



Measuring solid waste: Statistics Canada's surveys and results

Presentation given to the SWRC
September 18, 2008

Agenda

- The StatCan surveys
- Measurement challenges
- Disposal data
- Diversion – recycling and composting

Our environmental surveys



- Survey of Environmental Protection Expenditures
- Survey of Environmental Goods and Services
- Industrial Water Survey
- Agricultural Water Use Survey
- Survey of Source Water Treatment Plants
- Survey of Industrial Processes
- Households and the Environment Survey
- Waste Management Industry Surveys

The waste management surveys

- What we want to find out:
 - Financial information
 - Quantities of waste (hazardous and non-hazardous):
 - Disposal, recycling, exports, imports
 - Per capita disposal rates tracked
 - What we use - two surveys:
 - Business sector : 1994, 1995, 1996, 1998, 2000, 2002, 2004, 2006
 - Government sector: 1993, 1994, 1996, 1998, 2000, 2002, 2004, 2006
- We also use the Households and the Environment Survey for qualitative information

Government Sector

- Sent to public bodies that have waste management programs, including:
 - local governments
 - waste management boards and commissions
 - provincial waste programs

- The survey frame is developed using the following criteria:
 - population... threshold varies according to province / territory
 - if a municipality has a waste disposal or material recycling facility within its borders
 - 2006: N = 750

Business Sector

- Sent to waste management firms, including those that:
 - collect solid waste and recyclables
 - operate solid non-hazardous and hazardous waste disposal facilities as well as recycling and composting facilities

- The survey universe is derived from the Statistics Canada's Business Register

- The survey frame was developed using:
 - revenue and employment levels that vary according to the province/territory of operation
 - 2006: N = 570

Survey Response Rates

- Based on the number of respondents:

	1998	2000	2002	2004	2006
• Business sector:	75%	74%	75%	83%	83%
• Government Sector:	90%	83%	91%	92%	88%

- High response rates due to

- the extensive collection/processing infrastructure that exists at Statistics Canada
- mandatory nature of the surveys



Measurement Challenges

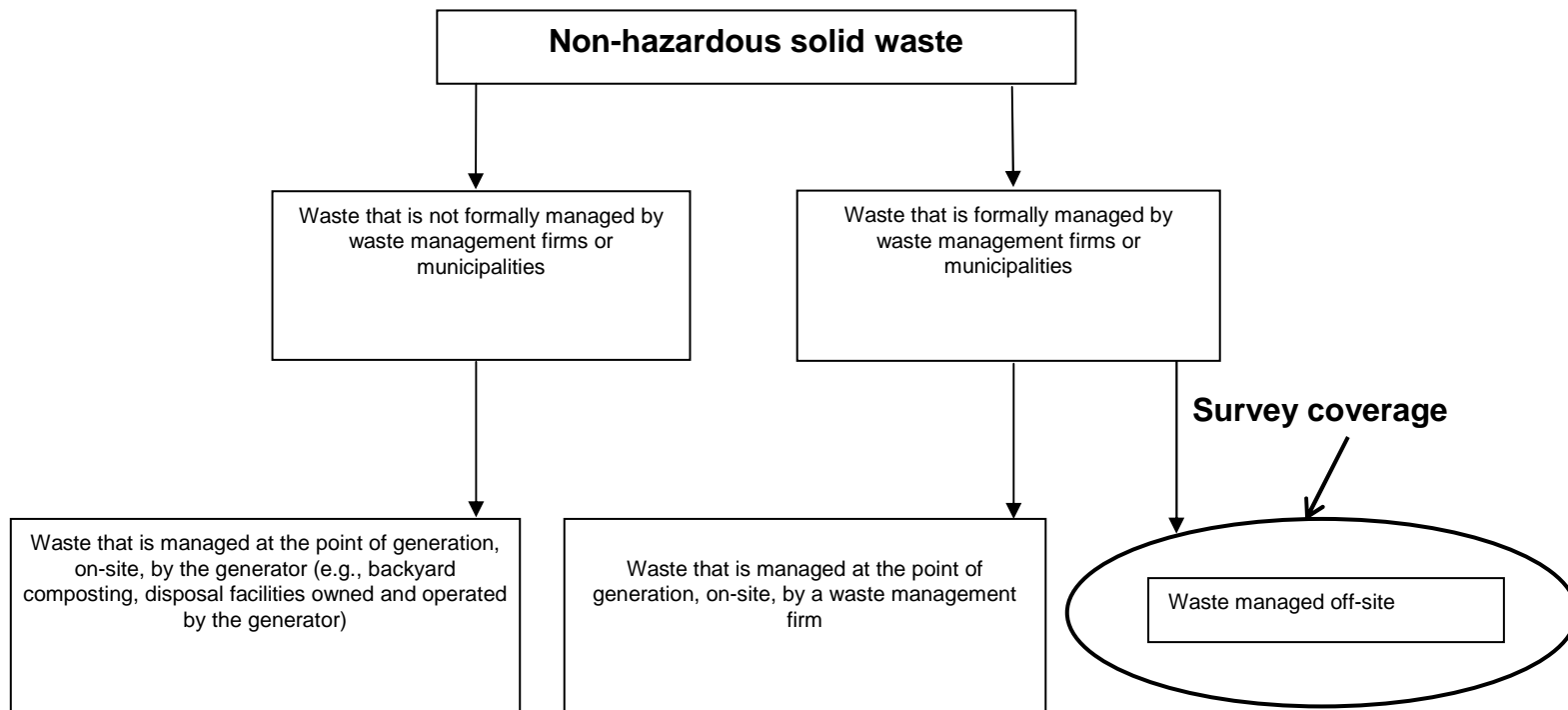
Or, why I am completely bald

Measurement challenges

- Differences in concepts and definitions across Canada
 - The manuals and methodologies developed by the GAP working group have solved some of these problems
- Difficulties in identifying the sources of wastes and recyclables (Residential, IC&I, C&D)
 - Improving as tracking technologies improve
 - Large private firms much better at tracking
- Lack of weigh scales at the gates of facilities
 - A problem in Saskatchewan and Manitoba
 - Yet, the bulk of waste ends up in a few large facilities
 - Conversion factors (e.g., cubic yards to tonnes) based on GAP

Biggest challenge - coverage

Waste Management Industry Survey Coverage



Source:
Statistics Canada, Environment Accounts and Statistics Division

Biggest challenge – coverage of diversion data

- recycling figures include **only** materials that were processed at publicly or privately owned material recycling facilities
- data **do not include** materials that were processed and reused by a business or public body on site as part of its production process or as part of a secondary economic activity
 - those materials never entered the non-hazardous waste stream and therefore are not considered to be waste for the purposes of this survey
- some materials collected under stewardship or take it back programs of **may be included**
 - if the firms involved in the collection and/or processing of these materials fall under the waste management industry as defined by NAICS or,
 - if a municipality involved in the collection of materials or administration of a program has reported these materials on their survey
- some deposit-return materials, such as beer bottles, are considered to be “reuse” and are not included in these tables **unless they have been processed at a material recovery facility**

Biggest challenge – coverage of diversion data

- data do not include all materials managed by wholesalers of scrap metal, plastics or paper
 - But we are currently working on closing this gap through changes to the 2012 version of the North American Industrial Classification System (NAICS)
- data cover only those firms whose primary source of income accrues from waste management activities and those public bodies that provide waste management services
- used clothing that is donated to a retailer and resold is excluded, as are used appliances that are refurbished and resold

Biggest challenge - coverage

- agricultural sector is largely excluded
 - waste and recyclable materials (e.g., dead livestock, manure) from farms are generally managed on-site by the producer or managed by firms who specialize in the management of agricultural waste
- contaminated soil that is used as landfill cover or some other beneficial purpose at a disposal facility (e.g. the building of berms) is collected but excluded from estimates
- other high tonnage excluded materials: asphalt from road-works, debris from land clearing operations (e.g. soil, brush, stumps)

Biggest challenge - coverage

- Included in survey frames
 - composting data include tonnages managed through centralized programs that are owned and operated by municipalities or boards or the private sector
- Compost data exclude
 - on-site composting of industrial organic wastes,
 - for example, those firms engaged in the composting of wastes from primary resource extraction like forestry may be excluded if their main business activity does not fall under the waste management industry as defined by NAICS
 - on-site composting programs such as backyard composting or operations run by food retailers or restaurants

Coverage - summary

- We like to measure diversion and talk about diversion rates,
 - Ontario has been doing this since 1988
 - If memory serves me correctly
- BUT, maybe we should be viewing the measurement in another way since diversion is difficult to measure
 - Especially for non-residential generators
- Kilograms per capita (kg/cap) disposed is simpler
 - AND, more accurate

Disposal data



- Unlike diversion numbers, we are certain of the completeness of our coverage
 - all landfills and incinerators accepting significant quantities of waste are included
 - “Significant” means that very small operations are not surveyed
 - Under 500 tonnes / year in most cases
 - though even some of these are captured in smaller provinces

Disposal data

- More consistent across the country
 - Disposal is disposal (sort of)
- Though there are still some materials that fall into a grey zone for some jurisdictions
 - e.g., contaminated soil, land-clearing debris and bottom ash from sewage sludge incineration is excluded.
- BUT - new technologies are presenting new measurement issues – when is disposal NOT disposal?
 - e.g., gasification, EFW

Disposal data

- Kilograms per capita – benchmark measure that StatCan has adopted
 - And we are considering an alternative measure such as disposal per capita per \$1000 of GDP
- Diversion rates will not be published after 2006 data report release

Kg / cap

- Controls for population changes
- Consistent material types
- Undercoverage – we can't get everyone!
 - Service areas populations are calculated using Census data and raw numbers are “blown-up” to account for undercoverage
 - Undercoverage in Saskatchewan: approx. 5% - or around 50 thousand people (based on 2006 Census estimates)

Kg / cap

- Alberta has target of 500 kg / cap by 2010
 - Currently 1,133 (StatCan 2006)
- Nova Scotia has set a target of 300 kg cap for both residential and non-residential waste disposed
 - Currently 430 (StatCan 2006)



Disposal

Disposal of waste - by province and territory

	Total waste disposed			Waste disposed per capita		
	2004 ^f	2006	Change 2004 to 2006 percent	2004 ^f	2006	Change 2004 to 2006 percent
Newfoundland and Labrador	400,048	407,728	1.9%	773	800	3.4%
Prince Edward Island	x	x	-12.6%	x	x	-12.7%
Nova Scotia	399,967	401,670	0.4%	426	430	0.7%
New Brunswick	442,173	450,238	1.8%	588	601	2.2%
Quebec ¹	6,454,000	6,808,440	5.5%	855	890	4.1%
Ontario	9,809,264	10,437,780	6.4%	790	822	4.0%
Manitoba	928,117	1,024,272	10.4%	793	869	9.6%
Saskatchewan	794,933	833,753	4.9%	799	844	5.7%
Alberta	3,077,311	3,819,872	24.1%	959	1,133	18.1%
British Columbia	2,767,657	2,917,080	5.4%	658	675	2.6%
Yukon Territory	20,800	25,245	21.4%	674	809	20.1%
Northwest Territories	41,978	42,884	2.2%	980	1,011	3.2%
Nunavut	x	x	5.0%	x	x	2.3%
Canada	25,226,765	27,249,178	8.0%	788	835	5.9%

Notes :

Figures may not add up to totals due to rounding.

x Suppressed to meet the confidentiality requirement of the *Statistics Act*.

1. The 2004 waste disposal data are derived from a survey administered by RECYC-QUÉBEC. In 2006, disposal data were derived from Statistics Canada's 2006 Waste Management Industry Survey.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Waste disposal – where is it coming from?

5% overall.
Canada – 8%
Alberta – 24%

Disposal of Waste by Source and by Province and Territory, 2004 and 2006

Province/Territory	Residential sources		Industrial, commercial and institutional sources		Construction and demolition sources		Total waste disposed	
	2004 ^f	2006	2004 ^f	2006	2004 ^f	2006	2004 ^f	2006
	tonnes							
Newfoundland and Labrador	228,004	227,618	149,653	149,673	22,391	30,437	400,048	407,728
Prince Edward Island	28,894	29,495	51,996	42,040	3,348	2,085	84,238	73,621
Nova Scotia	179,262	169,337	174,053	165,488	46,651	66,845	399,967	401,670
New Brunswick	208,120	216,357	174,997	158,056	59,056	75,825	442,173	450,238
Quebec	2,209,000	2,183,788	2,726,000	3,067,909	1,519,000	1,556,744	6,454,000	6,808,440
Ontario	3,489,917	3,705,235	5,460,539	5,889,370	858,808	843,175	9,809,264	10,437,780
Manitoba	450,658	455,304	397,756	484,565	79,703	84,403	928,117	1,024,272
Saskatchewan	279,420	296,062	438,038	452,528	77,475	85,163	794,933	833,753
Alberta	943,428	973,683	1,453,212	1,985,692	680,678	860,497	3,077,311	3,819,872
British Columbia	919,323	956,968	1,393,322	1,417,218	455,012	542,894	2,767,657	2,917,080
Yukon Territory	x	x	x	x	x	x	x	x
Northwest Territories	15,957	14,703	12,877	10,492	13,144	17,689	41,978	42,884
Nunavut	x	x	x	x	x	x	x	x
Canada	8,961,583	9,238,376	12,445,568	13,837,463	3,819,614	4,173,338	25,226,765	27,249,178

1% increase

2% increase

10% increase

But there is often some overlap between ICI and CRD

Backyard burning – not all waste is treated equally

Yard and household waste burning in yards, 2006

	Households that burned yard waste on their property	Households that burned household waste on their property
	percent	
Newfoundland and Labrador	11	5
Prince Edward Island	9	4
Nova Scotia	15	5
New Brunswick	14	5
Quebec	12	1
Ontario	8	3
Manitoba	14	9
Saskatchewan	11	10
Alberta	10	5
British Columbia	10	3
Canada	10	3

As a percentage of all households that are not in apartments.

Source: Statistics Canada, Households and the Environment Survey, 2006.

Diversion - totals

Diversion of waste - by province and territory

	Total materials diverted			Diverted materials per capita			Diversion rate	
	2004 ^f	2006	Change 2004 to 2006	2004	2006	Change 2004 to 2006	2004	2006
Newfoundland and Labrador	35,308	30,385	-13.9	68	60	-12.7	8.1	6.9
Prince Edward Island	x	x	3.2	x	x	3.1	34.0	37.8
Nova Scotia	239,845	275,983	15.1	256	295	15.4	37.5	40.7
New Brunswick	139,262	252,174	81.1	185	337	81.8	24.0	35.9
Quebec ¹	2,130,100	2,456,300	15.3	282	321	13.8	24.8	26.5
Ontario	2,414,552	2,396,856	-0.7	194	189	-3.0	19.8	18.7
Manitoba	157,490	152,799	-3.0	135	130	-3.6	14.5	13.0
Saskatchewan	114,182	106,868	-6.4	115	108	-5.7	12.6	11.4
Alberta	620,080	652,637	5.3	193	194	0.2	16.8	14.6
British Columbia	1,209,216	1,366,191	13.0	288	316	9.9	30.4	31.9
Yukon Territory, Northwest Territories and Nunavut	x	x	51.0	x	x	50.0	11.9	15.9
Canada	7,112,735	7,749,030	8.9	222	237	6.8	22.0	22.0

Notes:

Figures may not add up to totals due to rounding.

This information covers only those companies and local waste management organizations that reported non-hazardous recyclable material preparation activities and refers only to that material entering the waste stream and does not cover any waste that may be managed on-site by a company or household. Additionally, these data do not include those materials transported by the generator directly to secondary processors such as pulp and paper mills while bypassing entirely any firm or local government involved in waste management activities.

1. Waste diversion data are derived from a survey administered by RECYC-QUÉBEC.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Diversion – by type

Materials Prepared for Recycling, by Type and by Province and Territory, 2006

Types of Materials	Canada	Nfld.Lab.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.,
												N.W.T. and Nvt.
tonnes												
All materials	7,749,030	30,385	x	275,983	252,174	2,456,300	2,396,856	152,799	106,868	652,637	1,366,191	x
Newsprint	1,261,891	x	x	33,128	10,011	593,000	380,281	34,240	19,905	65,119	x	x
Cardboard and boxboard	1,471,315	x	x	31,373	9,808	462,540	474,211	44,442	16,925	121,886	280,131	x
Mixed paper	688,003	x	x	8,592	x	130,460	194,698	17,710	3,195	78,657	x	x
Glass	400,003	x	x	1,511	0	117,000	179,341	7,973	x	x	39,406	x
Ferrous metals	278,036	x	0	2,962	x	111,800	80,794	18,360	x	20,034	22,811	x
Copper and aluminum	51,225	x	0	x	x	10,000	21,290	3,227	x	x	x	x
Mixed Metals	148,231	x	x	x	x	18,500	22,343	3,779	2,065	14,745	81,595	x
White Goods	299,397	x	x	4,700	x	248,000	22,023	x	3,092	12,099	7,158	x
Electronics	11,357	0	0	0	x	3,000	4,251	x	x	2,631	x	0
Plastics	232,339	x	x	4,540	864	95,000	60,195	5,696	4,637	14,852	44,956	x
Tires	138,646	x	x	x	x	70,000	4,948	955	x	2,508	35,987	x
Construction, renovation and demolition	715,364	0	0	51,263	10,633	236,000	187,353	2,704	x	34,300	188,323	x
Organics	2,006,461	0	x	133,934	x	360,000	732,200	12,490	3,627	231,459	292,031	x
Other materials	46,763	x	0	1,808	323	1,000	32,927	353	x	6,099	1,575	x

Diversion – access and use

Households that had access to and used recycling programs, by selected Census Metropolitan Areas (CMAs), 2006

	Glass		Paper		Plastics		Metal cans		Any recyclable material ³	
	Access to program ¹	Used program ²	Access to program ¹	Used program ²	Access to program ¹	Used program ²	Access to program ¹	Used program ²	Access to any program ¹	Used any program ²
	percent									
Thunder Bay Ont.	82	83	89	89	84	84	84	83	93	90
Winnipeg Man.	90	87	93	90	90	89	89	89	94	91
Regina Sask.	86	90	84	81	82	91	77	86	91	97
Saskatoon Sask.	81	90	80	84	78	91	72	85	91	95
Calgary Alta.	80	89	76	87	70	86	72	84	85	95
Edmonton Alta.	88	96	85	94	83	95	82	91	92	98
Abbotsford B.C.	90	97	93	98	89	97	88	94	96	99
Vancouver B.C.	92	96	94	97	91	97	90	96	96	99
Victoria B.C.	96	98	98	98	96	98	95	98	99	99
All CMAs	89	95	90	95	88	95	87	94	93	97
	Difference from national number									
Regina Sask.	-3	-5	-6	-14	-6	-4	-10	-8	-2	0
Saskatoon Sask.	-8	1	-9	-11	-10	-4	-15	-9	-2	-2
Calgary Alta.	-9	0	-13	-8	-18	-3	-15	-10	-8	-2

Composting

Households that composted kitchen or yard waste, by selected Census Metropolitan Areas (CMAs), 2006

	Households that had a lawn and / or garden in 2005 and were not apartment dwellers	Households that composted ¹	Composted kitchen waste ²	Composted yard waste ³
		percent		
Halifax N.S.	97	68	67	69
Saint John N.B.	97	62	59	65
St. Catharines-Niagara Ont.	97	53	49	50
Victoria B.C.	94	40	31	52
Toronto Ont.	95	33	30	41
Thunder Bay Ont.	97	31	24	31
Hamilton Ont.	97	28	22	30
Ottawa-Gatineau	96	23	17	28
Vancouver B.C.	90	23	17	31
Saskatoon Sask.	92	22	20	27
Edmonton Alta.	93	21	16	26
Regina Sask.	94	20	17	23
Calgary Alta.	89	18	15	21
Winnipeg Man.	96	17	14	20
Montréal Que.	89	11	9	15
Québec Que.	95	8	4	14
All CMAs	93	25	21	30

Note:

1. As a percentage of all households.
 2. As a percentage of households that reported they composted in 2006.
 3. As a percentage of households that reported they composted in 2006 and were not apartment dwellers and that had a lawn or garden in 2005.
- The CMAs are based on the 2001 Census delineation.

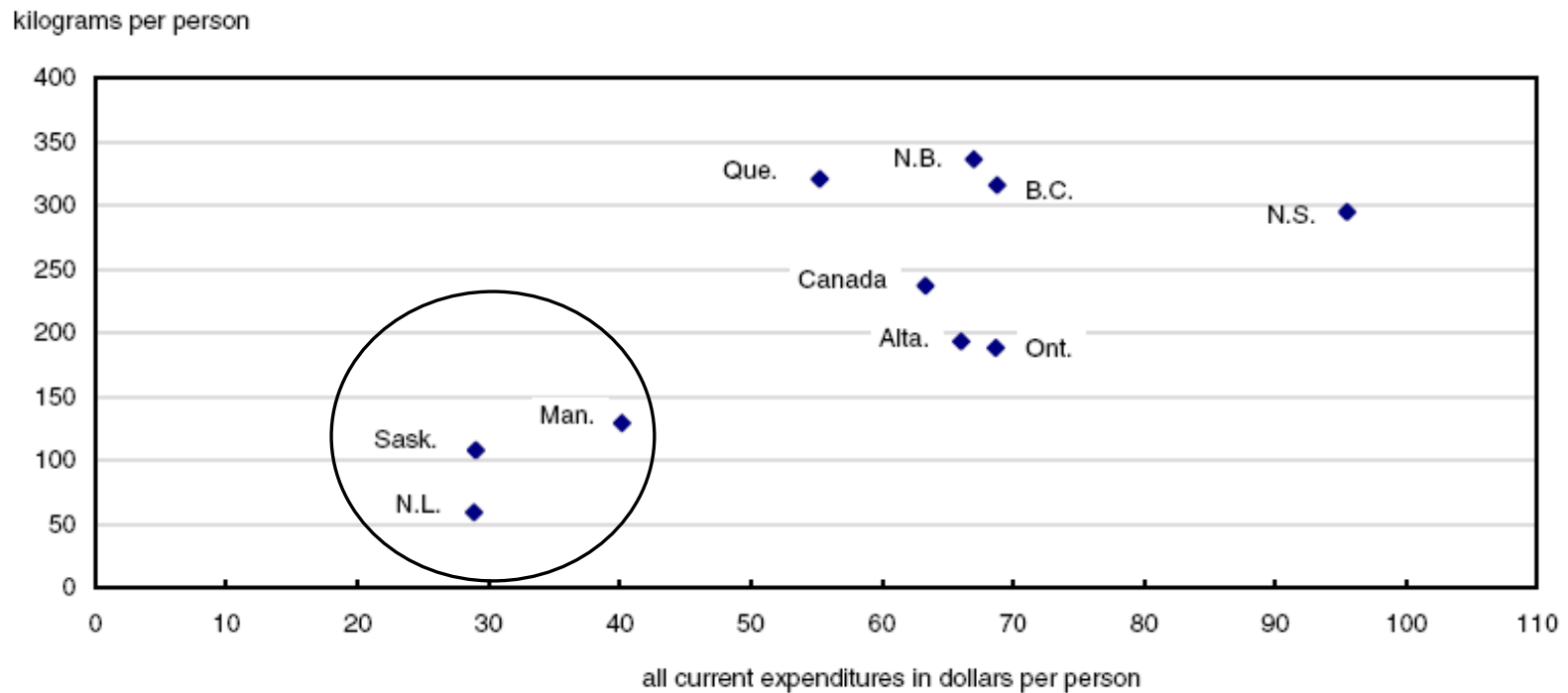
Source: Statistics Canada, Households and the Environment Survey, 2006.

What does this all mean?

- Saskatchewan is really not that different from the rest of the country, disposal-wise
 - Especially on the residential side
 - The challenge – as is it elsewhere in Canada – is to reduce disposal on the non-residential side of the ledger
- But not as much composting or recycling in SK
 - Even allowing for undercoverage – because the undercoverage is everywhere
- Access to recycling programs:
 - maybe a false perception about access in Regina and Saskatoon?

What it may mean : expenditures on waste management services

Chart 2
Waste diverted and local government current expenditures per capita, 2006



Source(s): Statistics Canada, Environment Accounts and Statistics Division

Next steps

- 2008 reference year waste surveys to be in the field in April, 2009
- 2009 reference year Households and the Environment Survey to be in the field in autumn, 2009

Thanks!



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