A Comparison of Local and National Air Toxics Emissions Estimates: Regional Importance of Selected Source Categories

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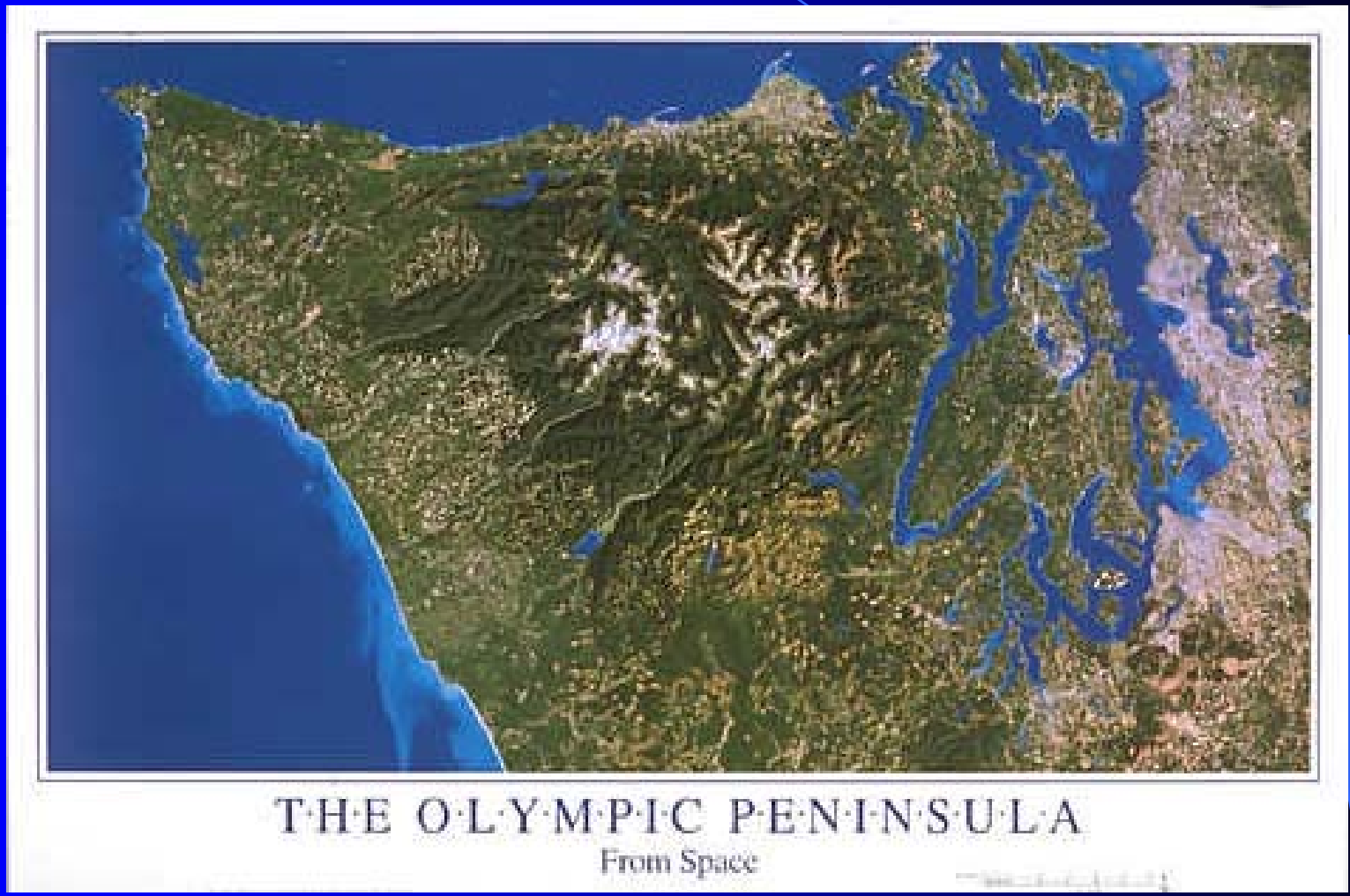
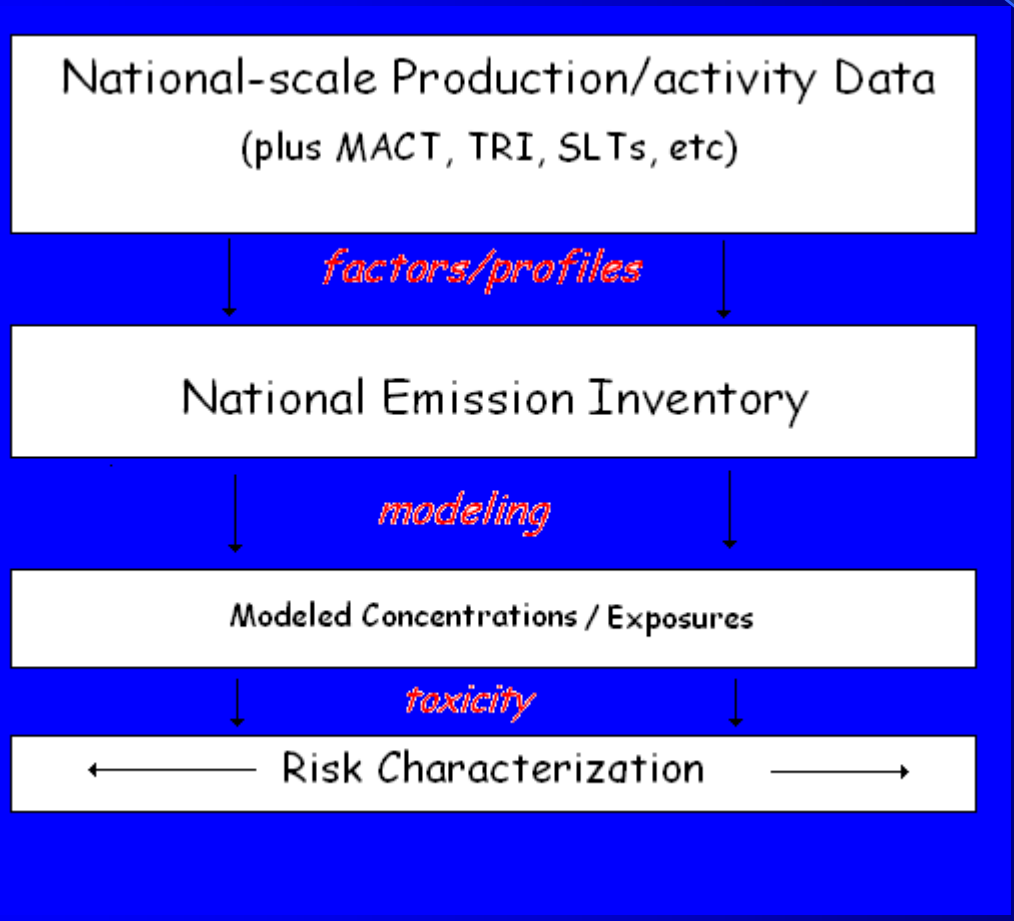


Olympic Region Clean Air Agency's Jurisdiction

Inventory Methods (Slide 1)

- Top Down –
  - Indirectly estimate County-level emissions by scaling down from national estimates
    - Population based – use Census data
    - Employment data – Bureau of Labor Statistics
    - Revenue-based – Dun & Bradstreet. Industry Associations, etc.
    - Less work than bottom-up, but less precise

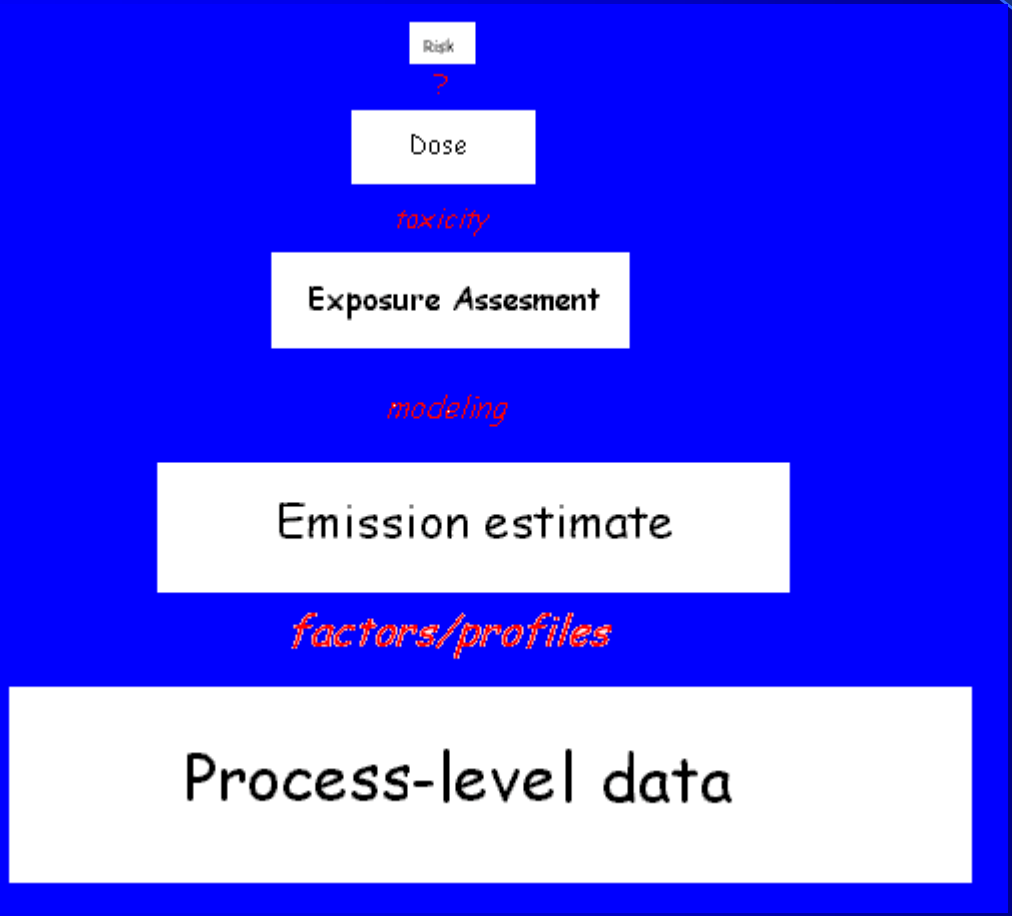
Inventory Methods (Slide 2)



Inventory Methods (Slide 3)

- Bottom-up
  - Calculate source-level emissions by directly surveying sources or measuring emissions
    - Material balance
    - Stack testing
    - Resource intensive

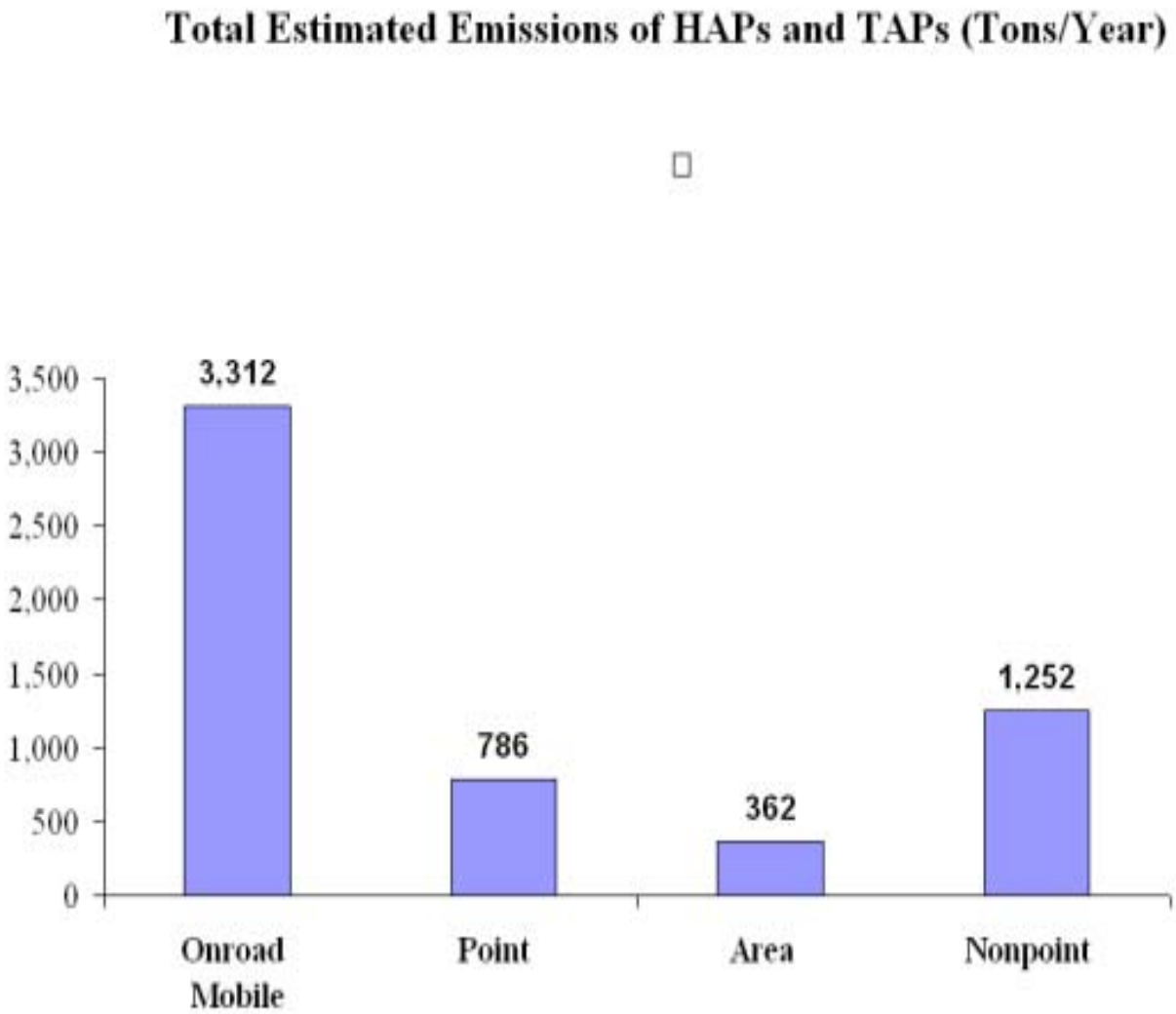
Inventory Methods (Slide 4)



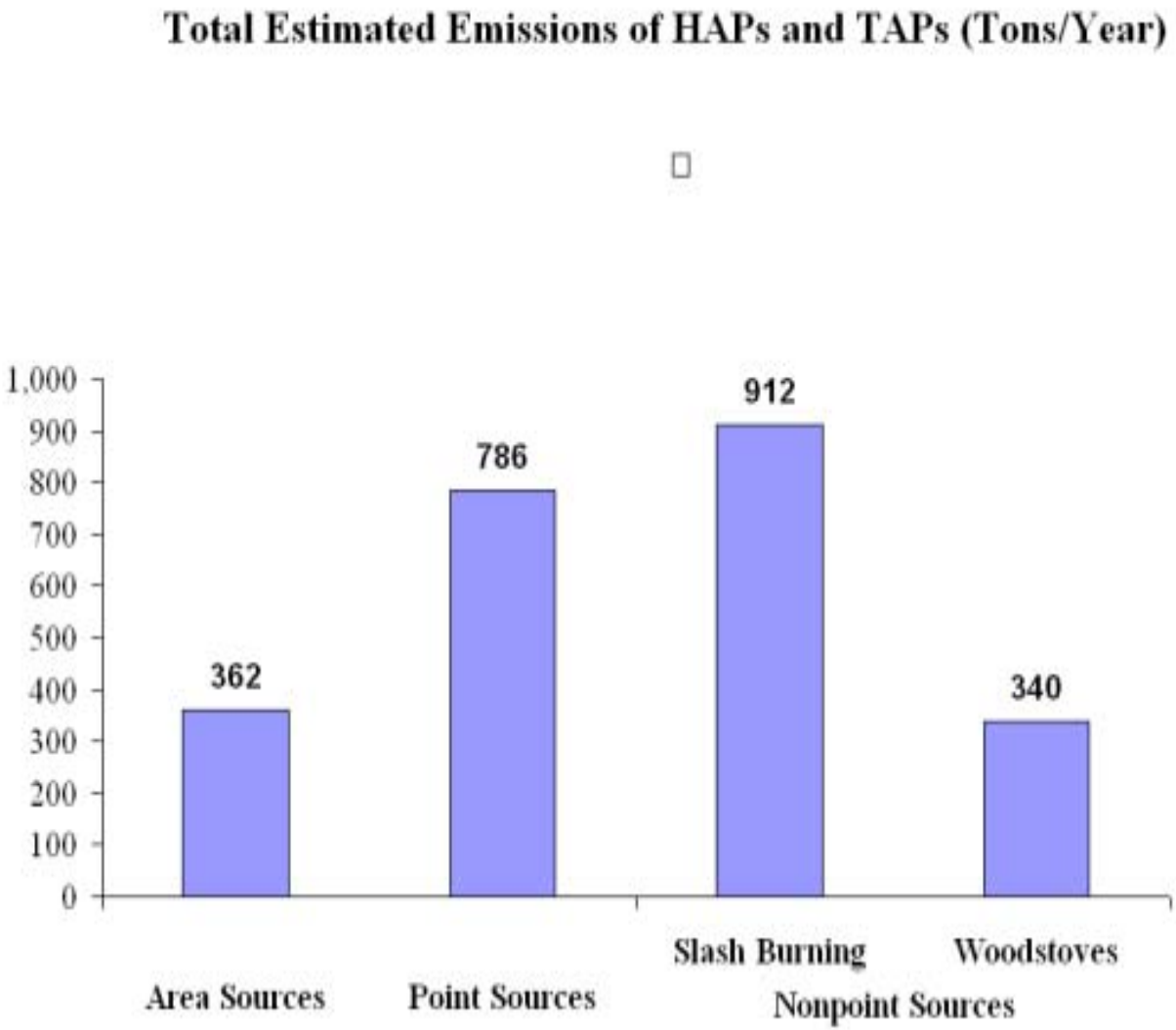
ORCAA Inventory Source Categories

- Area Sources
  - ORCAA registered sources
  - Non-registered sources (optional)
- Onroad Mobile Sources
- Point Sources
  - ORCAA Title V sources
  - Other significant ORCAA registered sources
  - Chemical Pulp Mills (WSDOE)
- Non-point sources
  - Woodstoves
  - Logging debris (slash) burning

Inventory Overview (1)



Inventory Overview (2)



Point Source HAP Emissions by Category

Point Source Air Toxics Emissions Calendar Year 2000 (Tons/Yr)

Source Category	Emissions (tons/yr)
Fiberglass Products	302
Wood Products	112
Pulp and Paper Products	154*
Surface Coating (various types)	111
Total	786

* Source-reported chemical pulp mill emissions account for 59 tons of this amount

Chemical Pulp Mill # 1

HAP estimates (tons/yr) for Chemical Pulp Mill #1

Pollutant	1999 NEI Version 2.0 (1996 NTI Data)	Source-Reported Total (Year 2000 Data)
1,2,4-Trichlorobenzene	1.06	
Acetaldehyde		3.71
Acetone		5.86
Acrolein	0.09	
Benzene	0.15	
Carbon Disulfide	0.11	
Carbon Tetrachloride	11.11	
Chlorine		1.16
Chlorine dioxide		0.27
Chloroform	9.92	
Cumene	0.19	
Ethyl Benzene	0.32	
Ethylene Dichloride	1.96	
Formaldehyde		0.27
Hydrochloric Acid	10.03	
Manganese		0.17
Manganese compounds		0.10
Methanol		36.29
Methylene Chloride	17.61	
Methyl ethyl ketone		3.78
o-Cresol	0.17	
o-Xylene	0.32	
Phenol	0.21	
Propionaldehyde	0.09	
Sulfuric acid		7.70
Tetrachloroethylene	2.47	
Trichloroethylene	1.96	
Xylenes (Mixture of o, m, and p Isomers)	0.17	
Total (tons)	57.94	59.30

Chemical Pulp Mill #2

HAP estimates (tons/yr) for Chemical Pulp Mill #2

Pollutant	1999 NEI Version 2.0 (1996 NTI Data)	Source-Reported Total (Year 2000 Data)
1,2,4-Trichlorobenzene	11.3	nd
Acetaldehyde	26.2	nd
Acrolein	0.9	nd
Benzene	0.1	nd
Carbon Disulfide	4.7	nd
Carbon Tetrachloride	6.7	nd
Chloroform	34.6	nd
Cumene	25.7	nd
Ethyl Benzene	15.5	nd
Ethylene Dichloride	0.6	nd
Formaldehyde	9.3	nd
Hydrochloric Acid	7.3	nd
Methanol	445.6	nd
Methyl Chloride	0.0	nd
Methyl Ethyl Ketone	14.1	nd
Methylene Chloride	0.6	nd
o-Cresol	33.6	nd
o-Xylene	7.5	nd
Phenol	9.4	nd
Propionaldehyde	6.3	nd
Tetrachloroethylene	1.3	nd
Trichloroethylene	1.3	nd
Xylenes (Mixture of o, m, and p Isomers)	4.2	nd
Total (tons)	667.0	nd

nd - no data available

Residential Wood Combustion

RWC HAP emissions (Total of all counties, tons/yr)

Pollutant	ORCAA Total	NEI Version 2.0
Acenaphthene	0.68	0.15
Acenaphthylene	11.96	3.01
Anthracene	0.89	0.20
Benz[a]Anthracene	1.20	0.29
Benzene	181.42	44.49
Benzo[a]Pyrene	0.31	0.06
Benzo[b]Fluoranthene	0.39	0.17
Benzo[e]Pyrene	0.68	0.00
Benzo[g,h,i,]Perylene	0.46	0.07
Benzo[k]Fluoranthene	0.12	0.06
Biphenyl	0.26	0.01
Chrysene	0.81	0.18
Dibenzo[a,h]Anthracene	0.06	0.00
Fluoranthene	1.22	0.29
Fluorene	1.51	0.35
Indeno[1,2,3-c,d]Pyrene	0.26	0.02
Methyl Ethyl Ketone	25.26	6.57
Naphthalene	17.99	4.17
o-Xylene	19.31	4.66
Perylene	0.02	0.00
Phenanthrene	5.79	1.17
Pyrene	1.42	0.34
Toluene	67.96	16.74
Total (tons)	340.4	83.0

Logging Debris (Slash) Burning

HAP Emissions From Slash Burning (ORCAA data, sum of all counties).

Pollutant	Total (tons/yr)
1,3-Butadiene	15.79
Acetaldehyde	31.38
Acrolein	29.03
Benzene	43.89
Carbonyl Sulfide	14.39
Formaldehyde	99.63
Hexane	1.26
Methyl Chloride	614.49
Polycyclic Organic Matter	0.43
Toluene	43.59
Xylenes	18.53
Total	912.41 tons/yr

Recommendations

- Improve interagency cooperation.
- Evaluate significance/validity of RWC results (from both ends?).
- Track slash burning emissions regularly.
- Develop emissions estimates for pulp mills.
- Pursue risk assessment work.