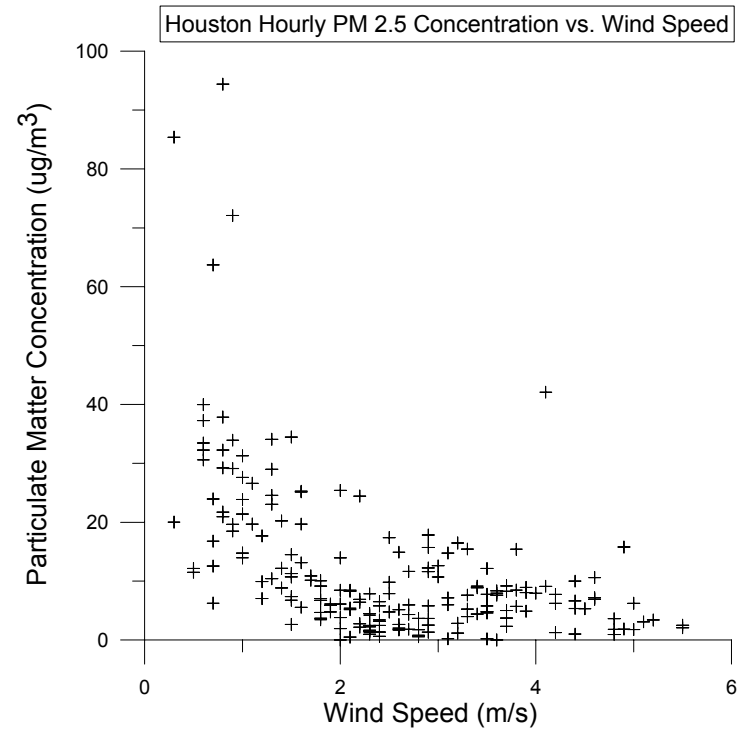
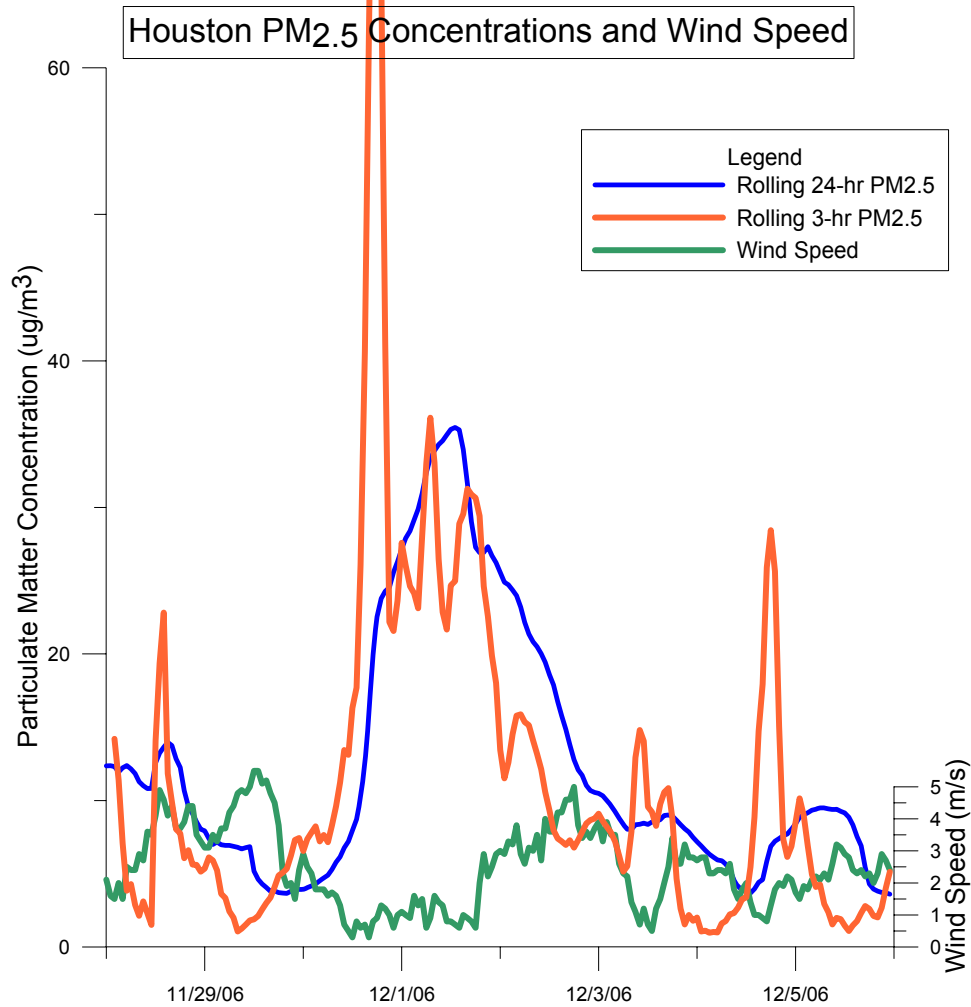


- ▶ This picture was taken from a vantage point on Hislop Rd.

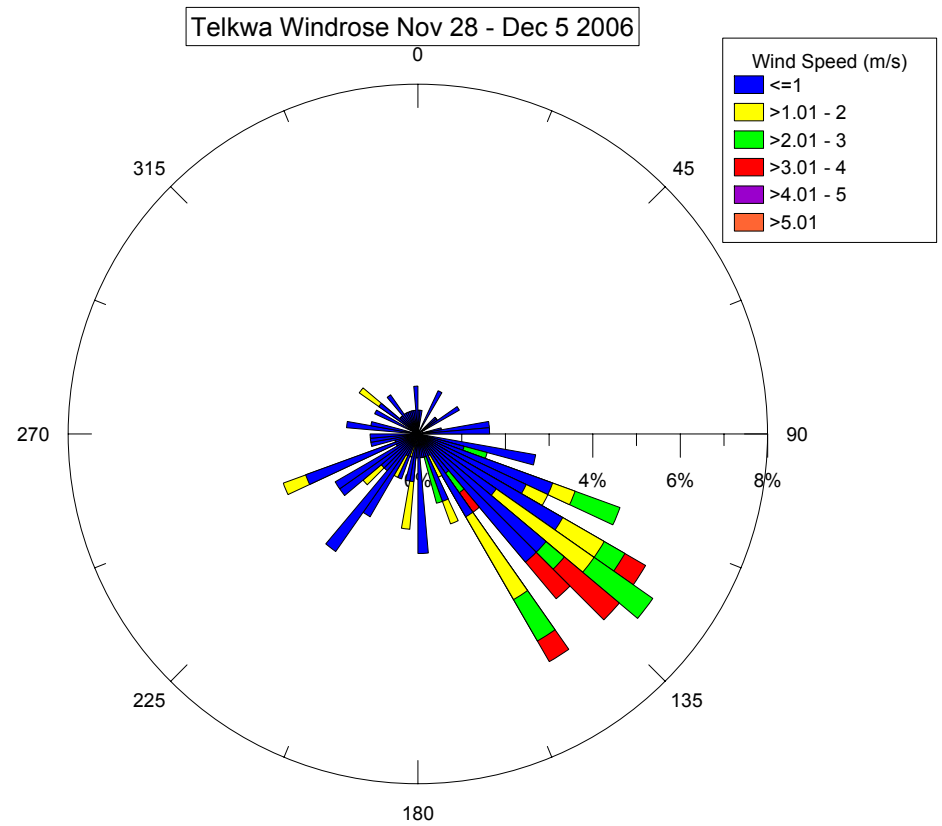
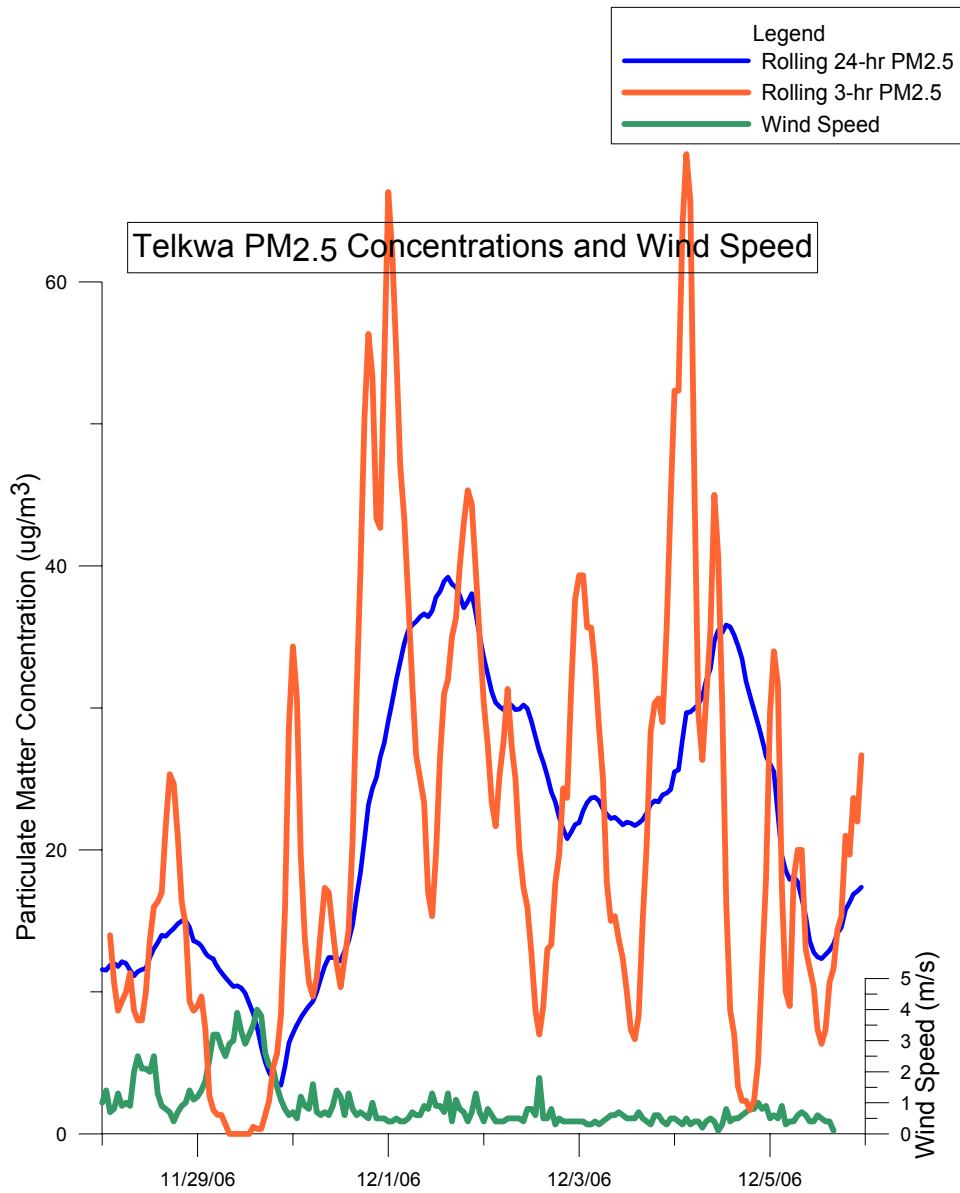
Houston – a closer look



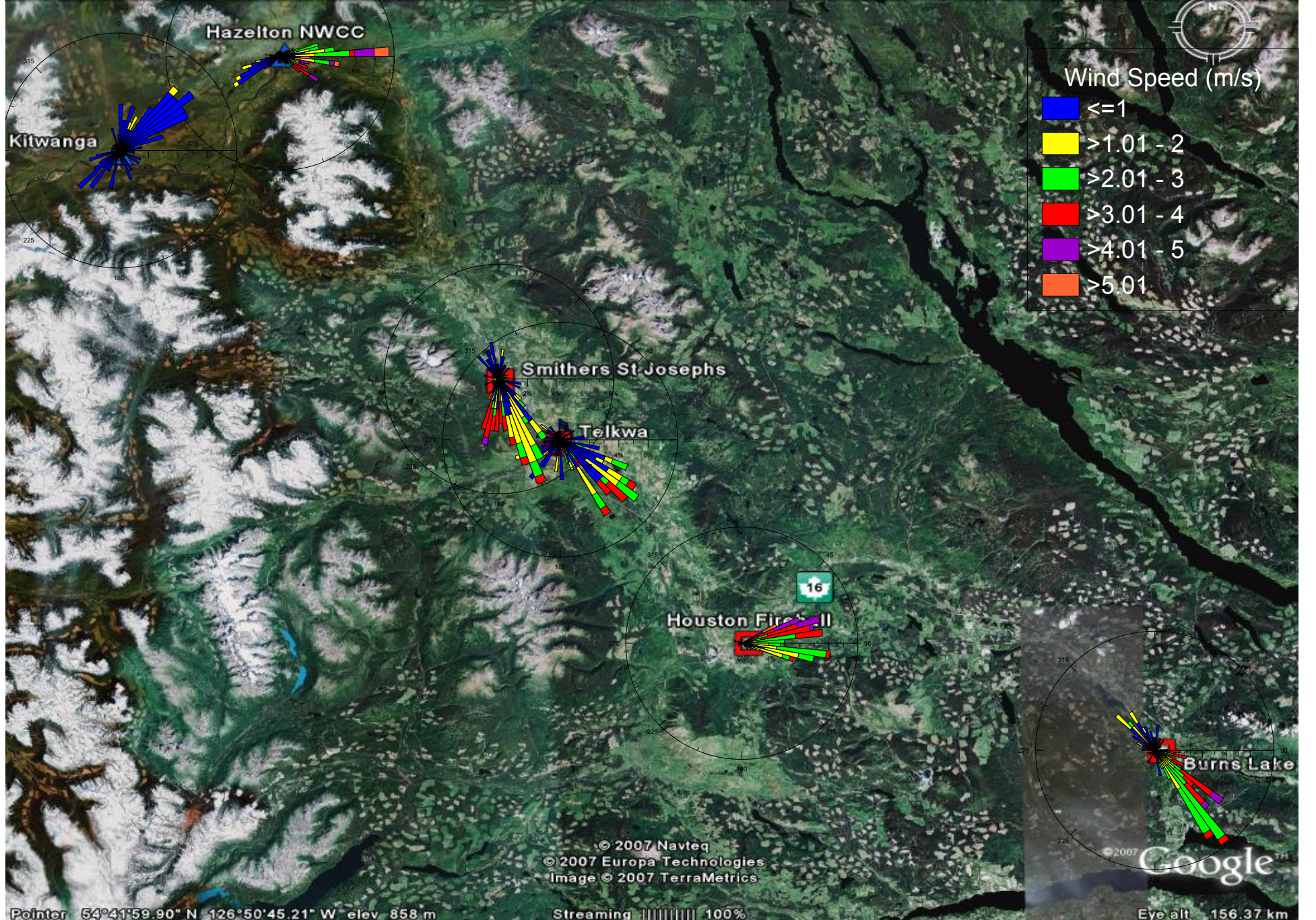
Houston – a closer look



Telkwa – very different



BVLD Air Quality Episode Case Study: Windroses Nov 28 - Dec 5 2006



Pointer 54°41'59.90" N 126°50'45.21" W elev 858 m

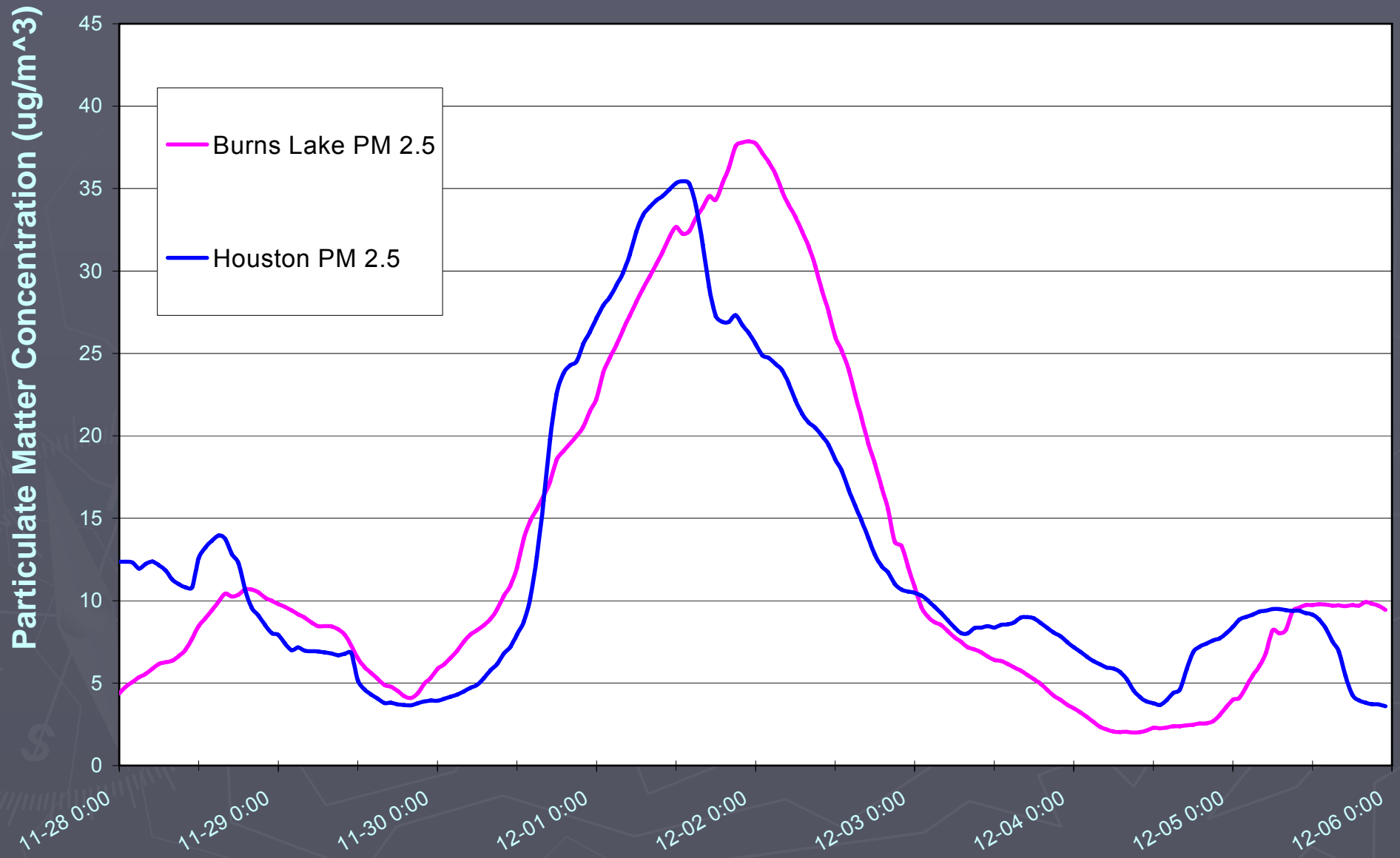
© 2007 Navteq
© 2007 Europa Technologies
Image © 2007 TerraMetrics

Streaming 100%

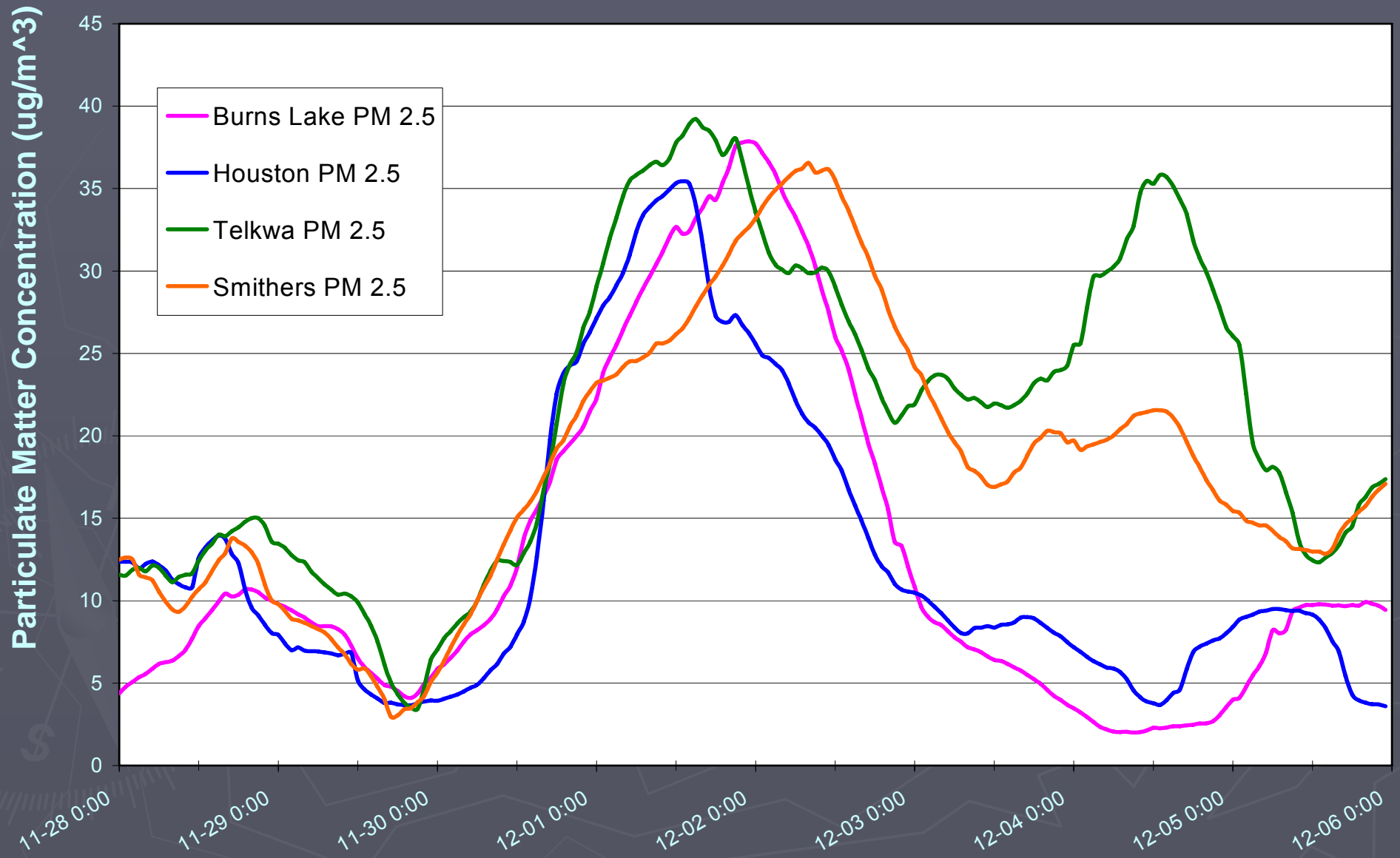
Google

Eye alt 156.37 km

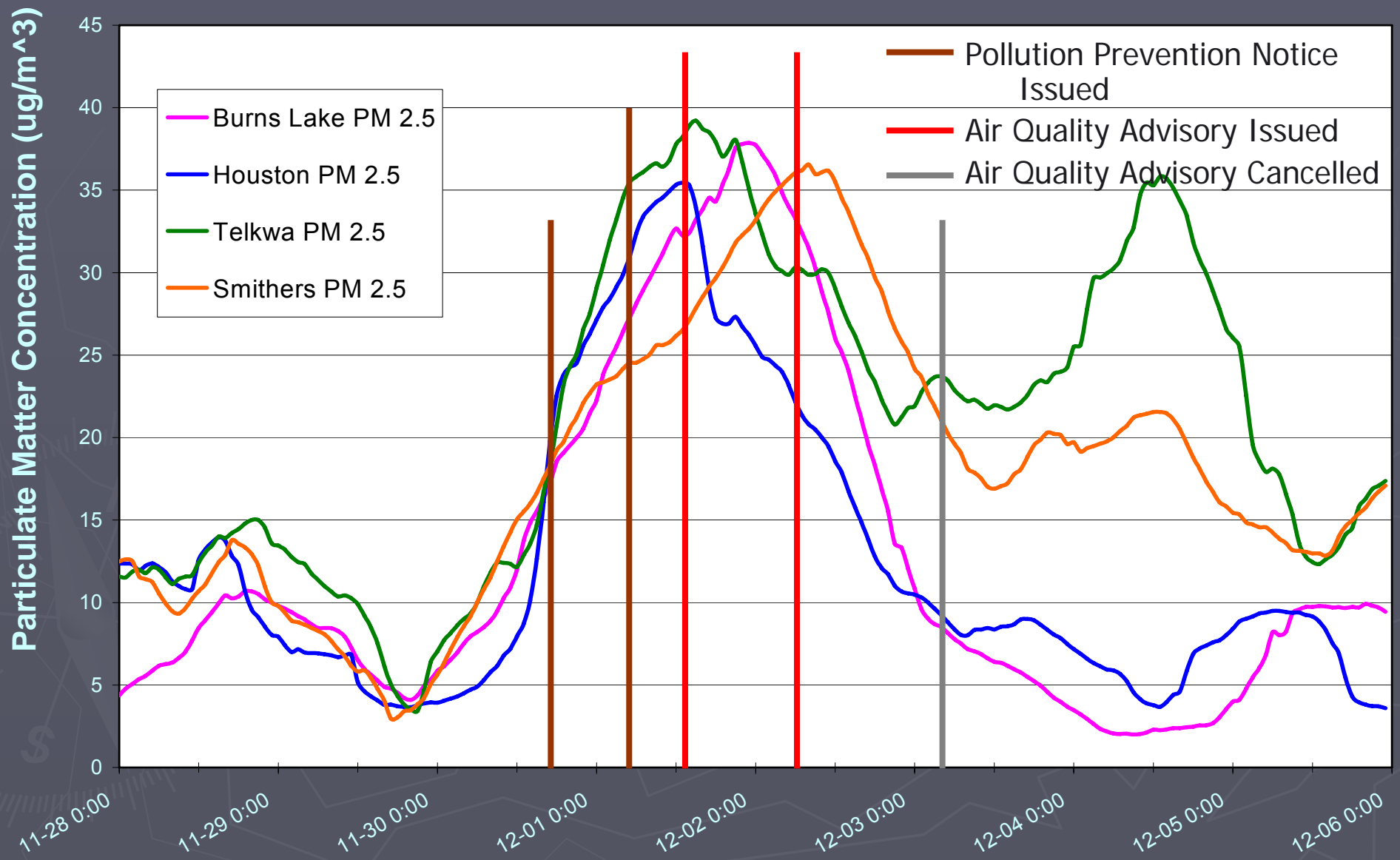
Case Study cont'd



Case Study cont'd



Case Study cont'd – MoE's response



Conclusions

- ▶ In this case, emissions, dispersion and transport (weather) acted against us
- ▶ This is a 'typical' winter AQ episode
- ▶ the Ministry of Environment responded timely though maybe not soon enough for Houston
- ▶ Look for Houston to be indicator for other communities
- ▶ Upcoming provincial policy and $PM_{2.5}$ guidelines will enable us to act sooner



thanks