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Air Pollutant Emissions Inventories

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Overview

- Air Pollutants (AP) emissions inventories are what used to be called Criteria Air Contaminant emissions inventories. These inventories focus mainly on the smog precursors and other pollutants of interest:
 - **Criteria Air Contaminants (CAC):** Total Particulate Matter (TPM), Particulate Matter less than or equal to 10 Microns (PM10), Particulate Matter less than or equal to 2.5 Microns (PM2.5), Sulphur Oxides (SO_x), Nitrogen Oxides (NO_x), Volatile Organic Compounds (VOC), Carbon Monoxide (CO) and Ammonia (NH₃).
 - **Heavy Metals (HM):** Lead (Pb), Cadmium (Cd), and Mercury (Hg).
 - **Persistent Organic Pollutants (POPs):** Dioxins and Furans (DF), Benzo(a)pyrene(B(a)P), Benzo(b)fluoranthene (B(b)F), Benzo(k)fluoranthene (B(k)F), indeno(1,2,3-cd)pyrene (i(1,2,3-cd)p), and Hexachlorobenzene (HCB).



Emissions Inventories

- AP emissions inventories are carried out to:
 - Support domestic policy development from federal to regional levels
 - Track progress in meeting reductions
 - Perform air quality modelling and air quality forecasting
 - PM2.5, SO_x, NO_x, VOC, and NH₃ are the main smog precursor contaminants



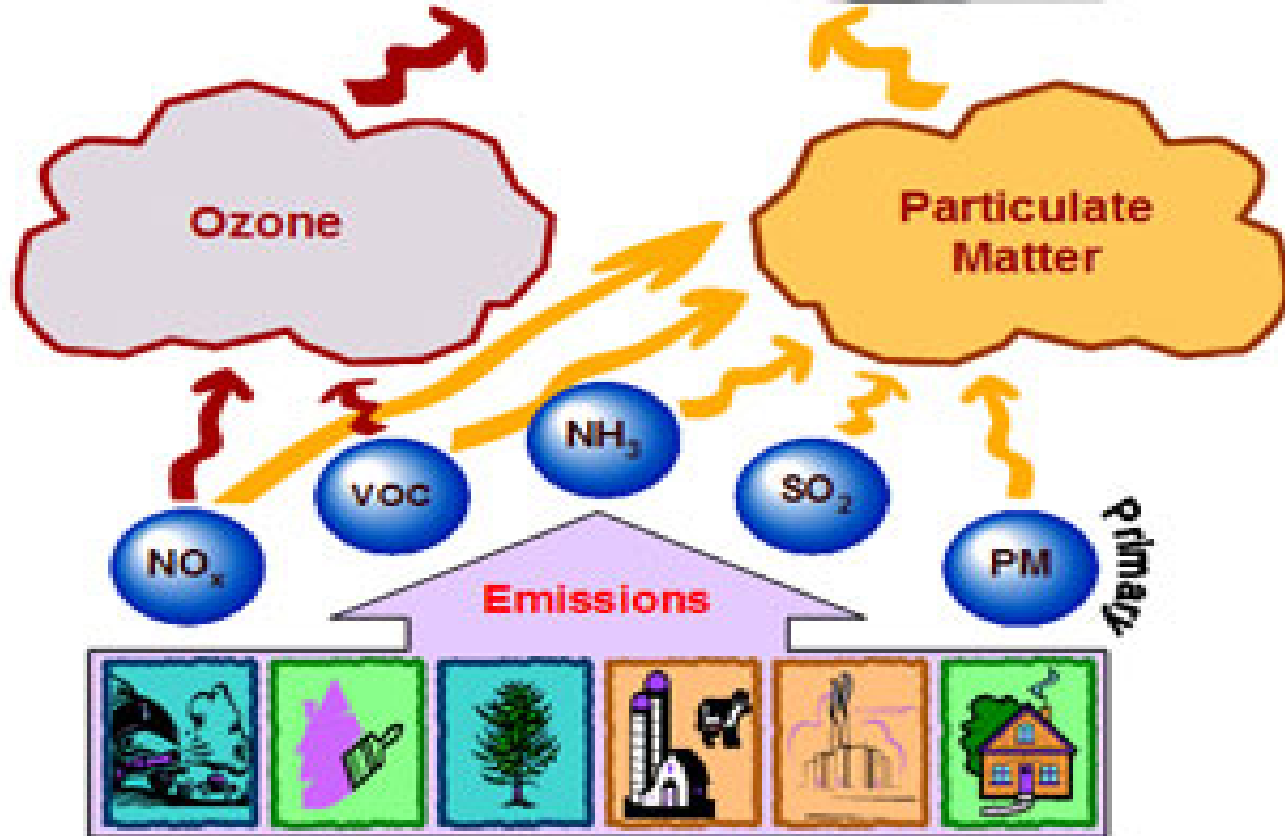
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Smog



by H. Miller

Emissions Inventories (cont'd)

- AP emissions inventories are carried out to:
 - Support international negotiations for emissions reductions with the United States and around the globe
 - Report domestically and internationally to support emissions reduction agreements, and
 - Public information



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AP Emissions Inventories

- Developed in collaboratively with the federal / provincial / territorial governments and some jurisdictions
- The AP emissions inventories are comprehensive in that they account for all Anthropogenic emissions sources and some natural. Comprised of Point, Area and Mobile Sources
 - **Point sources** are obtained through the NPRI as well as additional information provided by provinces
 - **Area sources** are diffuse sources such as residential wood combustion and are also estimated & reconciled with point sources to ensure all sources captured.
 - **Mobile sources** are all of the on and off road sources such as plane, trains, automobiles, as well as off road equipment both industrial, commercial & residential.



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AP Emissions Inventory Development

- Inventories account for all industrial, commercial, residential and some natural sources
- Emissions inventories are generally developed at the provincial level as statistical information available for the provinces (e.g. fuel sales, livestock, etc...)
- Reconciled with point sources to ensure no double counting of emissions by source sector
- Models are often used to estimate emissions, such as for the on-road transportation and agricultural ammonia
- Geographical information systems are used to spatially allocated the emissions to various grids & administrative boundaries (e.g. counties, municipalities, etc...)



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AP Emissions Inventories

- The emissions inventories are now published annually and are available on Environment Canada's National Pollutant Release Inventories website:
 - www.ec.gc.ca/npri/ap (Link should be active shortly)
- Annual emissions provincially and nationally for 2005 and 2006. 2007 emissions to be published in April
- National AP emissions available from 1985 to 2005
- Graphical web mapping of emissions to be available end of June 2009



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Inventory Categories

- The Emissions Inventory Categories are:
 - Industrial sources
 - Non-Industrial Fuel Combustion sources
 - Transportation
 - Incineration sources
 - Miscellaneous sources
 - Open Sources
 - Natural Sources
- Within each of the categories there are many sectors derived from SIC & NAISC codes, regulatory or other emissions reductions initiatives, or of interest
- See the Ontario 2006 emissions inventory sheet for more information



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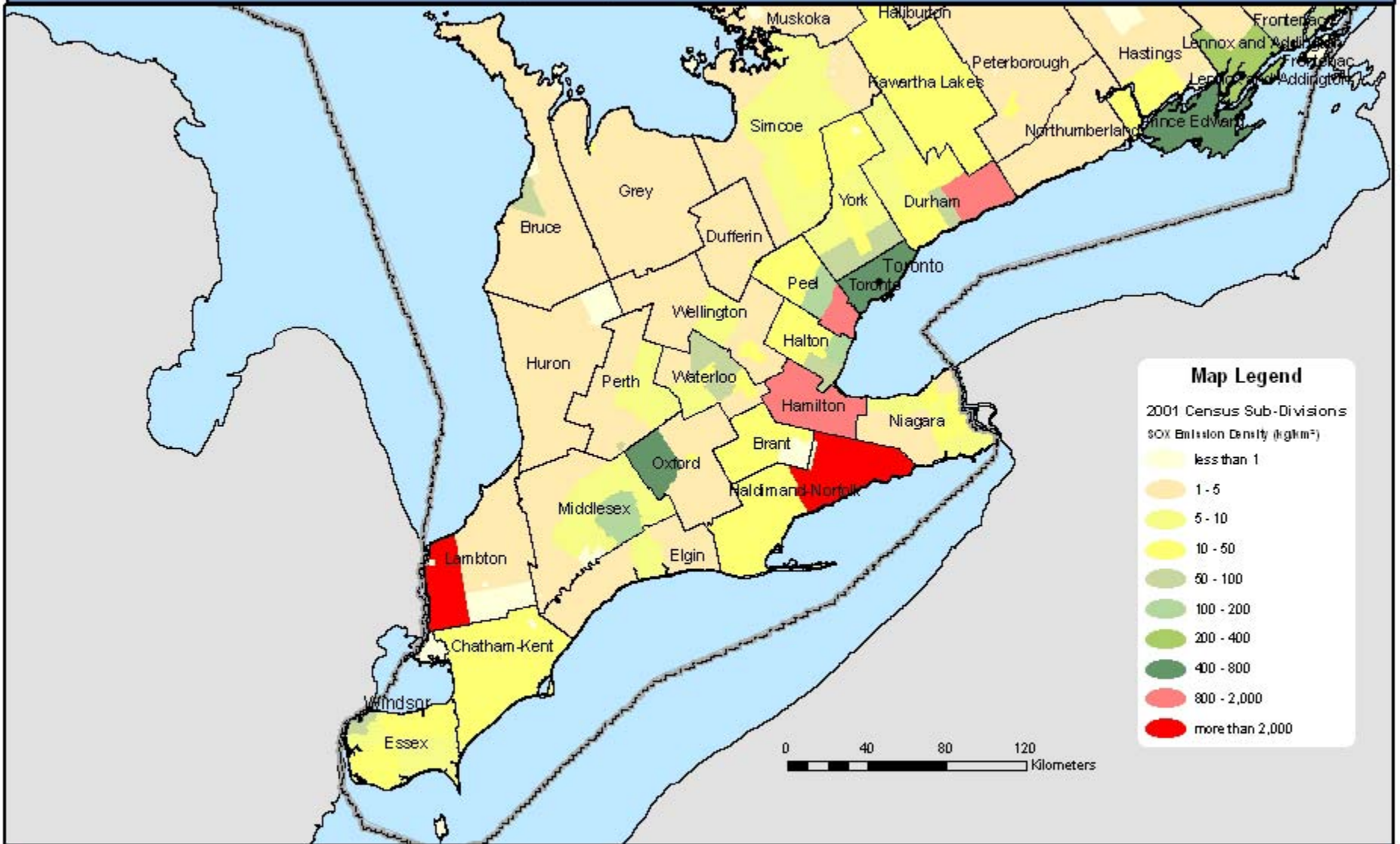
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County Emissions Summary (Excluding Open Sources)

	PM25	SOx	NOx	VOC	CO	NH3
Bruce County	501	814	1,323	2,026	6,428	681
Chatham-Kent Division	830	341	3,174	4,876	13,632	1,229
Elgin County	651	298	4,179	4,949	26,050	838
Essex County	2,699	1,633	19,172	23,580	125,520	1,344
Grey County	772	502	4,128	3,104	11,917	428
Haldimand-Norfolk Regional Municipality	2,225	78,238	34,627	5,908	50,539	963
Lambton County	2,892	80,345	22,324	10,341	41,345	1,744
Middlesex County	2,308	1,274	10,889	13,714	60,999	1,386
Oxford County	1,617	8,011	9,973	6,148	27,966	1,007
Perth County	670	799	6,164	3,189	16,330	996
Waterloo Regional Municipality	2,488	2,296	10,643	17,343	58,931	534
Wellington County	1,254	579	7,105	7,688	44,492	1,002
Sum of above County Emissions	18,906	175,130	133,702	102,868	484,148	12,152
Ontario Total	82,537	512,111	514,970	476,595	2,504,507	29,747
Percentage of ON Emissions	23%	34%	26%	22%	19%	41%



SULPHUR OXIDES (SO_x) EMISSIONS IN CANADA FOR 2005



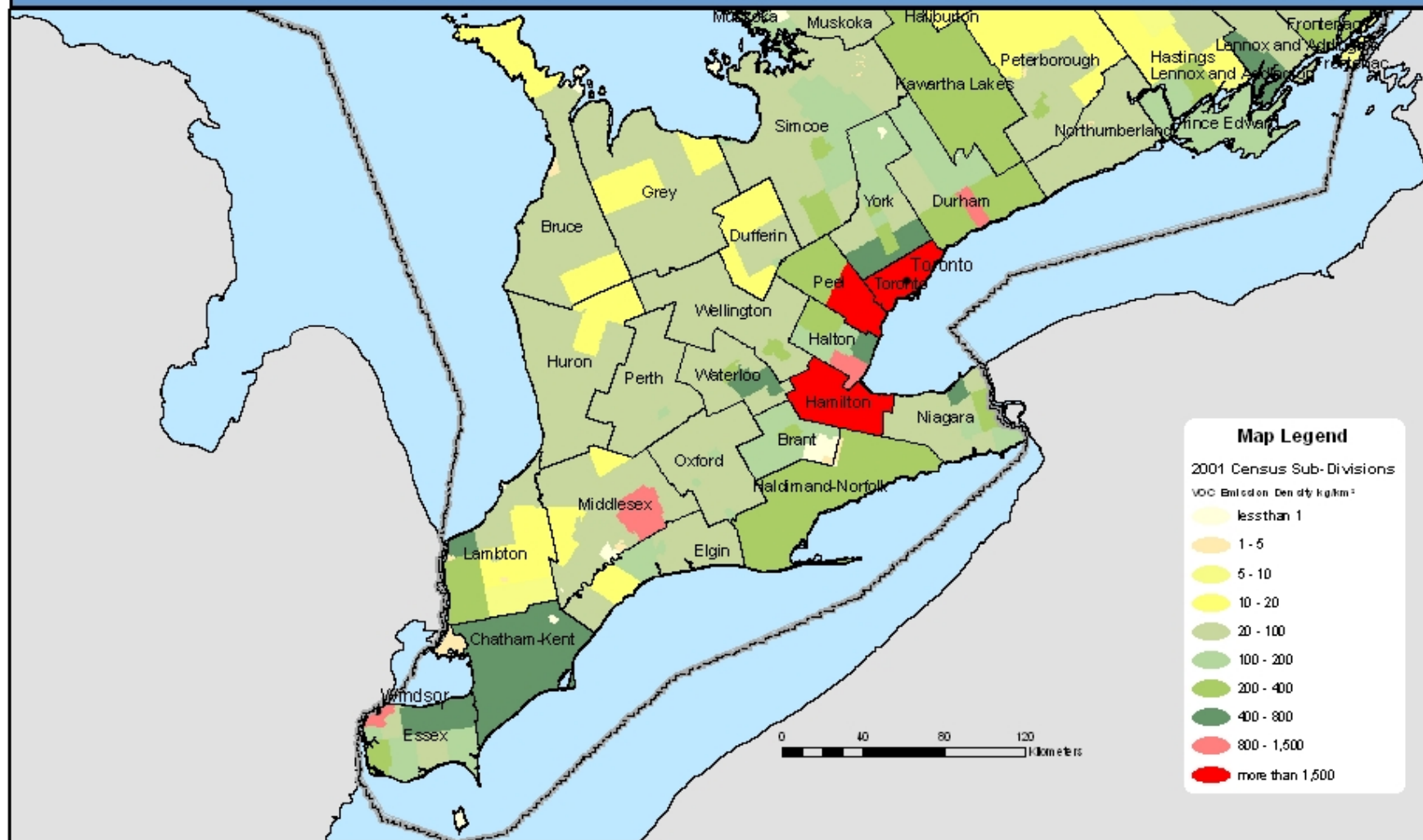
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POLLUTION DATA BRANCH
2005 Criteria Air Contaminant (CAQ) Inventory April 2007

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VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS IN CANADA FOR 2005



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POLLUTION DATA BRANCH
2005 Criteria Air Contaminant (CAQ) Inventory April 2007

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Haldimand-Norfolk Regional Municipality

	PM25	SOX	NOX	VOC	CO	NH3
Industrial	964	9,966	4,800	1,113	8,263	22
Non Industrial Fuel Comb.	1,009	68,066	24,746	622	9,264	10
Transportation	213	201	5,080	2,390	32,994	149
Incineration	0	5	0	21	7	4
Miscellaneous	39	0	0	1,762	12	778
TOTAL	2,225	78,238	34,627	5,908	50,539	963

- SOx and NOx emissions are predominantly from the Non-Industrial Fuel Combustion Sources, mainly Electricity Generation
- Transportation is the largest source of CO



Lambton County

	PM25	SOX	NOX	VOC	CO	NH3
Industrial	1,566	50,694	9,739	6,054	15,645	558
Non Industrial Fuel Comb.	1,099	29,479	9,362	565	6,187	7
Transportation	177	163	3,221	1,687	19,486	60
Incineration	0	10	1	14	12	36
Miscellaneous	49	0	0	2,021	14	1,084
TOTAL	2,892	80,345	22,324	10,341	41,345	1,744

- The largest proportion of SOx and NOx emissions come from the Industrial Sources and Non-Industrial Fuel Combustion Sources
- Transportation accounts for almost 1/2 the CO emissions



Middlesex County (London)

	PM25	SOX	NOX	VOC	CO	NH3
Industrial	564	238	1,067	1,070	3,133	14
Non Industrial Fuel Comb.	1,071	512	1,105	1,445	7,074	20
Transportation	536	492	8,701	4,771	50,705	117
Incineration	1	33	2	7	42	2
Miscellaneous	137	0	13	6,421	45	1,233
TOTAL	2,308	1,274	10,889	13,714	60,999	1,386

- Emission levels are generally lower than the other 2 counties except Transportation which is higher
- Transportation dominates for NOx, VOC, and CO, and for SOx is proportionally similar to Industrial and Non-Industrial Fuel Combustion



Questions / contact

- For questions, comments, clarifications, or additional information please contact:

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