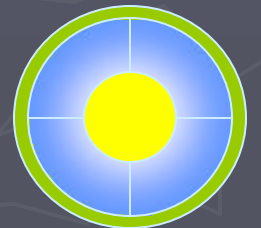
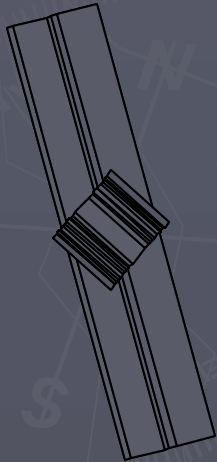


# Bulkley Valley-Lakes District Air Quality

A Presentation to the  
Lakes Community Working Group

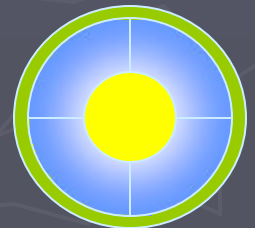
Christine Rigby  
Air Quality Meteorologist  
Ministry of Water, Land and Air Protection

April 23, 2003



# Overview

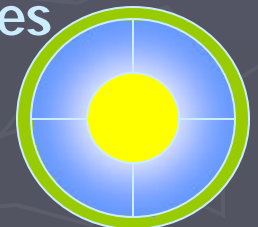
- ? BVLD monitoring network
- ? Exceedance vs. Exposure
- ? Provincial airshed ranking
- ? BVLD Air Quality Episode Summary
- ? Breakdown into Air Quality Index Categories
- ? Trend Analysis
  - Hour of day and day of week
  - Hour of day and month of year
- ? Temperature and Air Quality



# BVLD Monitoring Network

Station Name	Endako	Burns Lake Fire Centre	Houston Firehall	Smithers-St. Josephs	Telkwa
Station Location	Endako	#8 4 <sup>th</sup> Avenue	3382 11 <sup>th</sup> Street	4020 Broadway	1304 Birch Street
PM10		03/97-current	02/97-current	02/97-current	02/98-current
PM2.5			03/01-current		
Meteorology	07/97-current	03/97-current	11/94-current	11/94-current	01/98-current

Summary of Active Continuous Monitoring for Fine Particulates and Meteorology in the Bulkley Valley-Lakes District by the Ministry of Water, Land and Air Protection



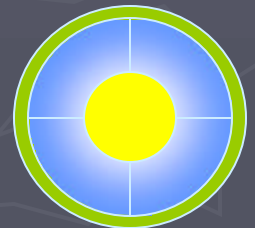
# Exceedance vs. Exposure

## ? Exceedance

- ✍ # of times air quality is greater than a defined level (ie. Provincial Objective)
- ✍ Frequency of occurrence

## ? Exposure

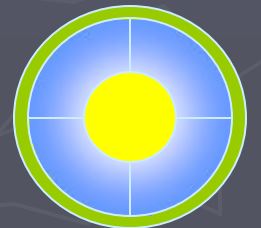
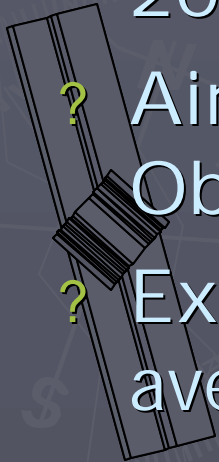
- ✍ The risk potential for adverse effects
- ✍ Magnitude of occurrence



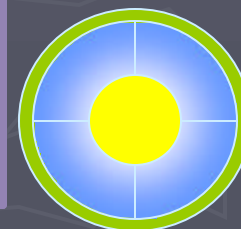
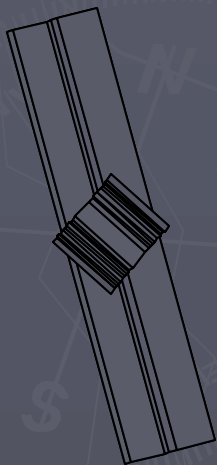
# Provincial Airshed Ranking

Ranking based on:

- ? Ambient PM10 levels
- ? Annual mean averaged over 3 years (1998-2000)
- ? Airsheds exceeding 50  $\mu\text{g}/\text{m}^3$  (Provincial Objective) 1% of the time or more
- ? Exposure (annual sum of daily PM10 levels averaged over 1998-2000)



Rank	Airshed	Average Annual Mean ( $\mu\text{g}/\text{m}^3$ )	Exposure/year
1	Vernon	26	9659
2	Golden	26	9426
3	Grand Forks	26	9401
4	Merritt	25	8964
5	Revelstoke	23	8305
6	Invermere	23	8273
7	Nelson	23	8256
8	Quesnel	22	7974
9	Castlegar	22	7945
10	Williams Lake	20	7289
11	Prince George	20	7123
12	Slocan	19	6926
13	Creston	19	6923
14	Chetwynd	19	6874
15	Taylor	18	6624
<b>16</b>	<b>Bulkley Valley-Lakes District</b>	<b>17</b>	<b>6167</b>
17	Penticton	16	5929
18	Bear Lake	15	5640
19	Victoria	15	5573
20	Kamloops	14	5266
21	Lower Fraser Valley	14	5172
22	Valemount	12	4391



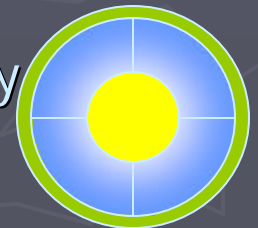
# BVLD Air Quality Episode Summary

Month	1995	1996	1997	1998	1999	2000	2001	2002
January								
February	1-3 days	7-9 days		4-6 days			4-6 days	
March	7-9 days	4-6 days	4-6 days	10+ days	4-6 days	7-9 days	7-9 days	4-6 days
April	4-6 days		10+ days	4-6 days	7-9 days		7-9 days	4-6 days
May	1-3 days							
June								
July	4-6 days			1-3 days				
August				7-9 days			1-3 days	
September	4-6 days							
October		1-3 days	4-6 days	7-9 days				1-3 days
November	4-6 days	1-3 days	10+ days		1-3 days	4-6 days		10+ days
December						1-3 days		1-3 days

Air Quality Advisories  
and/or  
Burn Bans for BVLD

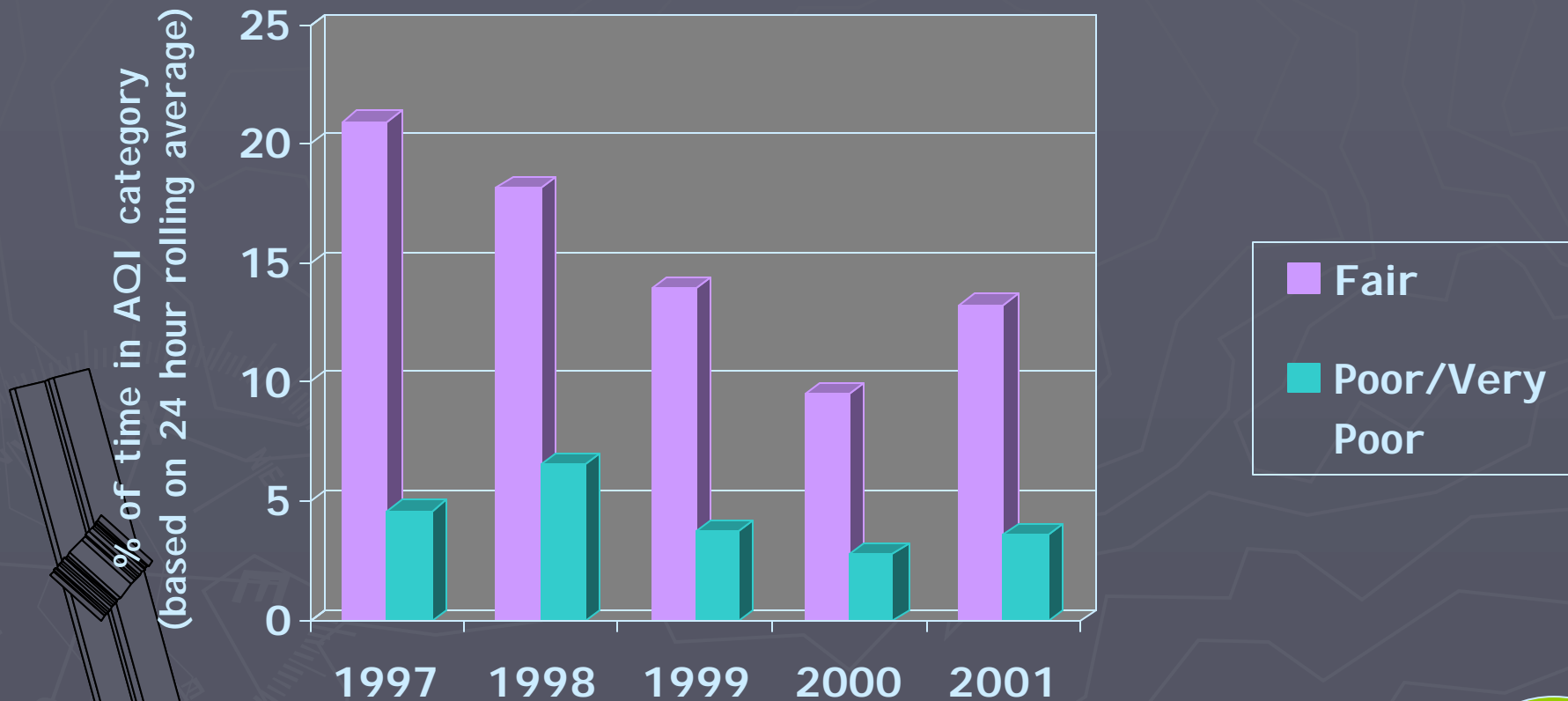


**Note:** # days includes day issued and day cancelled

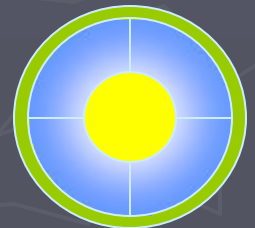


# Air Quality Index Categories

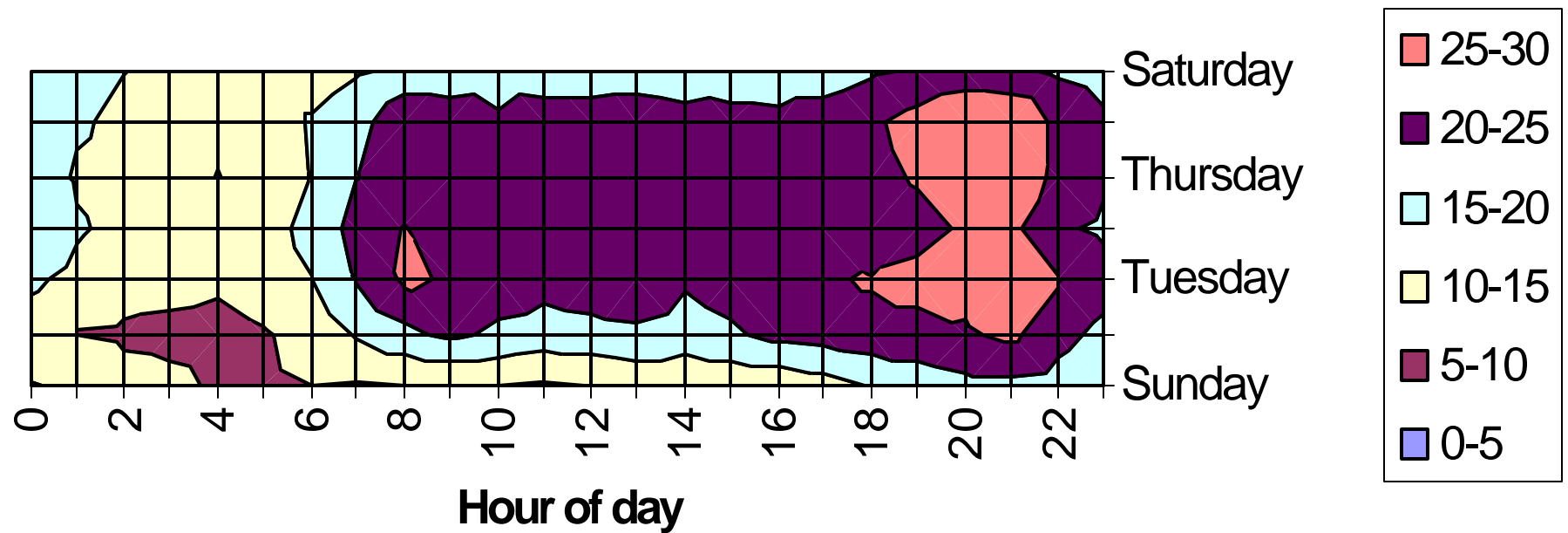
(Levelton Consultants Ltd. 2002)



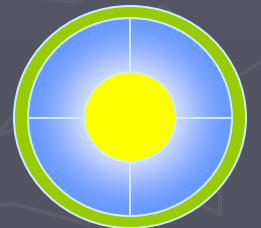
**Note:** -1997 data covers March 8 onwards  
- 2001 covers only to Dec 1



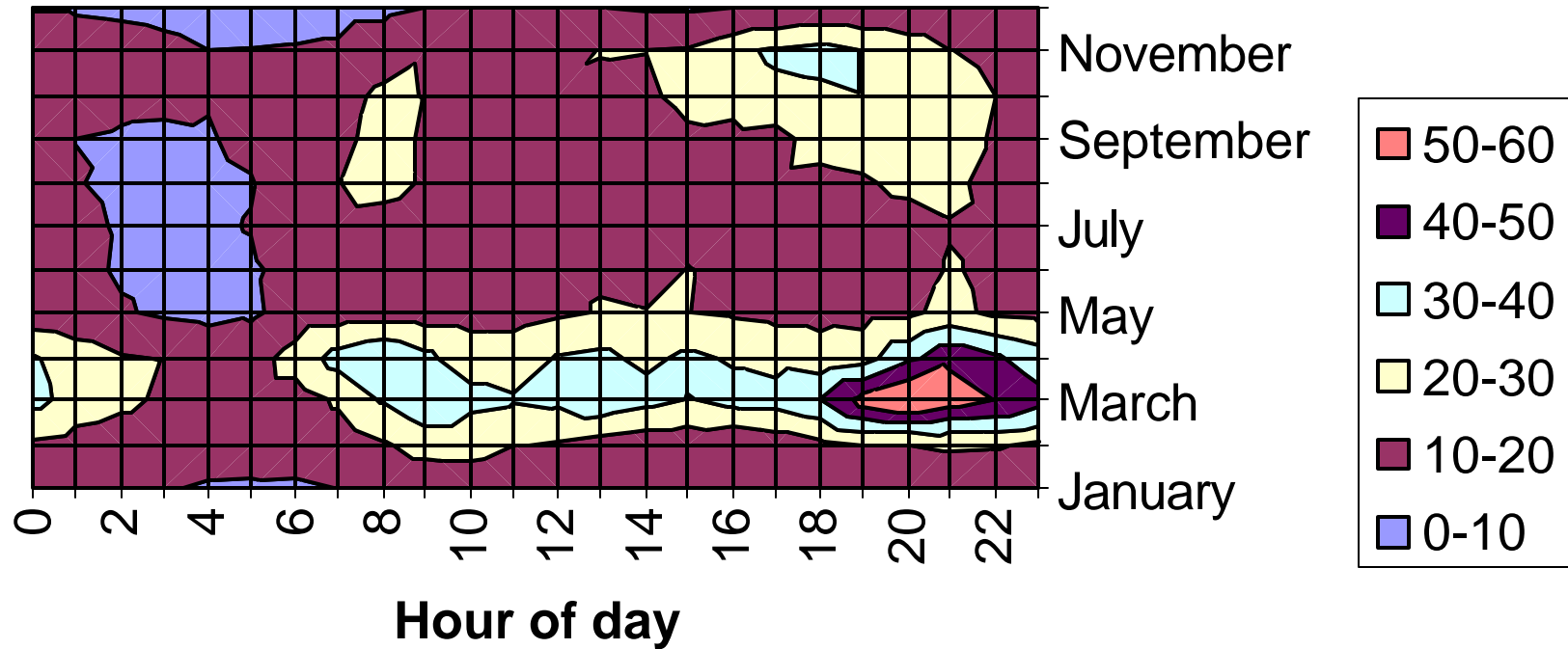
# Hour of Day and Day of Week



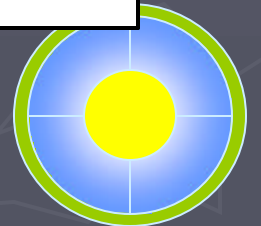
(Levelton Consultants Ltd. 2002)



# Hour of Day and Month of Year

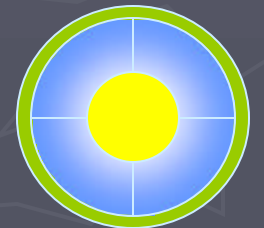
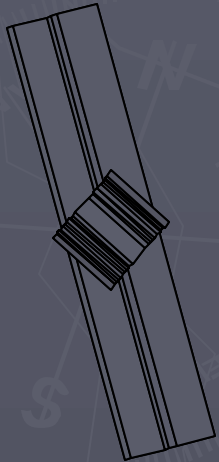
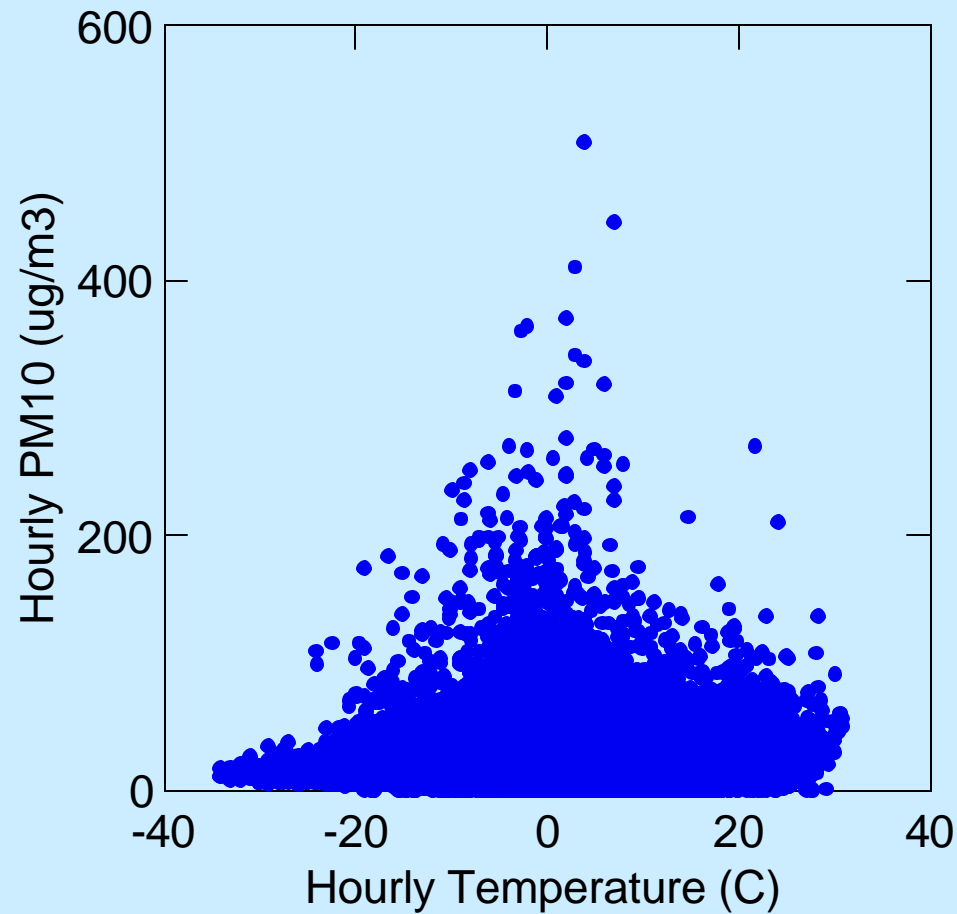


(Levelton Consultants Ltd. 2002)



# Hourly PM10 vs. Hourly Temperature

(Levelton  
Consultants  
Ltd. 2002)



# Summary

? BVLD airshed ranked 16<sup>th</sup> in BC based on PM10 levels

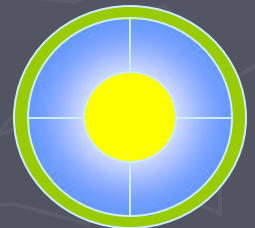
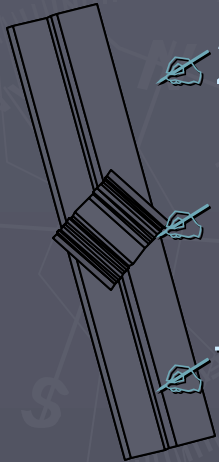
? Burns Lake

✍️ 1997-2000 general trend of lower % time in Fair AQI category but up and down over same period for Poor/Very Poor - **WHY???**

✍️ 2001 showed increase from 2000 for both % time in Fair and Poor/Very Poor AQI categories - **WHY???**

✍️ Hour of day, day of week and month of year all influence PM10 levels

✍️ Temperature influences PM10 levels



# Future Work

- ? Relation between wind speed, wind direction (and other meteorological parameters) and PM levels
- ? PM2.5 monitoring
- ? Relation between source emissions and ambient PM levels
- ? Etc etc etc...

