State of Oregon
Department of
Environmental
Quality

Briefing Paper:
Trends in Oregon Waste Generation 1993-2010

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Primary Author: Peter Spendelow

This document is adapted and updated from a PowerPoint presentation given at the Association of Oregon Recyclers annual conference on June 18, 2011 by Peter Spendelow, solid waste analyst for the Oregon Department of Environmental Quality.

Overview

- What wastes DEQ tracks
- Overall disposal and recovery trends for Oregon
- Trends in generation, disposal and recovery for individual material groups
- More waste composition results
- Summary

Key Points

- Oregon waste generation rose steadily from the early 1990s through 2006, but then dropped sharply in 2008 and 2009.
- Only part of this decline was due to recession. Other factors played a role too.
- Solid wastes are only a small portion of the materials flowing through our economy.
- Substantially more municipal solid waste is disposed of in Oregon landfills than industrial wastes.
- The amount of traditional recyclables going to landfill has decreased strongly in the past 18 years, while recycling tons for these materials have increased.
- Construction materials have shown substantial drop in generation from 2007 to 2009.
- Plastics are a growing high energy-consuming material with a very low recycling rate, making them a potential good candidate for additional recovery efforts. Paper and metal also are good candidates, even though their recovery rate is higher.

Data Tracked by DEQ's Solid Waste Program:

- Waste going to landfills, incinerators, transfer stations, treatment facilities
- Waste imported from other states for disposal
- Waste exported to a general purpose landfill outside of Oregon
- "Counting" waste that is recovered

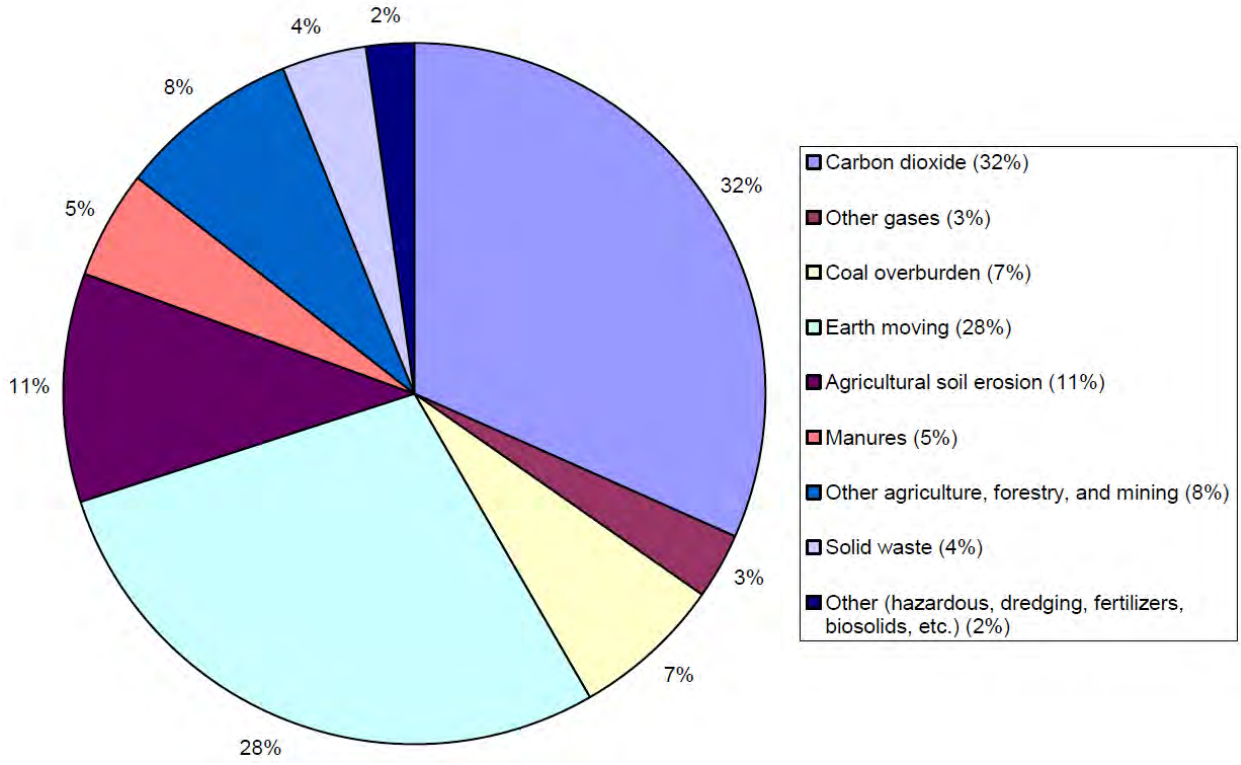
"Counting" waste is the material recovery survey waste as defined in statute. It includes municipal solid waste and some construction and demolition waste, but excludes inert loads, industrial process waste, motor vehicles, scrap metal from major demolition and waste used on-site.

Data Not Tracked by DEQ's Solid Waste Program:

- "Clean Fill": Concrete, asphalt (unless landfilled)
- Waste exported to an industrial or construction and demolition waste landfill
- Anything going down the sewer (including food)
- Discharges to water, air
- Sewage sludge (unless landfilled)
- Mining waste (unless landfilled)
- Dredging (unless landfilled)
- Agricultural wastes (unless landfilled)
- Material burned in wood stoves, fire places, burn barrels, or outdoor piles
- Uncollected litter
- Waste going to a hazardous waste facility
- Waste used on site

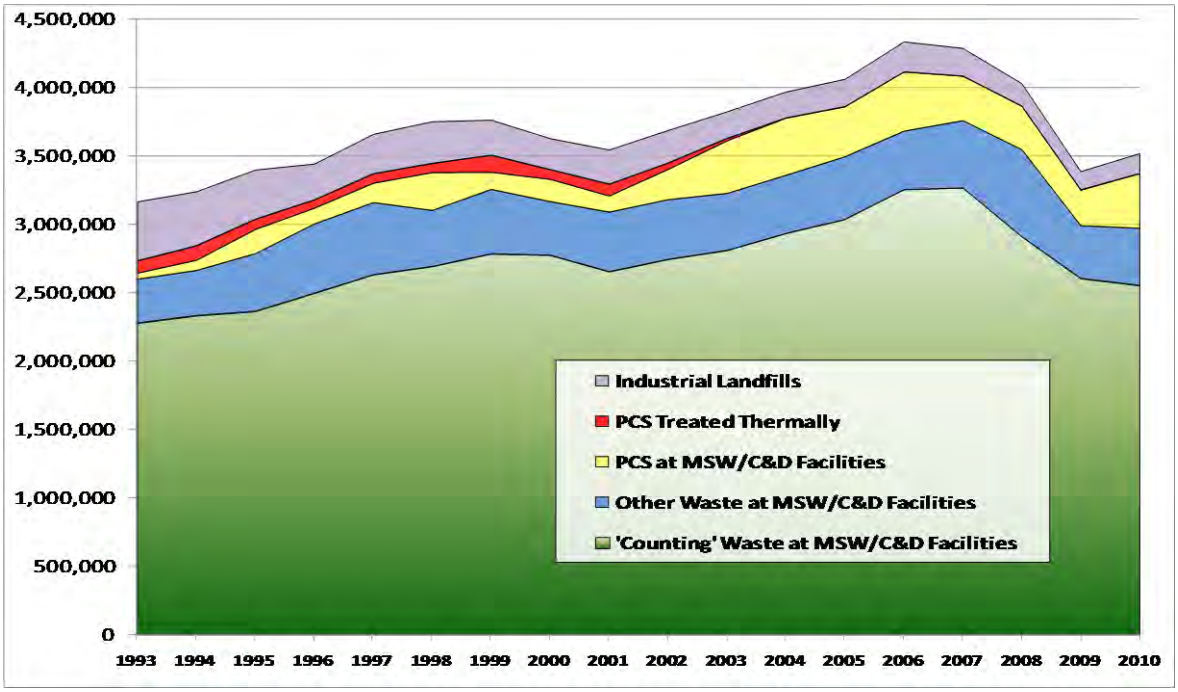
Solid Waste Relative to Other Key Waste/Material Flows

Washington State 2000



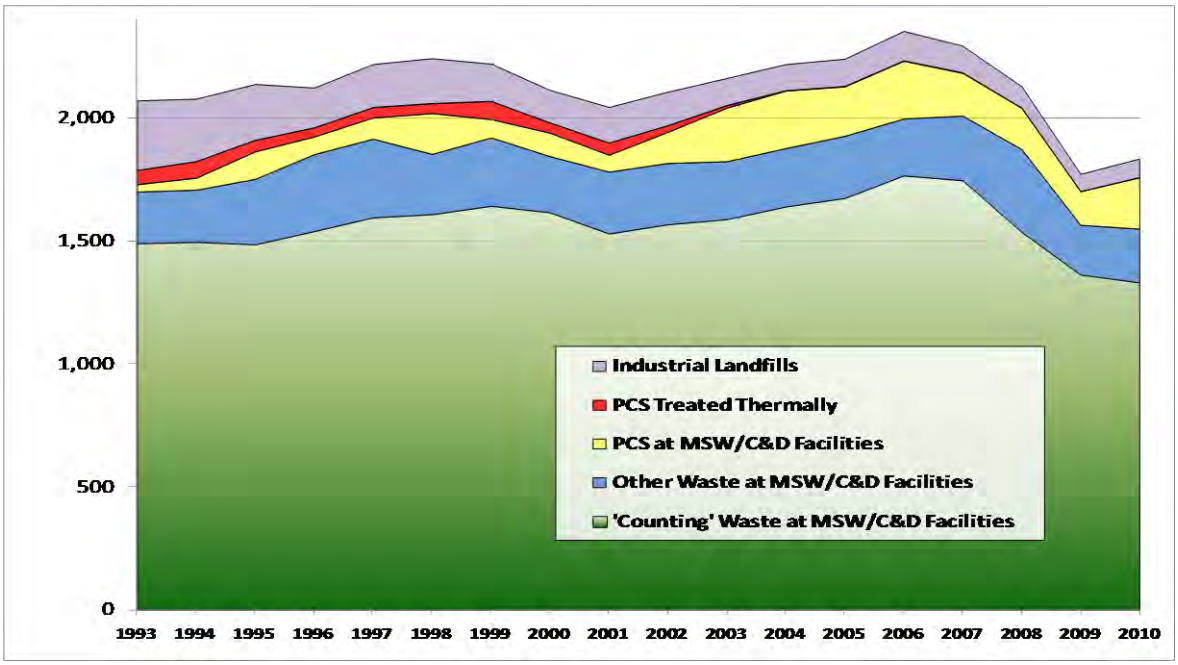
This slide, for the state of Washington, gives an idea of the quantities of different material flows in relation to the size of the solid waste stream. DEQ has not done similar analysis in Oregon. However, as an example, Oregon used 68.4 million barrels of petroleum in 2009, equivalent to about 9.3 million tons of petroleum. Excluding asphalts and road oils, at least 64.8 million tons of this petroleum was burned, producing about 27 million tons of carbon dioxide. This compares to only 3.5 million tons of all solid wastes disposed in landfills or incinerators in 2009.

Disposed Waste from Oregon 1993-2010 (tons)

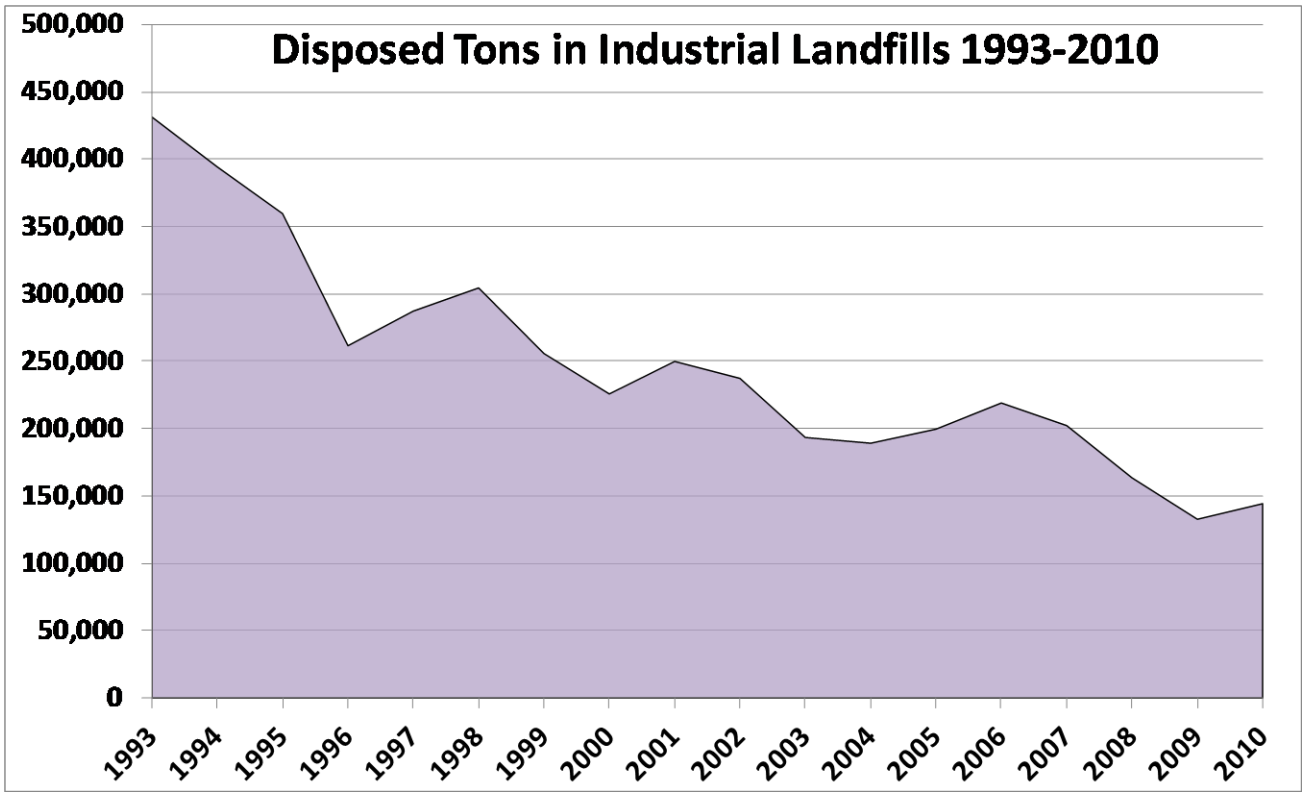


Waste disposal peaked in 2006/2007 in Oregon and then fell sharply the next few years. In spite of rising population, Oregonians disposed of about the same amount of waste in 2010 as they did in 1996. “Counting waste” (municipal solid waste (MSW) plus some construction and demolition (C&D) waste) make up the bulk of disposed solid wastes in Oregon. Relatively little industrial, petroleum-contaminated soil (PCS), agricultural, or other wastes are landfilled in Oregon.

Per Capita Disposed Waste from Oregon 1993-2010 (lbs/person-year)



On a per-capita basis, the decline in disposal is even more pronounced. In both 2008 and 2009, waste disposed fell by about 10% each year. As of 2010, the total waste disposed is roughly 10% lower on a per-capita basis than it has been any time since 1993. The economy certainly played a role in this decline, but other factors are also probably involved.



Industrial “captive” landfills 20 years ago were mainly landfills associated with wood products manufacturing. Over the years, many of these have closed as companies have found better things to do with their bark, log deck cleanup material, and the like, or have gone out of business.

Industrial waste landfills reporting waste disposed in 2010

Landfill Name	2010 Tons
GP-Toledo Mill Landfill	39,968
Roseburg Forest Products Dillard Disposal Site	27,124
ESCO Sauvie Island	21,613
Boise Cascade Wood Products, LLC - Elgin Complex	19,748
Georgia Pacific Consumer Pr Wauna Mill Landfill	18,824
South Coast Lumber, Curry Co.	8,034
Riddle Plywood Plant Disposal Site No. 1 & No. 2	4,040
Riddle Ash Landfill	3,141
Coquille Disposal Site	1,080
Buck Hollow Landfill, Willamina	792
Rough And Ready Disposal Site, Josephine Co.	50
Total	**144,414**

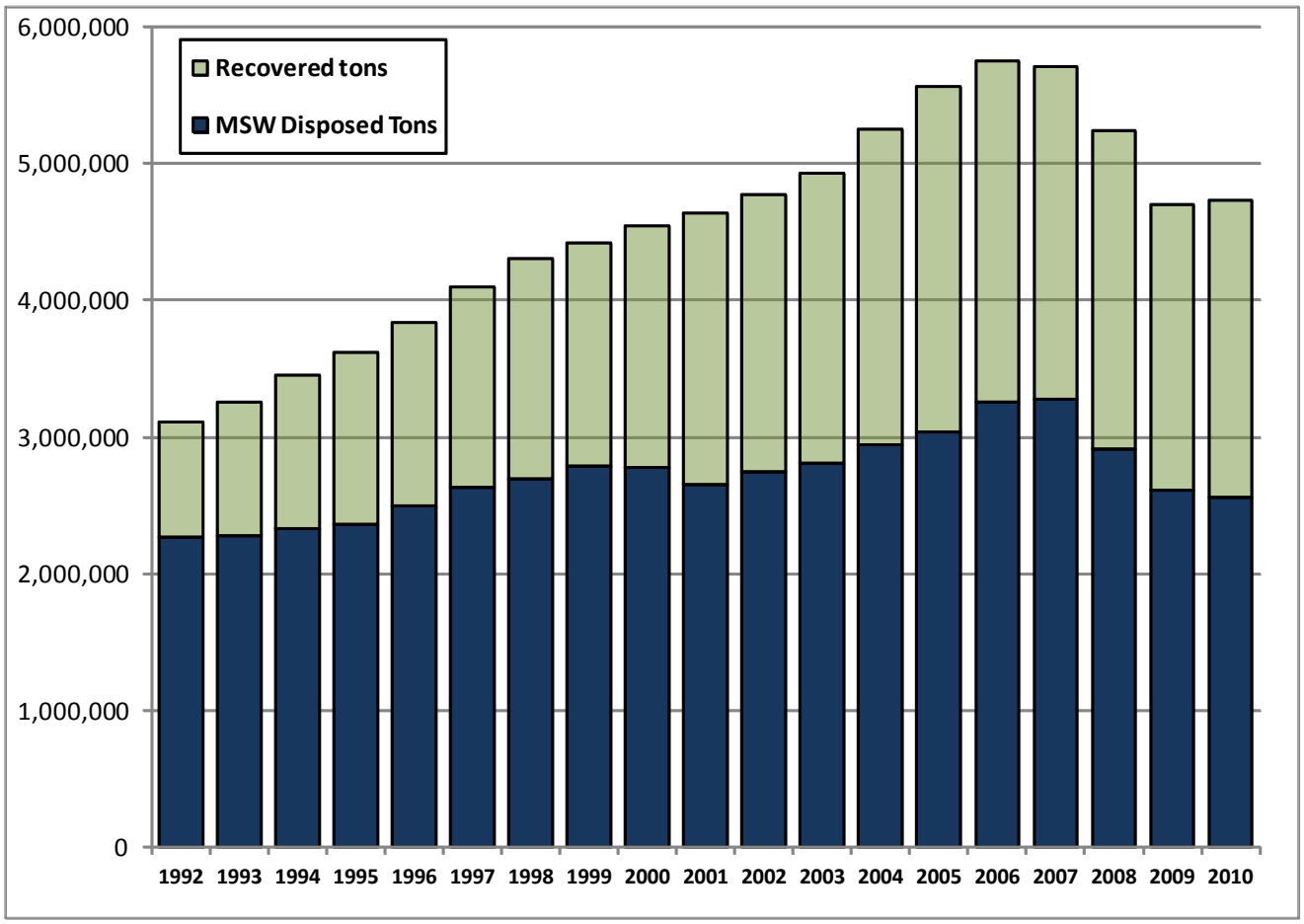
These are all the “captive” industrial waste landfills that reported any waste disposed in 2010. “Captive” landfills are those that companies own and operate to dispose of their own waste and that do not take wastes from other companies. Almost all Oregon industrial landfills are captive landfills.

Waste Disposed in Industrial Landfills,1995 and 2010 (tons)

	1995	2010
Ash	36,787	90,951
Wood	110,184	19,882
Asphalt	13,841	13,003
Paper & Pulp	71,108	11,525
Sludge/Wet Wastes - Industrial	75,762	4,917
Soils	36,438	492
All else	15,629	3,643
Total	**359,749**	**144,414**

The past 15 years have seen very large drops in the disposal of wood products at industrial waste captive landfills.

"Counting Waste" Disposed & Recovered 1993-2010

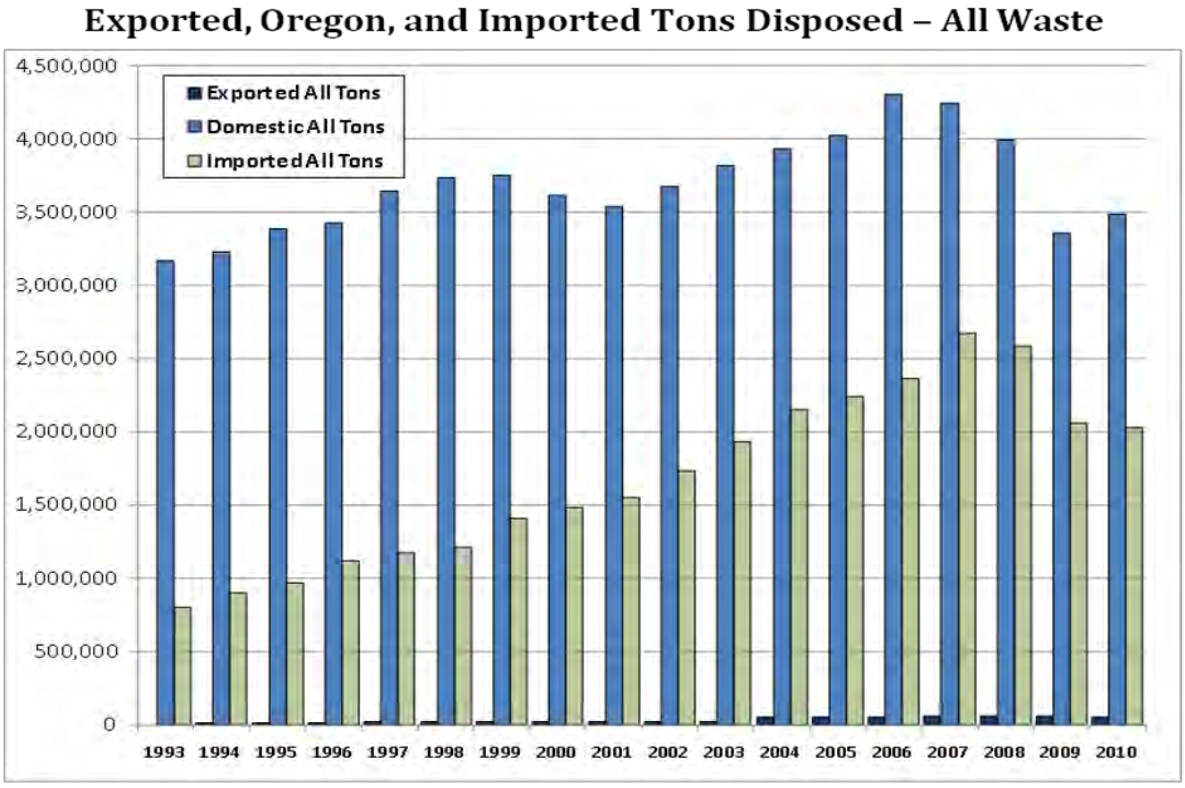


Looking just at "counting waste," generation (defined as the sum of disposal and recovery) climbed much faster than disposal from 1992 to 2006, but starting in 2007, generation fell sharply.

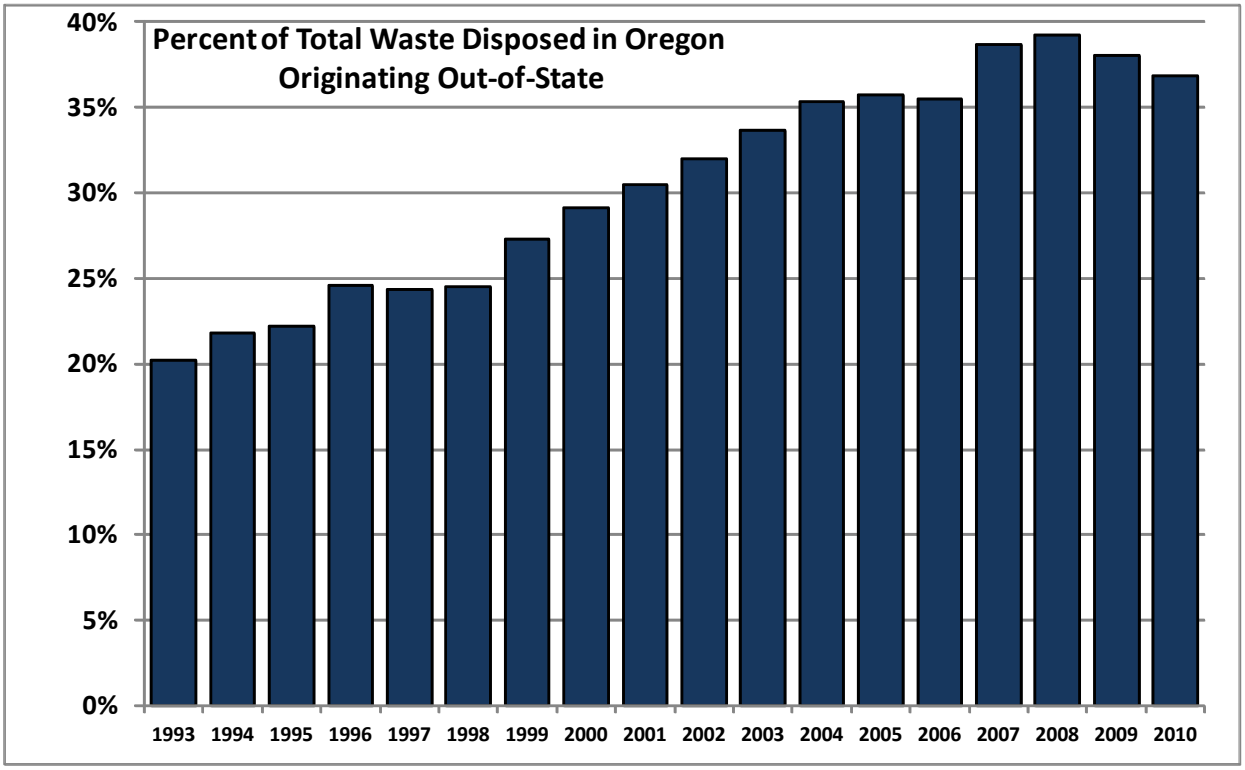
"Counting" waste is the material recovery survey waste as defined in statute. It includes municipal solid waste (MSW) and some construction & demolition waste (C&D), but excludes inert loads, industrial process waste, motor vehicles, scrap metal from major demolition and waste used on-site.

Recovered tons include all materials recycled, and also materials burned for energy recovery that are legitimate fuels with no viable market for recycling that material.

Disposed tons indicate materials landfilled or incinerated.



Oregon imports substantial tonnage of solid waste from other states (mainly Washington), but exports very little waste to other states. Importation of waste rose steadily from 1997 to 2007, but fell in 2008 and 2009.



The proportion of waste entering Oregon from out of state increased steadily until recently, as jurisdictions in Washington closed landfills and began transporting their waste to large regional landfills.

DEQ conducts waste composition studies every two to four years to determine types of waste disposed.

- In 2009-10, samples collected at 58 disposal sites
- Samples collected every month of the year
- Route truck samples pre-selected based on recent disposal records
- Other samples selected randomly during visits
- 950 samples collected and sorted in 2009-10
- Additional special studies of inbound waste to recovery facilities and of residential recycling and disposal, done for Metro.

Sorting the load. We sorted into 130 categories in 2009/2010 study

Contamination Analysis

- Used to determine clean / dry weight of disposed materials
- Field-sorted material is contaminated. Example - Food waste adheres to or is absorbed into other materials
- After sorting, took 40 full samples back to a facility to clean and dry each material, and measure the amount of each contaminating material
- Also did contamination analysis on an additional 108 rigid plastic container samples

Contamination analysis: Re-sorting and cleaning selected field-sorted samples

Contamination Correction Factors for Selected Materials 2009-10

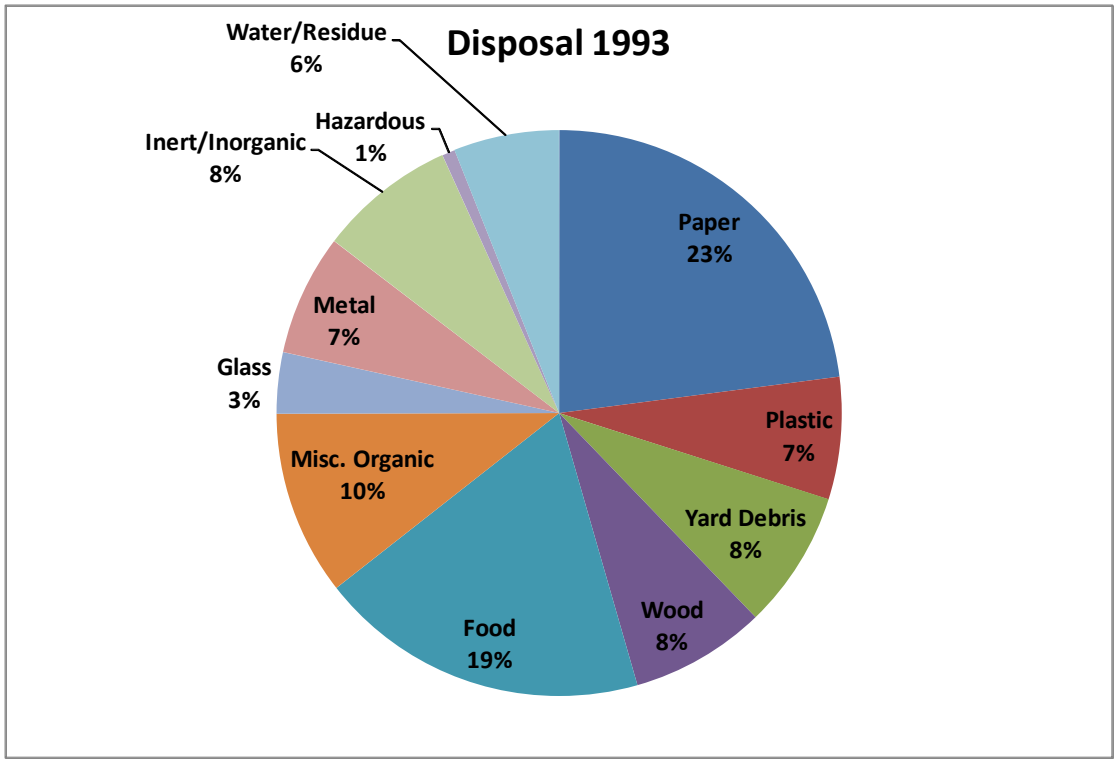
	Field	Corrected	Factor	Factor 90% confidence interval
Cardboard	3.26%	2.80%	-14.29%	(-19.54 to -9.61%)
Hi grade paper	0.91%	0.88%	-3.47%	(-8.42 to 3.78%)
Newspaper	0.86%	0.72%	-16.29%	(-22.91 to -10.13%)
Other compostable nonrecyclable paper	5.23%	2.99%	-42.77%	(-45.52 to -39.85%)
Rigid Plastic Containers (RPCs)	1.86%	1.47%	-21.07%	(-25.08 to -17.59%)
Plastic film - recyclable	1.12%	1.05%	-6.43%	(-11.59 to -2.10%)
Plastic film - non-recyclable	3.70%	2.38%	-35.67%	(-39.58 to -31.05%)
Leaves and grass	3.63%	3.69%	1.59%	(0.43 to 2.33%)
Wood	11.51%	11.10%	-3.51%	(-5.36 to -1.96%)
Food	16.99%	17.62%	3.68%	(2.09 to 5.01%)
Glass	1.95%	2.01%	2.77%	(-0.46 to 6.72%)
Aluminum foil / food trays	0.14%	0.08%	-41.19%	(-46.60 to -35.80%)
Water and Residue (Contamination)	0.00%	5.89%		

These correction factors show that for light or absorbent materials such as aluminum foil, film plastic, and paper towel, the degree of contamination of material can be substantial. Non-absorbent materials like wood and glass showed little contamination. This shows that waste composition studies that do not take into account the cross-contamination of materials or the absorption of water may end up significantly overestimating the amount of certain types of paper and plastic in the waste stream.

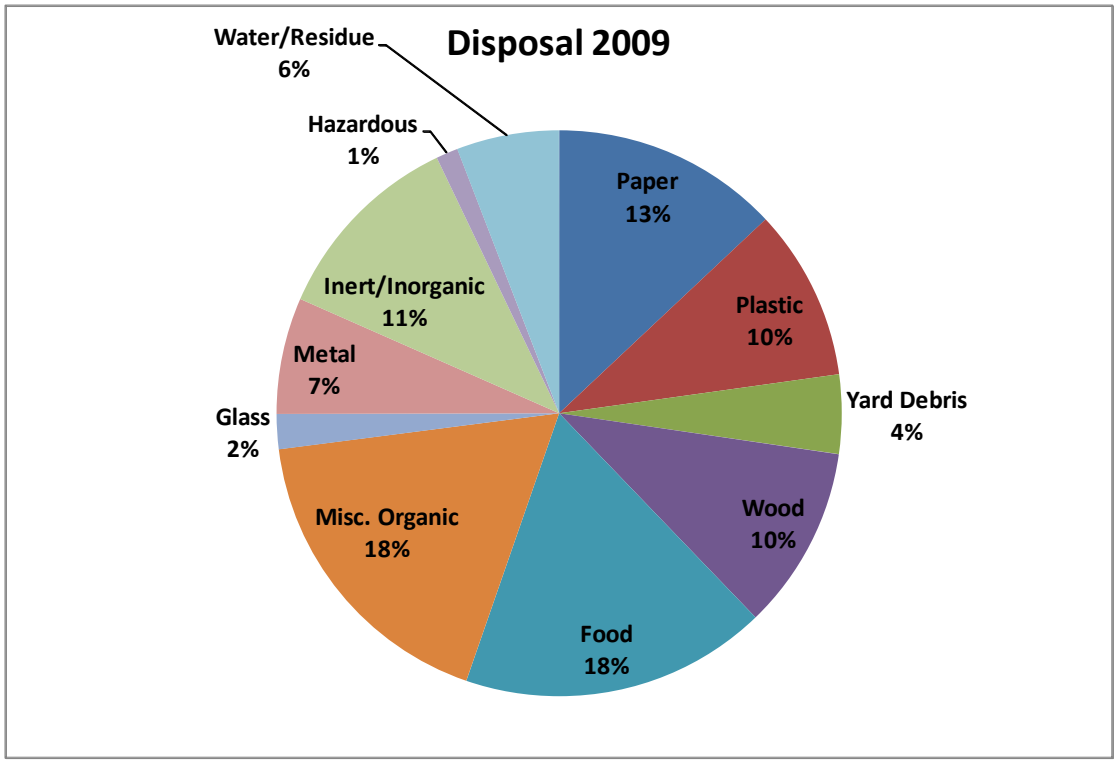
90% Confidence Intervals
for selected materials (corrected) 2009-10

Material	Corrected	90% conf. Int.
Cardboard	2.80%	(2.52 - 3.10%)
Hi grade paper	0.88%	(0.73 - 1.04%)
Newspaper	0.72%	(0.63 - 0.82%)
Other compostable nonrecyclable paper	2.99%	(2.76 - 3.26%)
Rigid Plastic Containers (RPCs)	1.47%	(1.36 - 1.58%)
Plastic film - combined	3.43%	(3.17 - 3.72%)
Leaves and grass	3.69%	(3.01 - 4.45%)
Unpainted lumber	2.75%	(2.23 - 3.27%)
Food	17.62%	(16.66 - 18.59%)
Glass	2.01%	(1.68 - 2.43%)
Aluminum beverage cans	0.11%	(0.10 - 0.13%)
Aluminum foil / food trays	0.08%	(0.07 - 0.09%)
Gypsum wallboard	2.83%	(2.23 - 3.43%)
Computers & monitors	0.18%	(0.08 - 0.30%)
Asphalt roofing & tarpaper	3.90%	(3.17 - 4.66%)

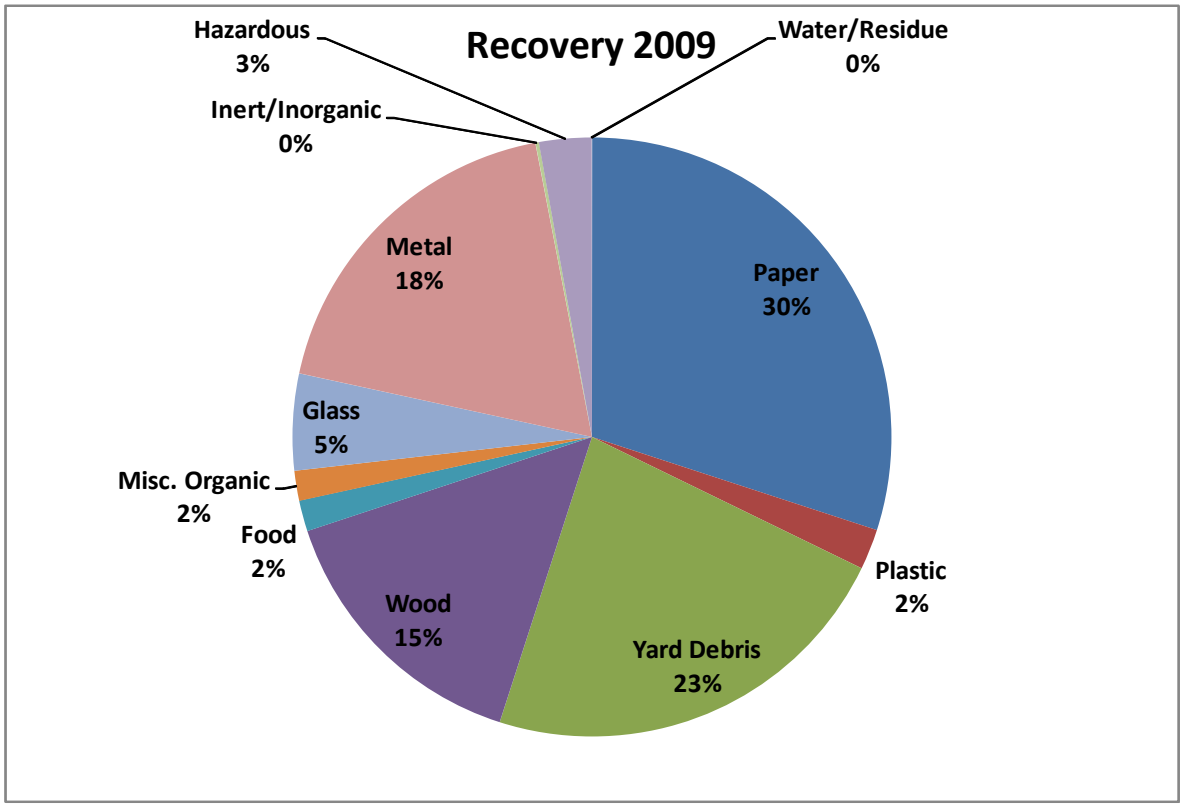
Note that the precision of waste composition results vary strongly between materials. Materials that appear regularly in most garbage samples have relatively precise results (narrow confidence intervals). Examples include materials such as newspaper and plastic containers. In contrast, items that are highly variable from sample to sample have results with broad confidence intervals, such as the five materials with results highlighted in yellow. These are usually materials that are mainly absent from most samples, but present in high quantities in a few samples. For example, if few vehicles bring gypsum wallboard for disposal, but those that do have loads that are almost entirely gypsum wallboard, the results of a sampling study could vary sharply if a few of these loads were either randomly selected or randomly missed in the random sample selection process.



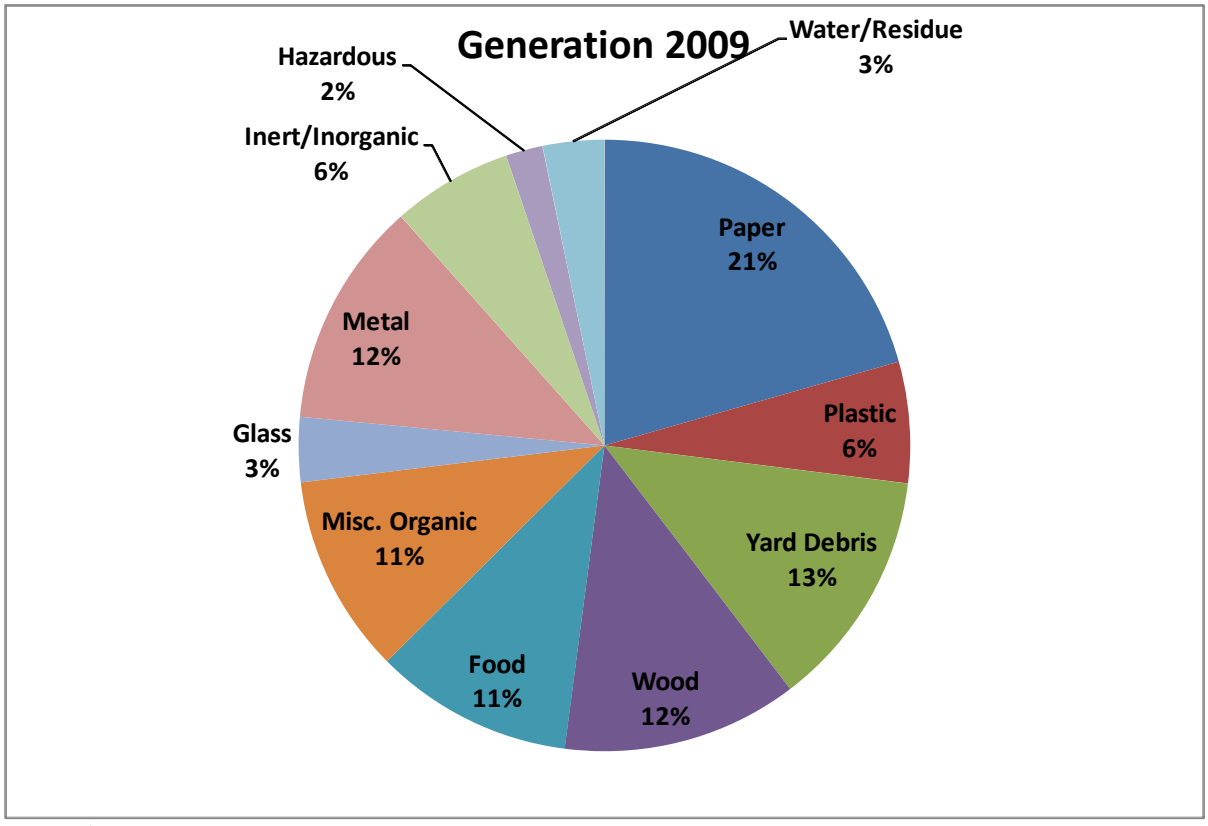
This pie chart shows the composition of disposed "counting" waste in 1993. These are estimates of the "clean, dry" weights of materials disposed, corrected for contamination. Back in 1993, "Paper" was the largest major category of waste being disposed, with "Food" second. This chart excludes industrial and other non-counting wastes.



By 2009, the composition of disposed waste changed dramatically. Paper fell from 23% to 13%. Food is now the largest category, although it is little-changed from 1993 in terms of its share of the whole. Yard debris dropped in half. Miscellaneous organics (carbon-containing) that are difficult to recycle, such as textiles, carpet, asphalt roofing and tires, all increased, as did plastics.



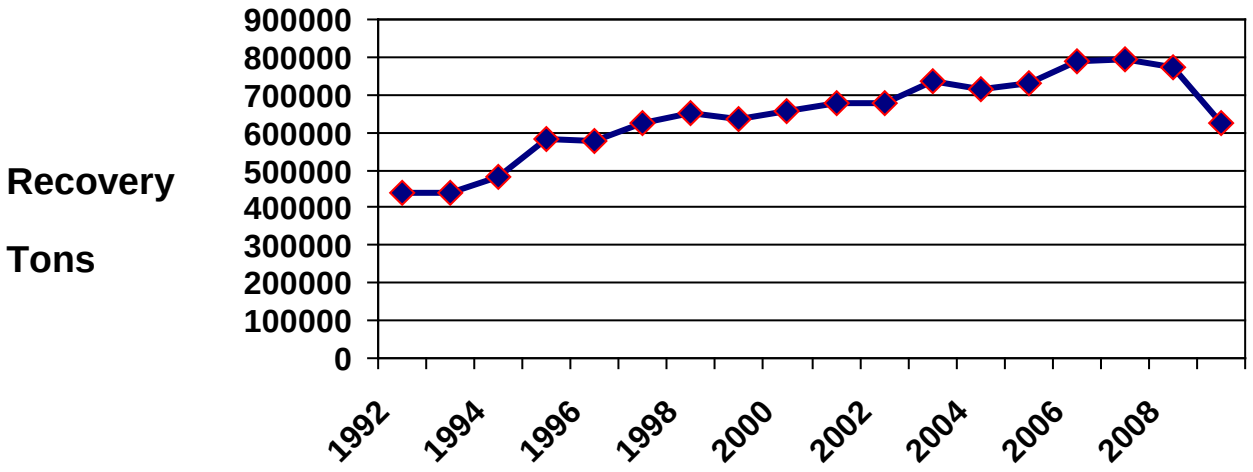
Looking at recovered material in 2009 shows very different results from disposal. Paper is the largest category, but yard debris and wood (lumber) also have substantial tons recovered. Metal numbers are also high. Plastics recycling is low. Most of the "hazardous" material recovered is used motor oil.



Adding together disposal and recovery give the total generation of materials that have become solid wastes.

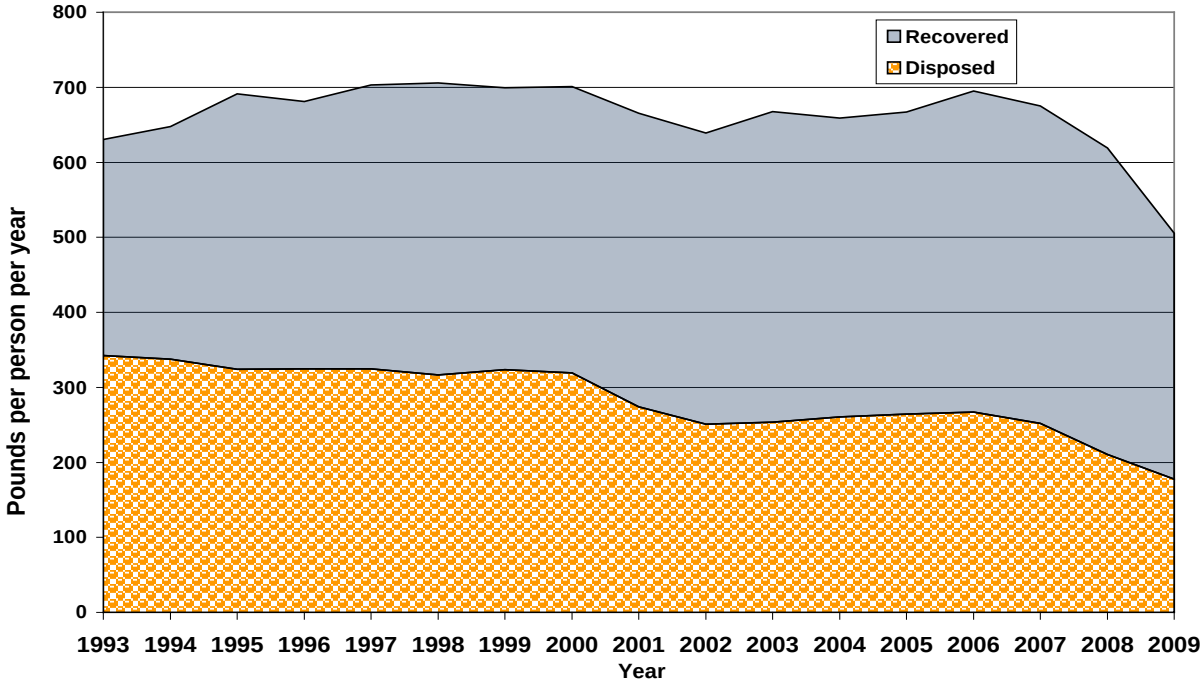
All Paper: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	1993-95	1998	2000	2002	2005-06	2009-10
	27.35%	24.35%	23.10%	20.62%	19.64%	16.99%

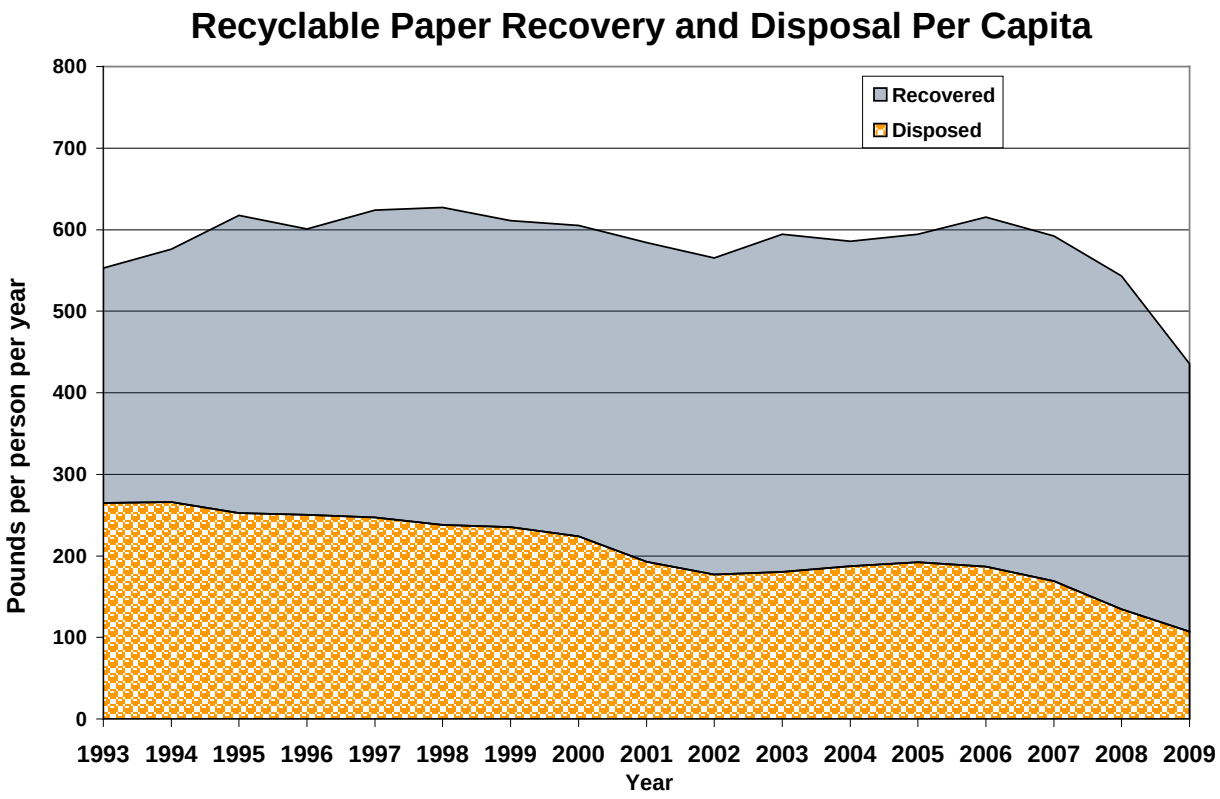


The top table shows how the percentage of paper in the waste stream has fallen over the years, according to DEQ's waste composition study. The graph below displays recovered tons from the annual material recovery survey. This shows that up to 2008, paper was being recycled in increasing amounts, reducing disposal.

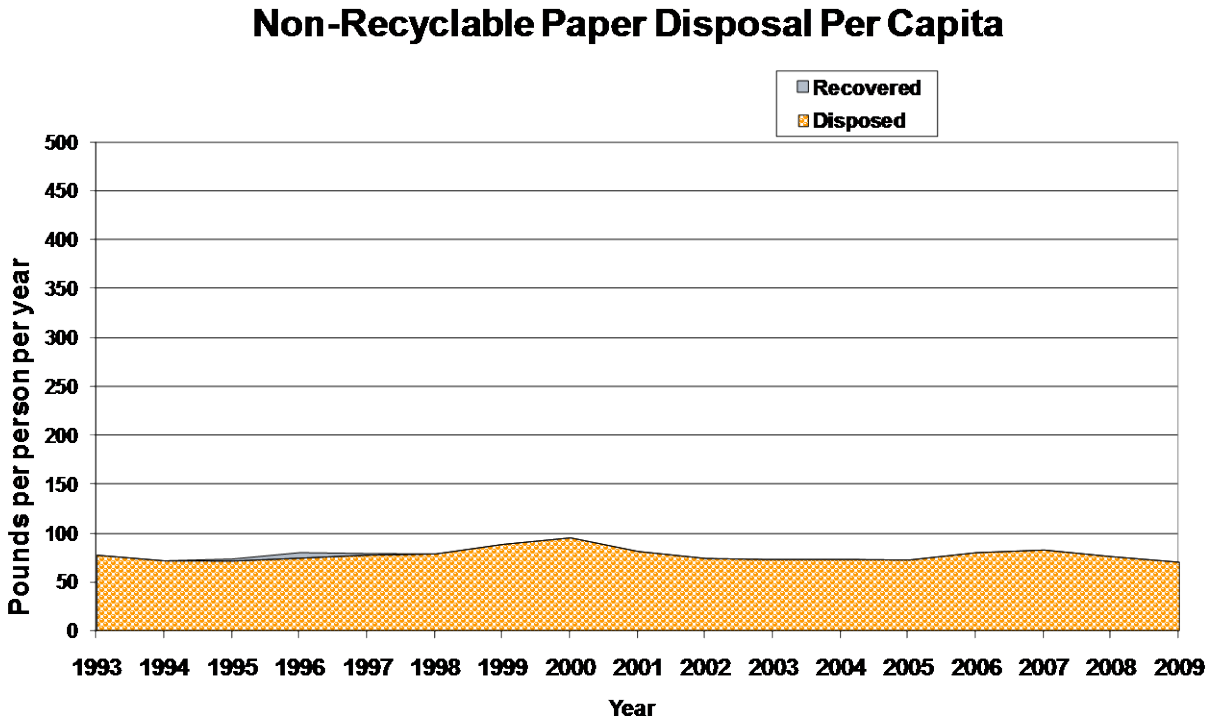
Paper Recovery and Disposal Per Capita



Using information from the slide before, plus figures for total waste disposed and for Oregon's population, per-capita disposal and recycling of all paper can be calculated. As can be seen, total generation of paper was fairly constant until about 2007, when it began declining. For this period, however, although generation was nearly constant, recovery of paper climbed substantially, matched by an equal decline in disposal. Both disposal and recovery declined in 2008 and 2009. There simply was less paper being used that could be either disposed or recycled. Part of this was likely due to less production of newspaper and magazines, as people increasingly used the Internet as their source of information. Poor economic conditions also probably affected how much cardboard is used for shipping products.



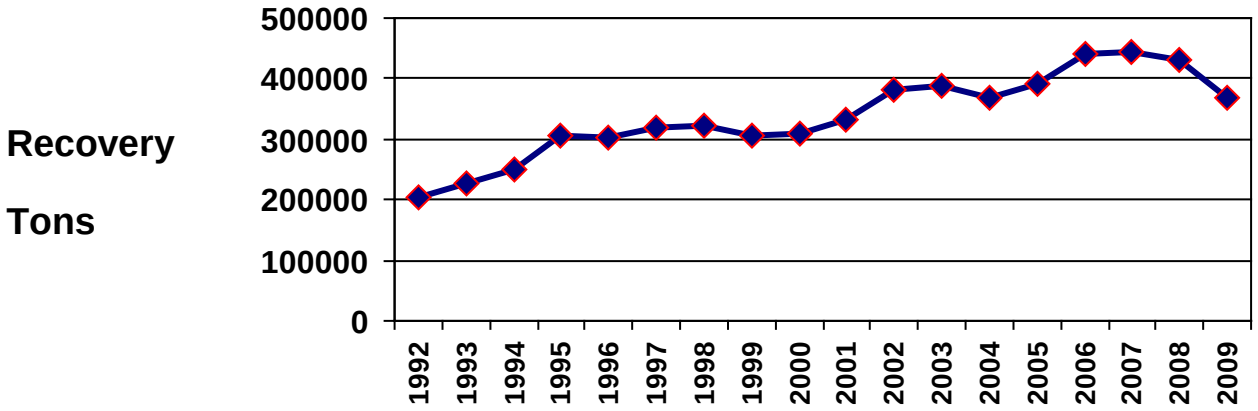
This slide shows the same sort of information as the previous slide, but only for the recyclable grades of paper. Materials like paper towels and mixes of paper and other materials are excluded from this slide.



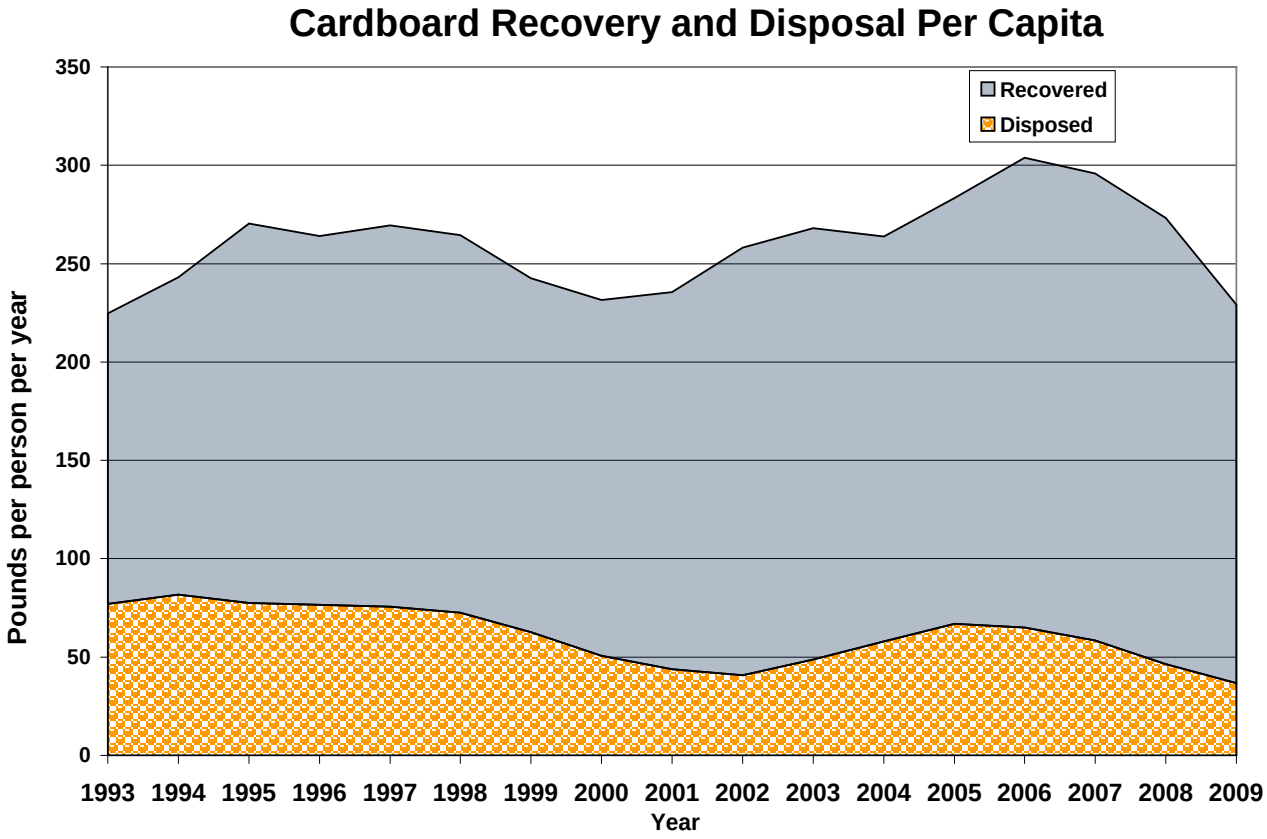
Looking only at non-recyclable paper such as paper towels, the generation of this paper has remained almost constant over the years on a per-capita basis.

Cardboard: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	1993-95	1998	2000	2002	2005-06	2009-10
	6.49%	5.45%	3.69%	3.23%	4.61%	3.26%



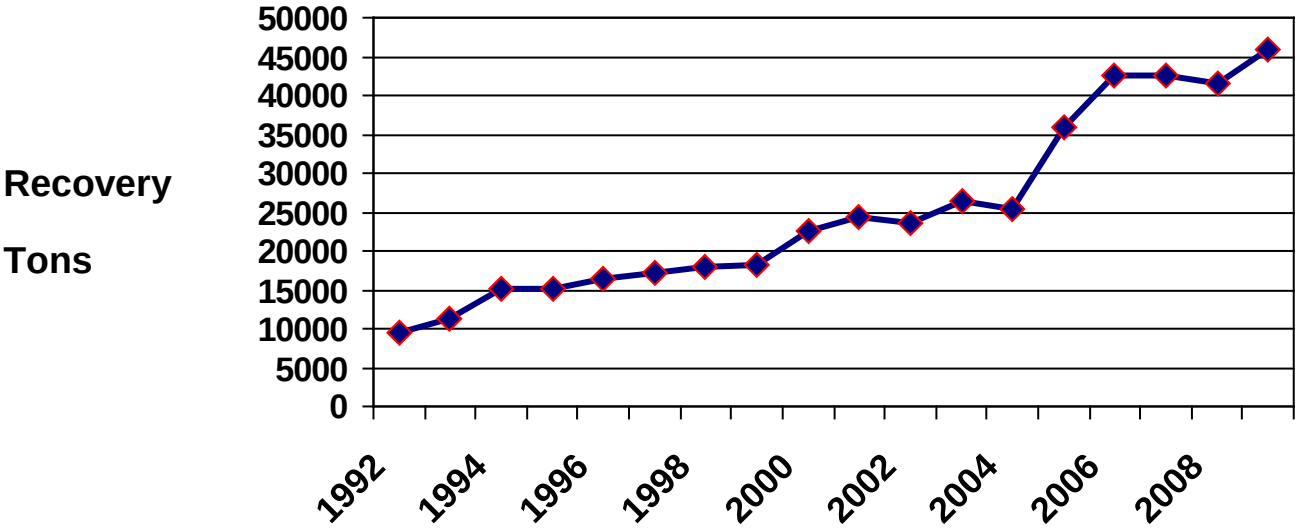
DEQ has limited information about the various types of paper in the material recovery survey, because many types of paper are frequently mixed together to form a single paper grade. For example, “old newsprint” as purchased by a paper mill probably contains substantial tonnage of magazines, junk mail and office paper in addition to newspaper. Corrugated cardboard is usually recycled separately from the other paper grades, and this slide shows the same sort of information as the slide on overall paper.



Looking at this on a per-capita basis shows the large majority of cardboard is getting recycled.

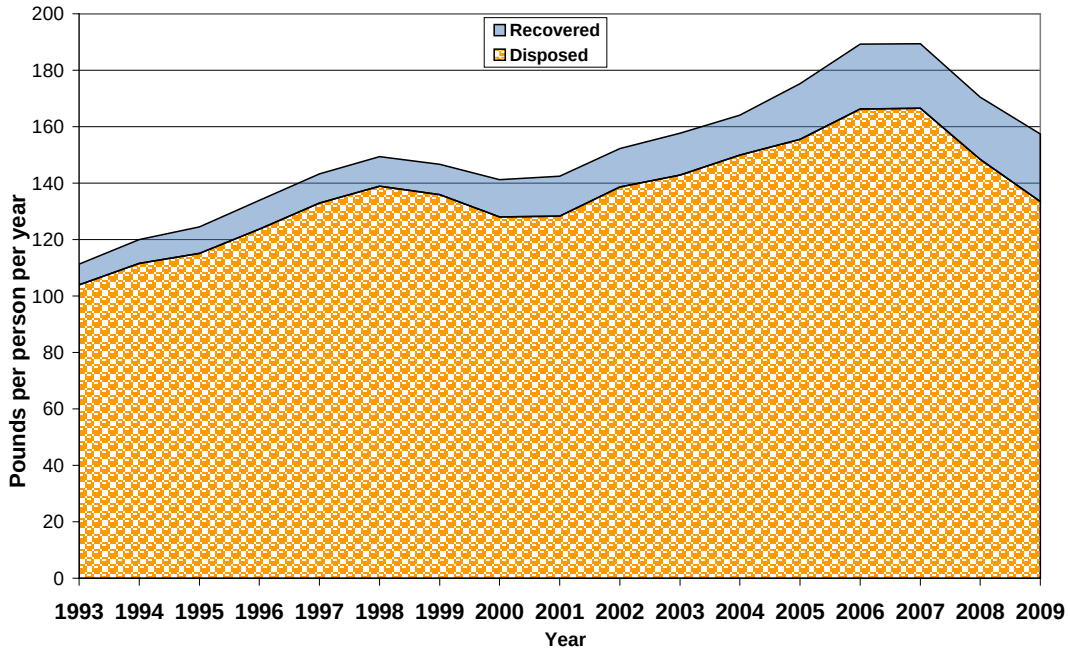
All Plastic: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	1993-95	1998	2000	2002	2005-06	2009-10
	8.84%	10.45%	9.70%	10.95%	11.24%	11.56%



Total plastic shows a very different trend from the trends shown for paper. Recovery of plastic for recycling has climbed steadily since DEQ's first material recovery surveys in 1992. It even has held its own during the recessionary period in 2008 and 2009. At the same time, though, the amount of plastic being disposed increased.

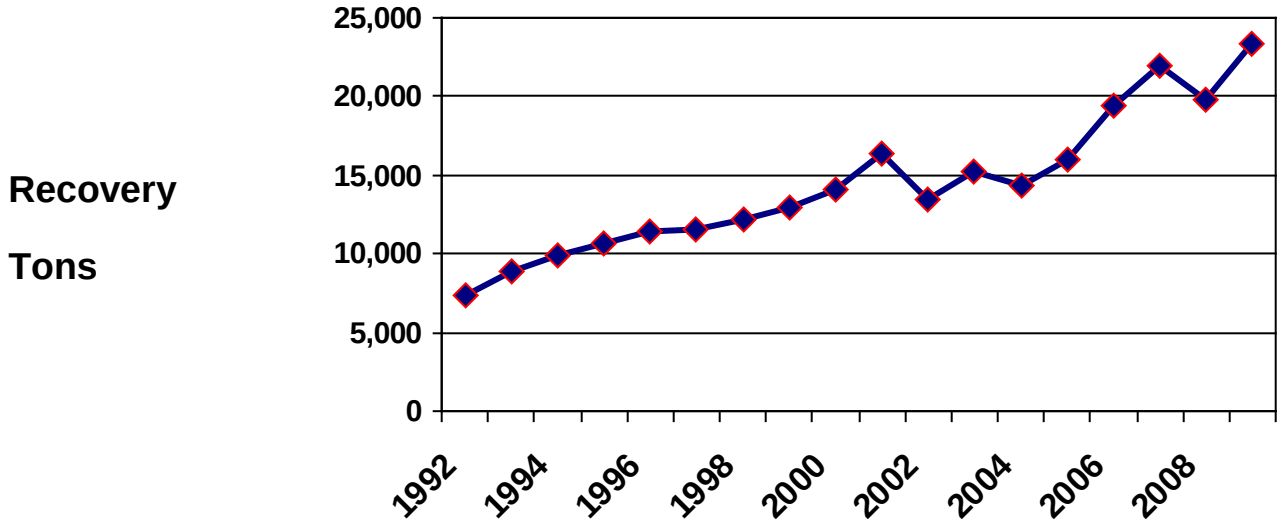
Plastic Recovery and Disposal Per Capita



Looking at per capita disposal and recycling of plastic over this whole period gives a better picture. Total generation of plastic increased fairly regularly until 2007. Although plastic recycling increased regularly over this period, it was not enough to keep up with the generation of plastic, so total plastic disposal increased.

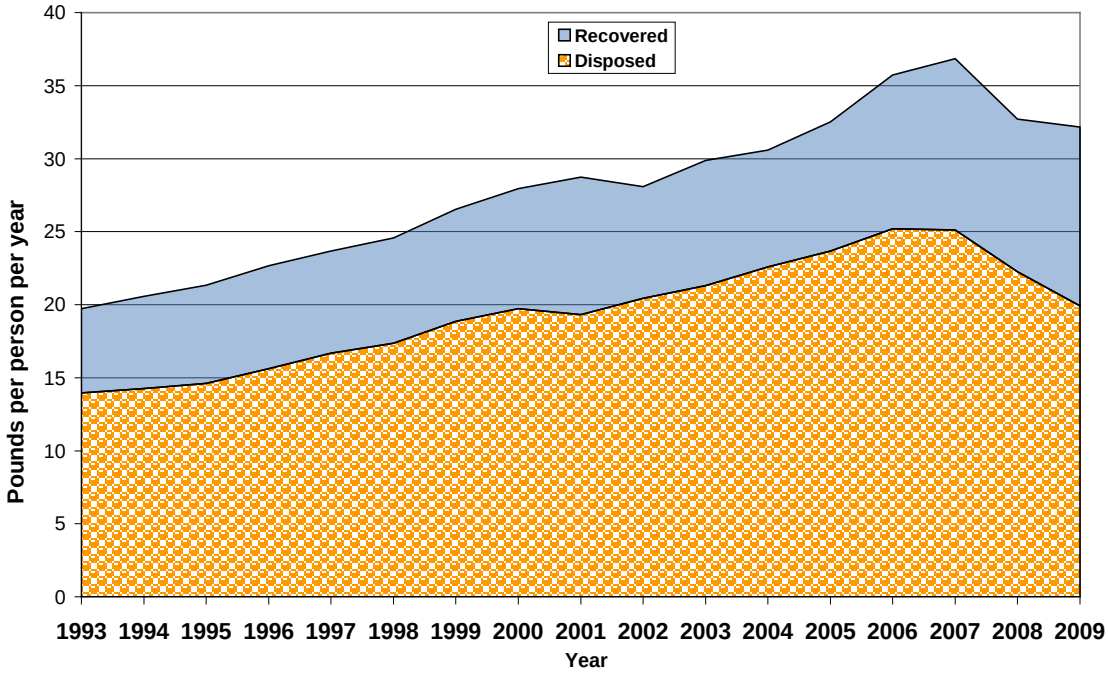
Rigid Plastic Containers: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	1993-95	1998	2000	2002	2005-06	2009-10
	1.11%	1.34%	1.51%	1.67%	1.76%	1.86%

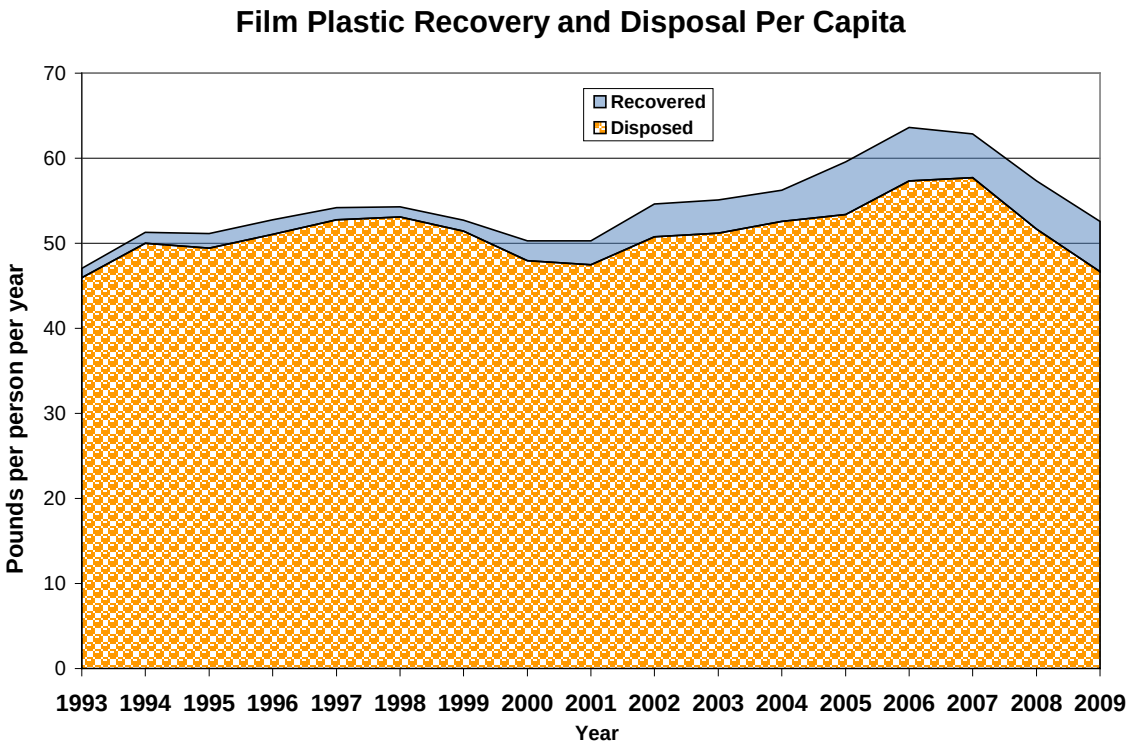


The only types of plastics which most households in Oregon can easily recycle are certain types of rigid plastic containers. Almost all plastic bottles are accepted in most household and commercial recycling collection programs, and many also accept certain types of plastic tubs and pails. In the earlier years, most of the plastic containers being recycled were soft drink bottles under the bottle bill. As collection programs began using large roll carts to collect recyclables from households, the tonnage of rigid plastic containers being collected for recycling increased substantially. In spite of this, the proportion of disposed garbage that is rigid plastic containers continues to increase regularly.

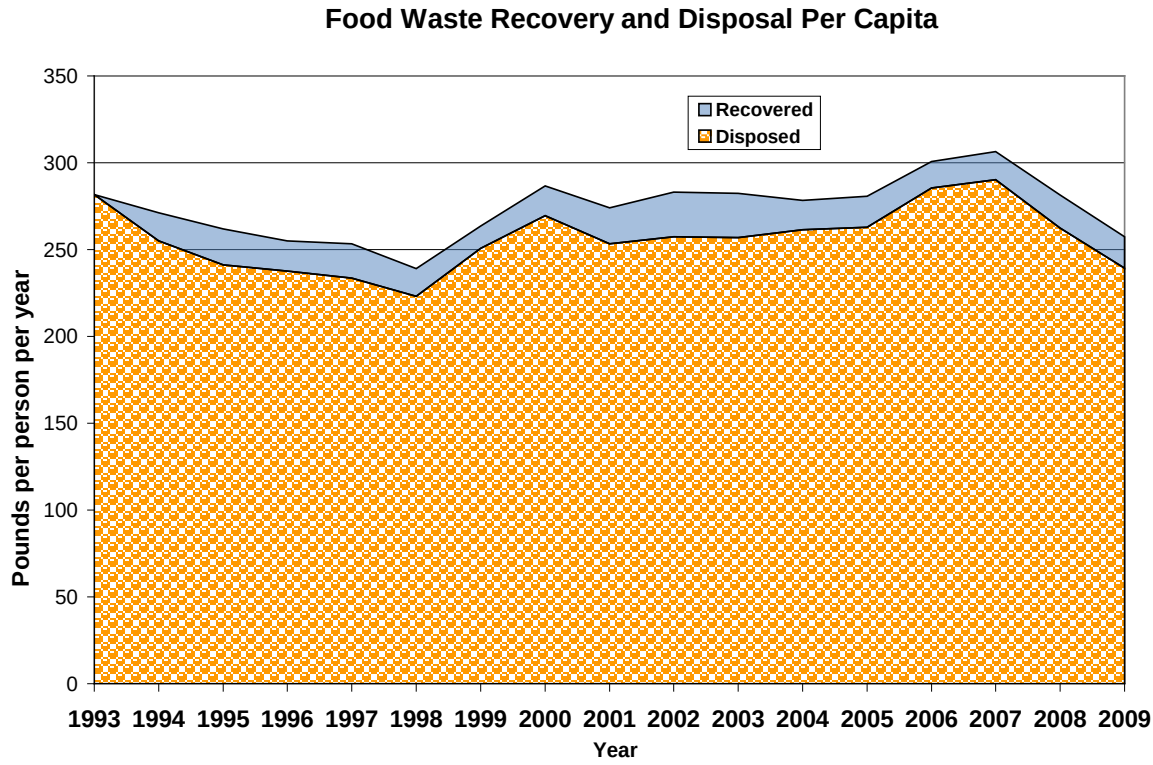
Rigid Plastic Container Recovery and Disposal Per Capita



Looking at just rigid plastic container disposal and recycling shows a similar picture, except that generation of plastic containers did not decline nearly as much as generation of most other materials declined in 2009. Recovery of plastic containers has increased substantially in the past five years or so, probably due mainly to the increase in the use of large roll carts for curbside recycling collection during that period.

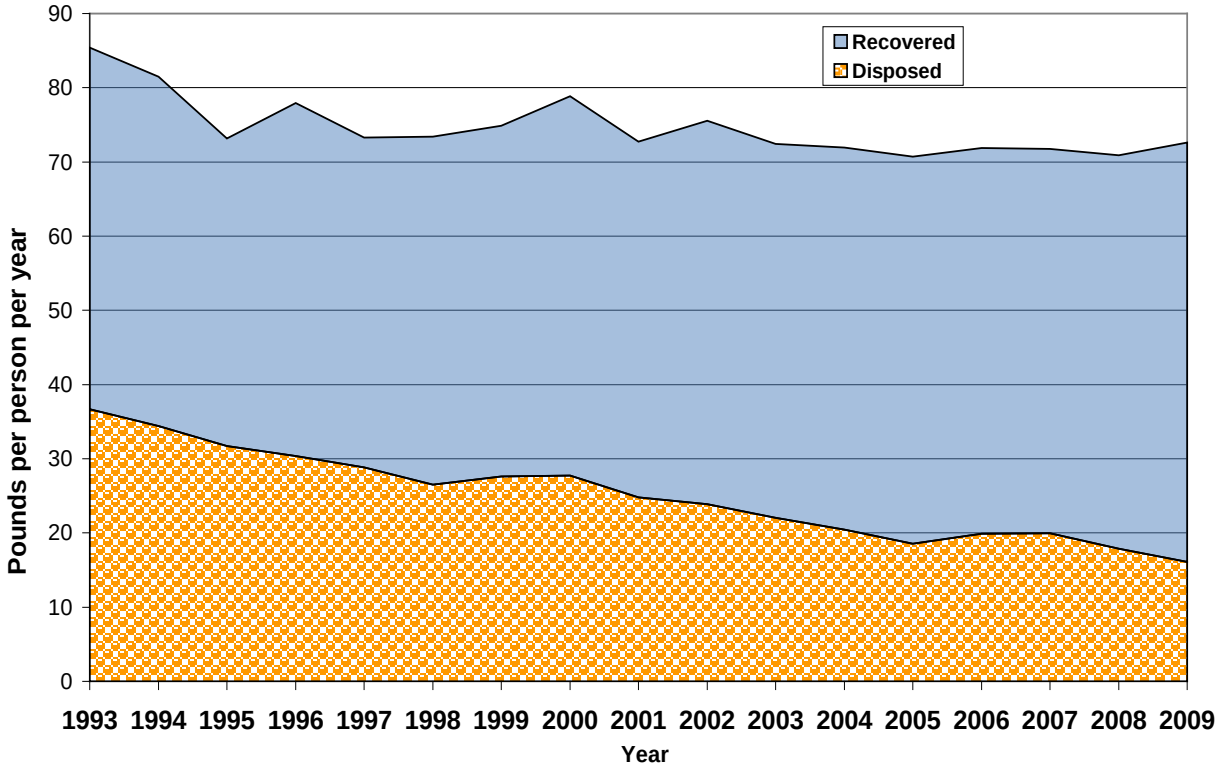


Film plastic recycling is significantly less than rigid plastic container recycling but has been increasing in recent years. Most plastic film recycled probably comes from large commercial generators, as residential generators do not have many options for recycling plastic film.



Food waste generation has remained relatively consistent over the years. In the earlier years, most food waste recovery was fats and greases for fuel and chemical products. In later years, food waste composting became the more prominent recovery option.

Container Glass Recovery and Disposal Per Capita



Glass generation has remained remarkably stable over the years, even in the past few years when generation of most other materials has decreased sharply. Disposal of glass has continued to decline, while recycling has seen an equivalent increase. Most of the glass redeemed under the Oregon Bottle Bill gets recycled back into beverage containers, but nearly a third of curbside-collected glass gets crushed and used as a very low-grade aggregate material rather than being recycled back into a glass object.

Recycled Glass Utilization

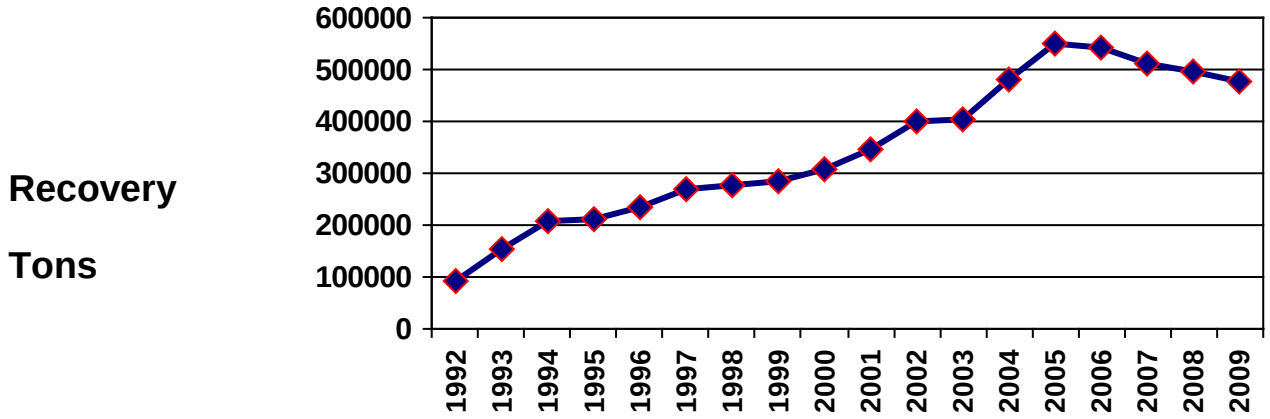
2009 data Market ==>	Glass	Aggregate	Unknown	Total
Bottle Bill distributors	53,008	326		53,334
Hauler/Other	34,073	16,536	578	51,187
Unknown	3,558			3,558
Total	90,639	16,862	578	108,079

2005 data Market ==>	Bottles or Fiberglass	Aggregate/ Landfill Drainage	Total
Bottle Bill Glass	55,556	631	56,187
Curbside/ Other	28,651	9,832	38,483
Total	84,207	10,463	94,670

The use of glass as aggregate, especially in landfill roadbeds or other similar uses at disposal facilities, has increased in recent years.

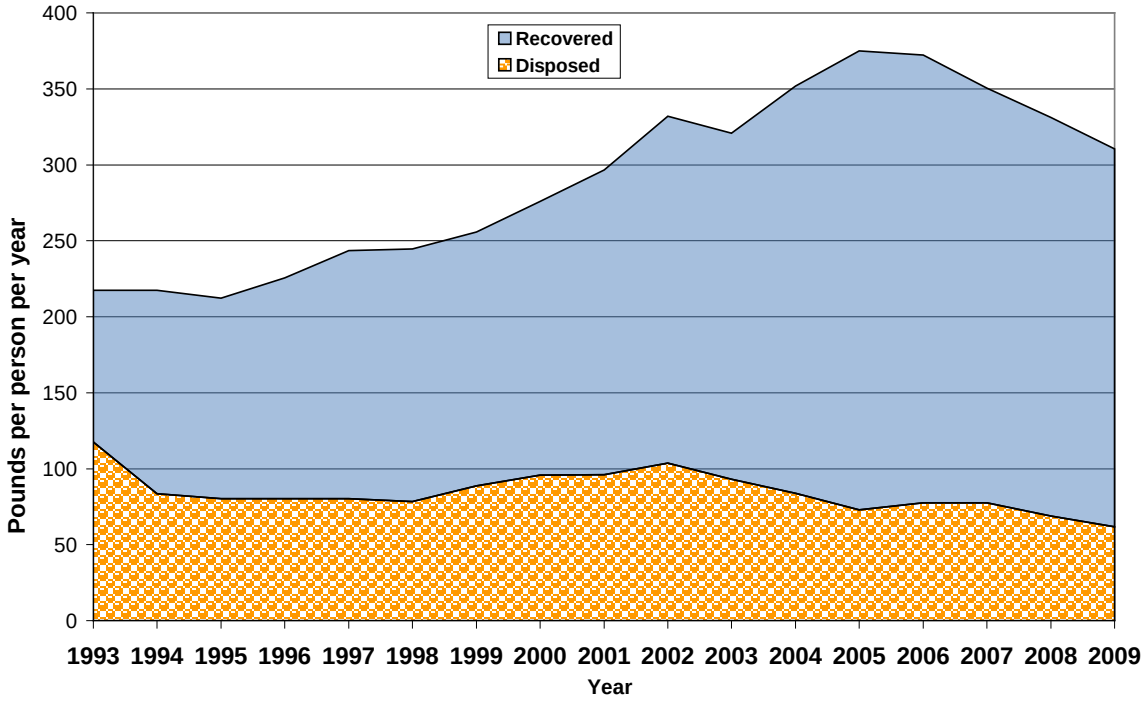
Yard Debris: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	Metro	1986-87	1989-90	1993-94	1998	2000	2002	2005-06	2009-10
		10.50%	11.31%	5.10%	3.76%	4.49%	4.51%	3.16%	2.01%
	Rest of Oregon		1992-93	1994-95	1998	2000	2002	2005-06	2009-10
			9.42%	5.80%	5.85%	7.05%	8.12%	5.13%	6.45%



Yard debris made up a substantial portion of the waste stream in the Portland metro area in the 1980s, before yard debris collection and composting operations became established. The strong drop in yard debris disposal in the early 1990s is due mainly to the establishment of these programs and facilities. Many parts of the rest of Oregon also have yard debris composting programs, but substantial areas are not fully served. Statewide, yard debris recovery increased strongly through about 2006, then leveled off.

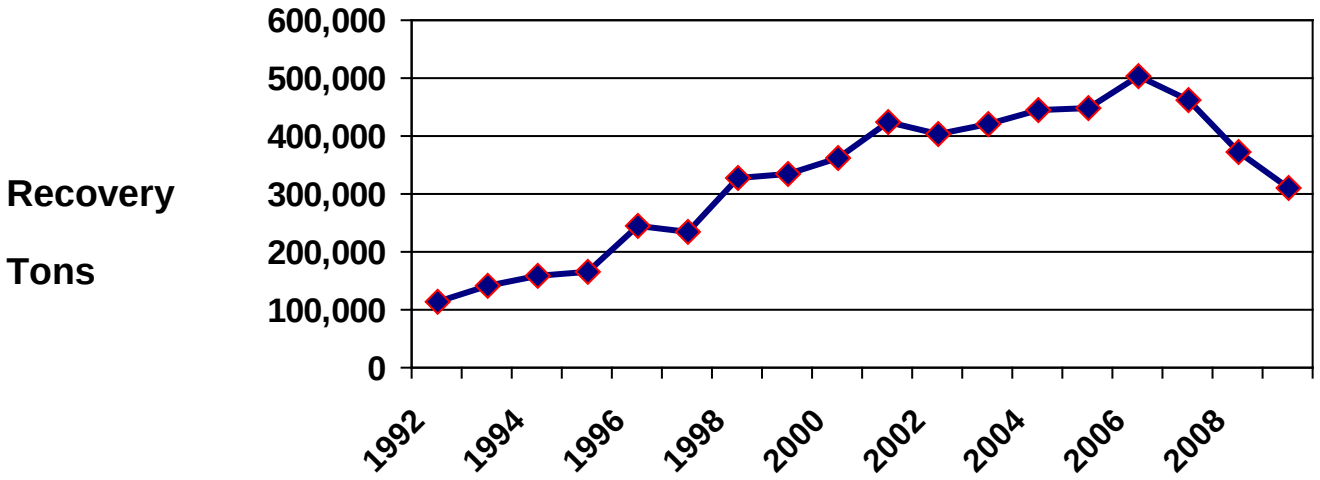
Yard Debris Recovery and Disposal Per Capita



Looking at the same results on a per-capita basis statewide shows that the amount of yard debris collected for composting increased strongly from 1993 through 2006, but that overall the decline in disposal was significantly less than the increase in collection. This partly could be due to people deciding to use the new yard debris collection programs, as opposed to the past, when they would just let yard debris remain on site or would find other things to do with yard debris, such as burning it.

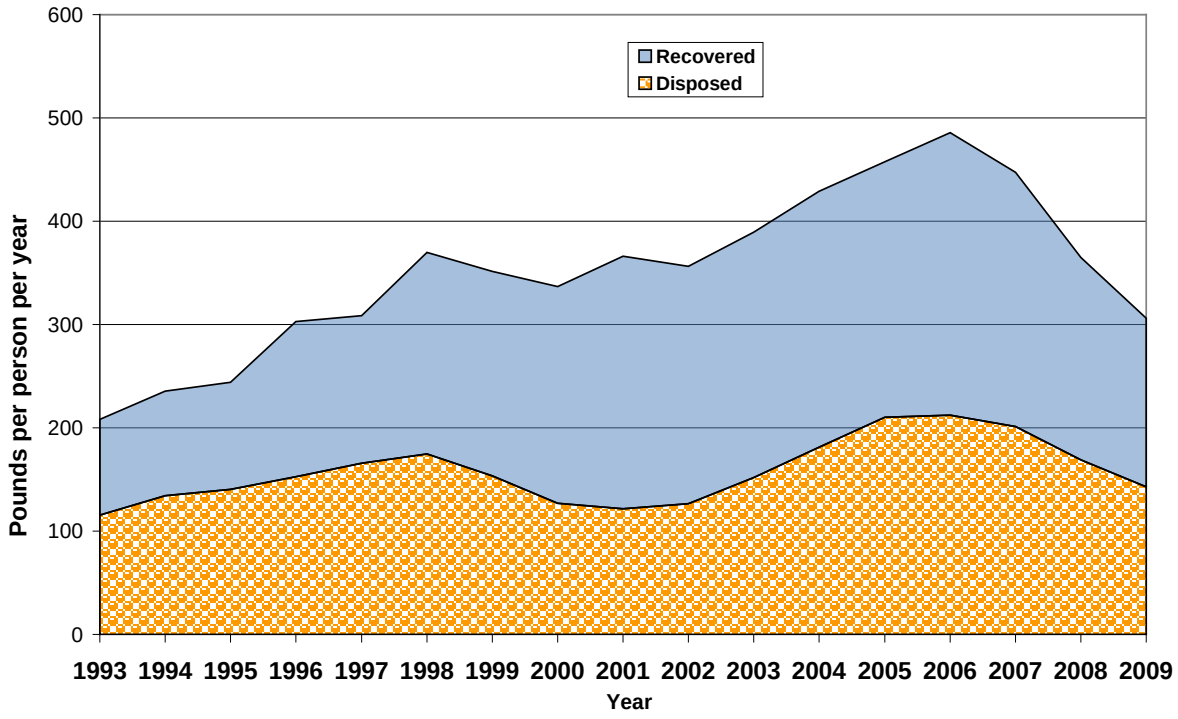
All Plastic: Percent of Disposed Wastestream and Recycling Tonnage

Disposal Composition Percentage	1993-95	1998	2000	2002	2005-06	2009-10
	9.09%	11.18%	8.81%	8.72%	13.57%	11.51%

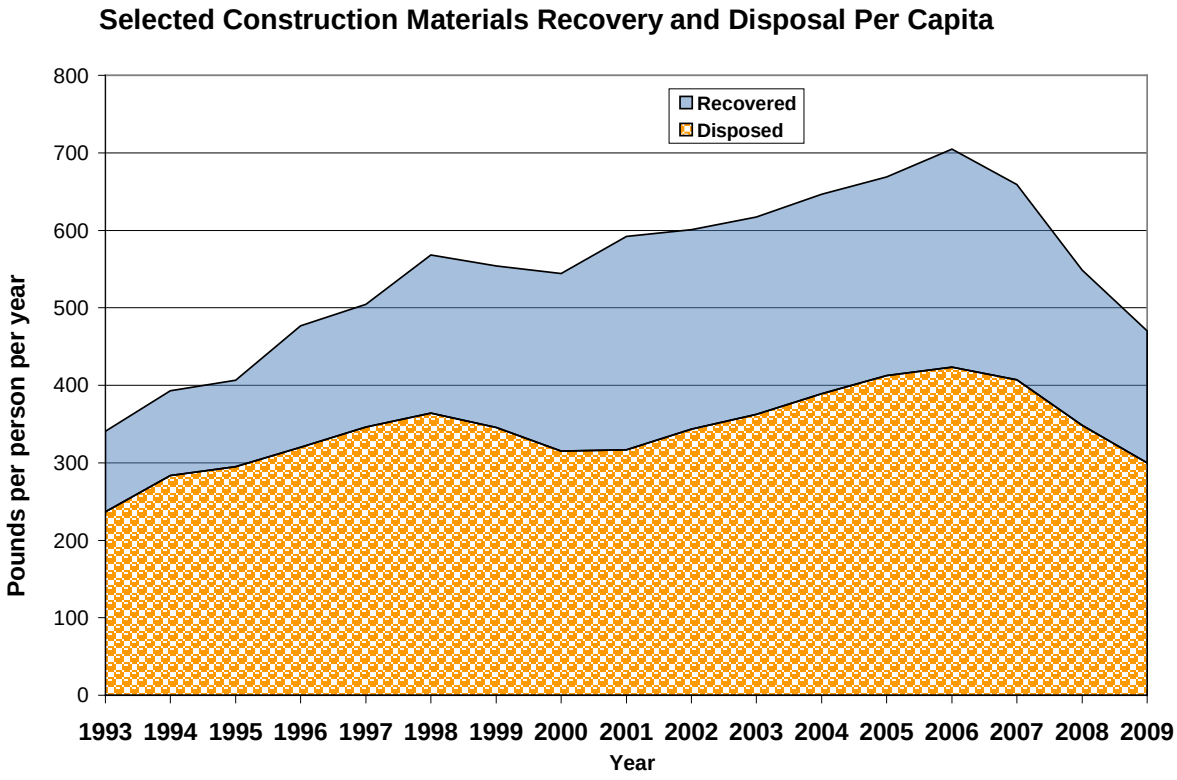


Wood waste recovery also increased substantially from 1992 through 2006. Most collected wood is ground into "hogged fuel" to be burned in large industrial boilers such as those used in paper mills. However, disposal of wood has not gone down overall, but instead has varied erratically. The strong drop in wood recovery starting in 2007 is clearly related to a downturn in the construction market due to the recession.

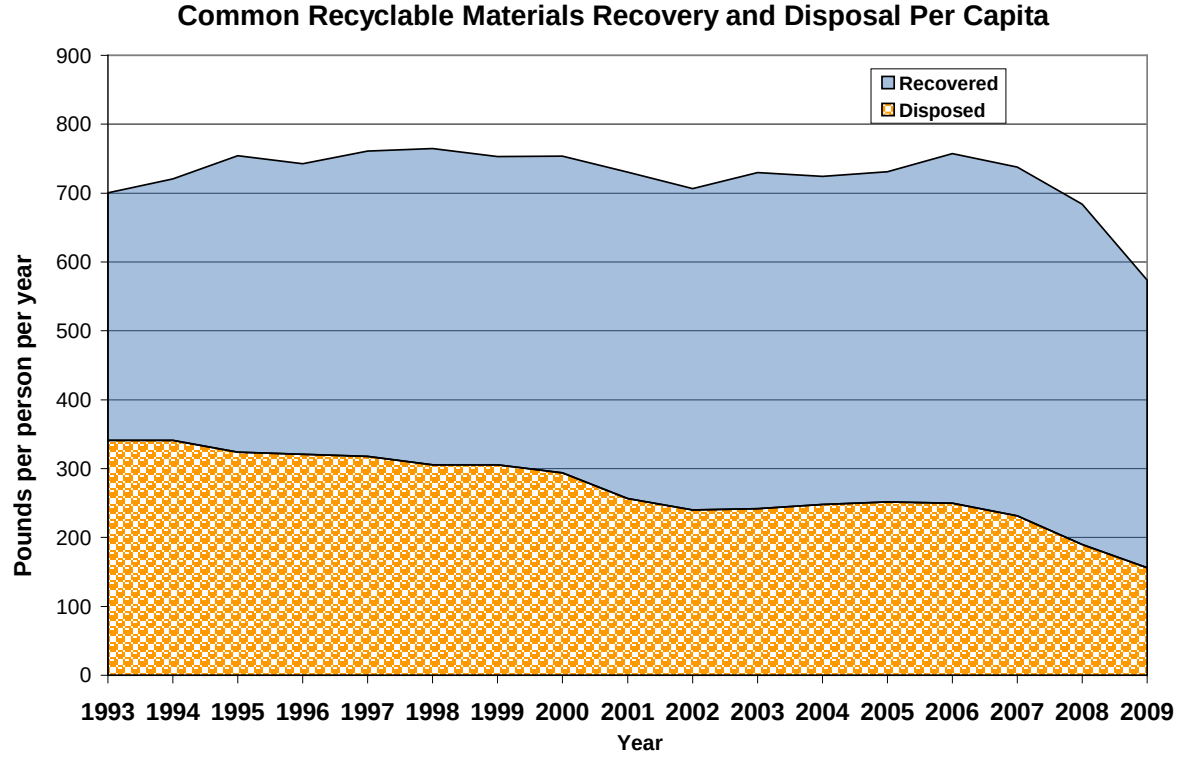
Wood Recovery and Disposal Per Capita



More wood and construction debris is generated from demolition and remodeling than from new construction. Looking at wood disposal and recovery on a per-capita basis, the increased generation of wood from 1993 through 2006 has been substantial. Again, though, this may partly be due to changes in the way people manage wood, with more wood in the past being burned in open piles or cut to be used as firewood. Again, the strong drop in generation starting about 2007 is likely due mainly to the downturn in construction and demolition connected to poor economic conditions.



Putting many of these construction materials together in one grouping gives similar results to some of the larger individual materials. Generation increases strongly through 2006, although some of this might be due to changes in how people managed materials in the earlier years. The decline in construction material generation starting in 2007 seems most closely related to the decline in construction.



This graph (previous page) looks at all the common recyclable material combined: recyclable paper, glass, rigid plastic containers, aluminum, and tinned cans. The results show that generation of these materials combined was almost constant on a per-capita basis from 1993 through 2007, but that during this period, disposal declined while recovery increased by the equivalent amount. Starting in 2007, total generation sharply declined. As discussed earlier, this is probably mainly due to decreases in printing of newspapers and magazines, and also a decline in packaging materials use (such as cardboard) due to poor economic conditions

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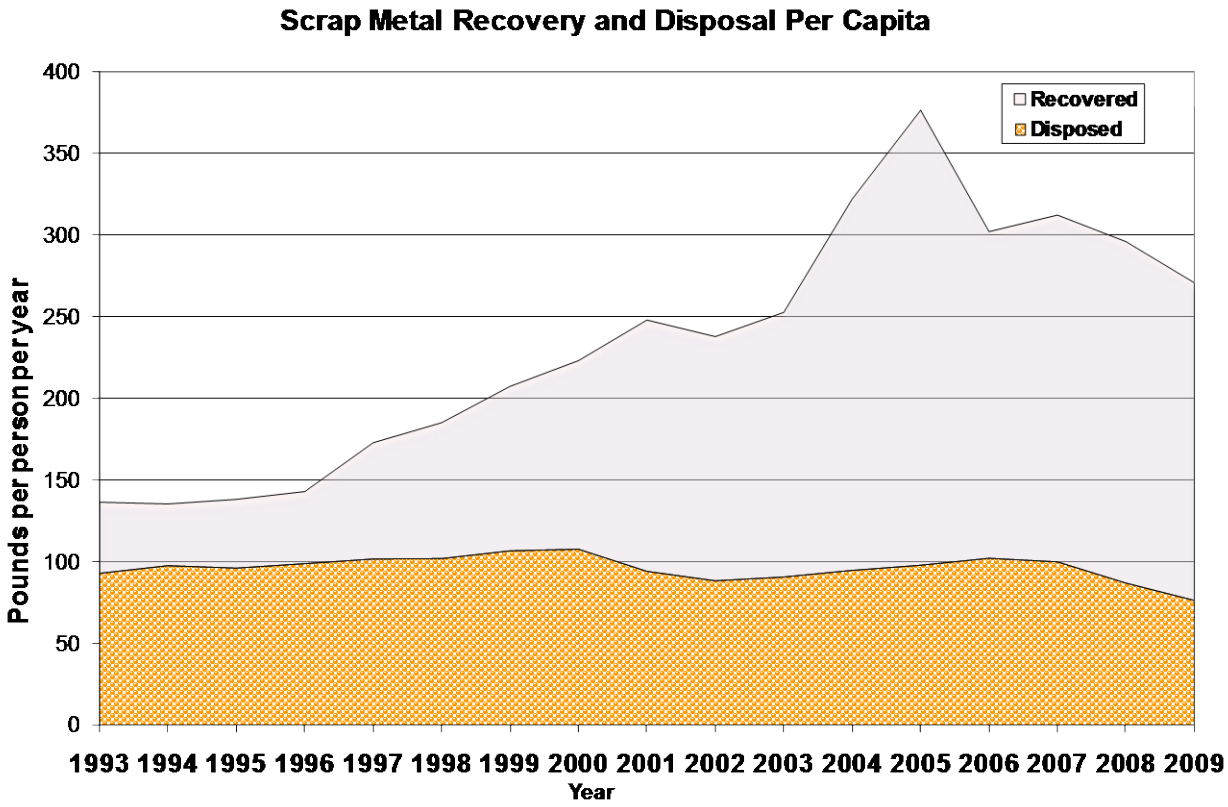


The disposal data for scrap metal here should be accurate, but the recovery numbers for scrap metal are poor quality and should not be used. Although most recyclers are required by law to report the material they recover each year, scrap metal dealers are required to report only materials from residential sources and disposal-related programs. In the early years (1990s), that is all they reported, but in later years they evidently began reporting commercial and perhaps industrial scrap metal too. Thus, the strong increase in metal recycling numbers is likely not real but reflects instead changes in reporting practices by scrap metal dealers. These issues are limited just to scrap metals and do not affect the reported recovery tons of the other materials.

Computers Disposed 1998 to 2009

Percent of Wastestream and 90% Confidence Intervals

(field data only)

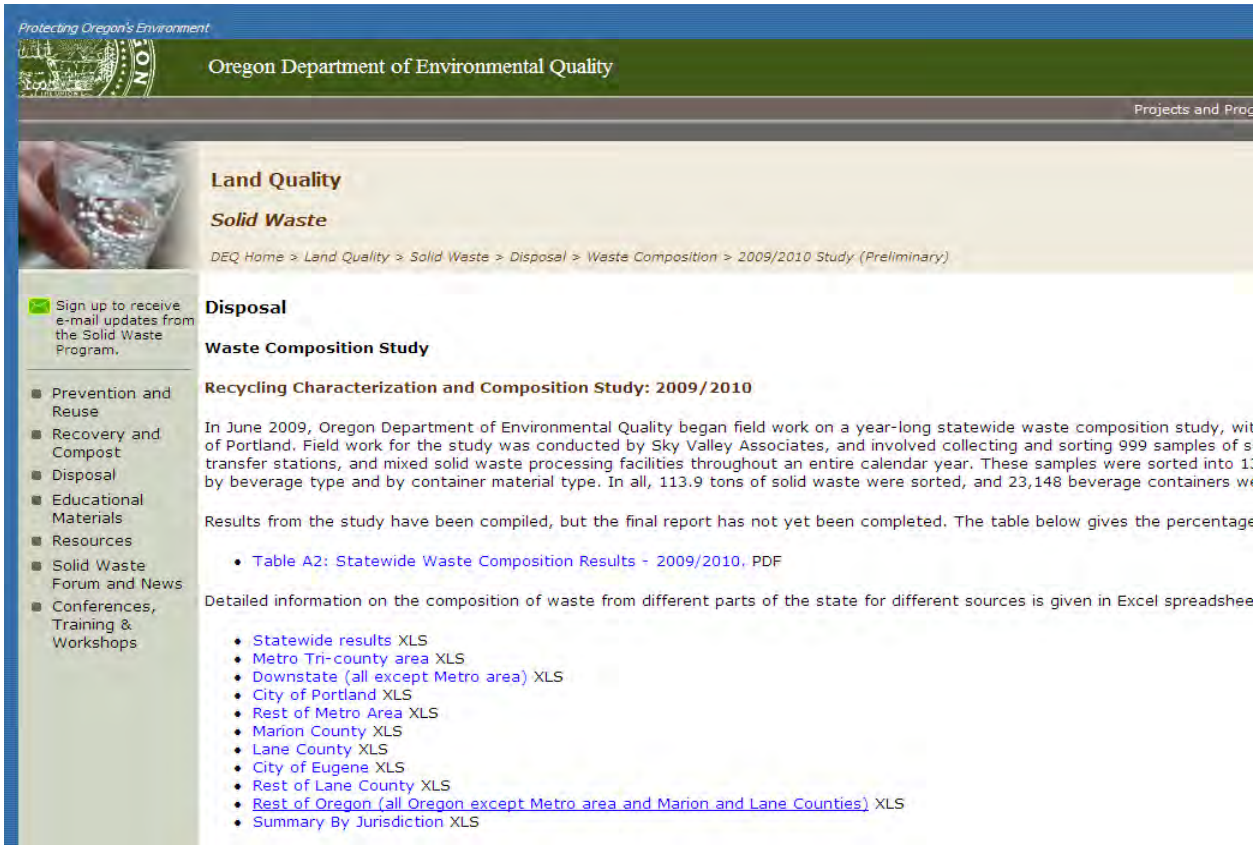
Year	Percent	90% Confidence Interval
1998	0.25%	0.13% to 0.37%
2000	0.68%	0.43% to 0.99%
2002	0.57%	0.35% to 0.83%
2005-2006	0.67%	0.41% to 0.98%
2009-2010	0.18%	0.08% to 0.30%

Computers increased quickly in the waste stream in the late 1990s. Implementation of computer and television take-back programs in Oregon in 2009 and before, coupled with a statewide disposal ban that began in 2010 in the middle of the waste composition study, has greatly reduced the landfilling of these covered electronic devices.

Summary Categories Disposed 2009-10

Group	**Field %**	**Corrected**
Food	16.99%	17.62%
Products	52.50%	48.40%
Packaging	18.40%	15.70%
Non-manufactured	12.21%	12.38%
Recoverable excluding compostable-only	37.10%	34.70%
Compostable-only – not recyclable	27.40%	25.80%
Not Recoverable	35.50%	33.70%
Organic (burnable)	79.80%	73.80%
Inorganic	20.20%	20.30%
(water & residue for all 3)	---	5.90%

This table summarizes disposal by major groupings of categories for the 2009-10 waste composition study. There is substantially more products in the disposed waste stream than packaging. Substantial amount of recyclable and compostable materials are still being disposed. There's still substantial energy in disposed waste, although some of those materials would not make good fuels. "Recoverable" refers to materials that have well-developed options for being recycled, burned as a legitimate fuel, or composted.



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Oregon Department of Environmental Quality

Projects and Prog

Land Quality

Solid Waste

DEQ Home > Land Quality > Solid Waste > Disposal > Waste Composition > 2009/2010 Study (Preliminary)

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Disposal

Waste Composition Study

Recycling Characterization and Composition Study: 2009/2010

In June 2009, Oregon Department of Environmental Quality began field work on a year-long statewide waste composition study, wit of Portland. Field work for the study was conducted by Sky Valley Associates, and involved collecting and sorting 999 samples of s transfer stations, and mixed solid waste processing facilities throughout an entire calendar year. These samples were sorted into 1 by beverage type and by container material type. In all, 113.9 tons of solid waste were sorted, and 23,148 beverage containers w

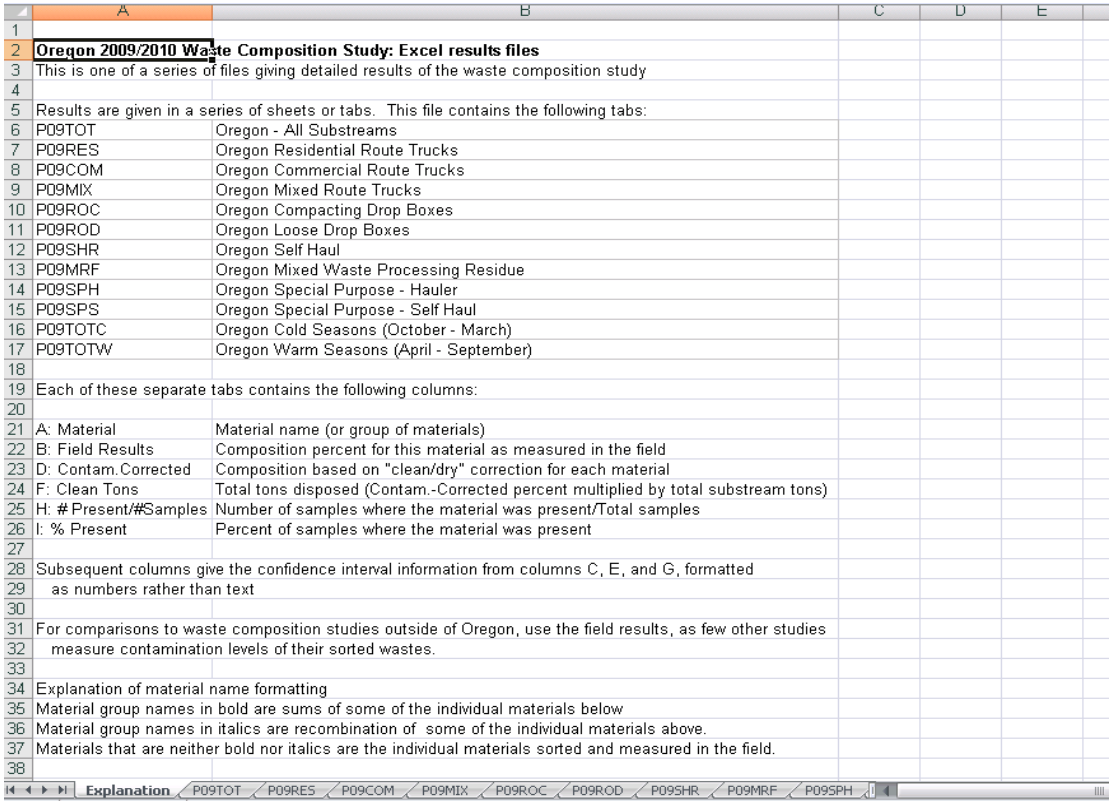
Results from the study have been compiled, but the final report has not yet been completed. The table below gives the percentage

- Table A2: Statewide Waste Composition Results - 2009/2010, PDF

Detailed information on the composition of waste from different parts of the state for different sources is given in Excel spreadshee

- Statewide results XLS
- Metro Tri-county area XLS
- Downstate (all except Metro area) XLS
- City of Portland XLS
- Rest of Metro Area XLS
- Marion County XLS
- Lane County XLS
- City of Eugene XLS
- Rest of Lane County XLS
- Rest of Oregon (all Oregon except Metro area and Marion and Lane Counties) XLS
- Summary By Jurisdiction XLS

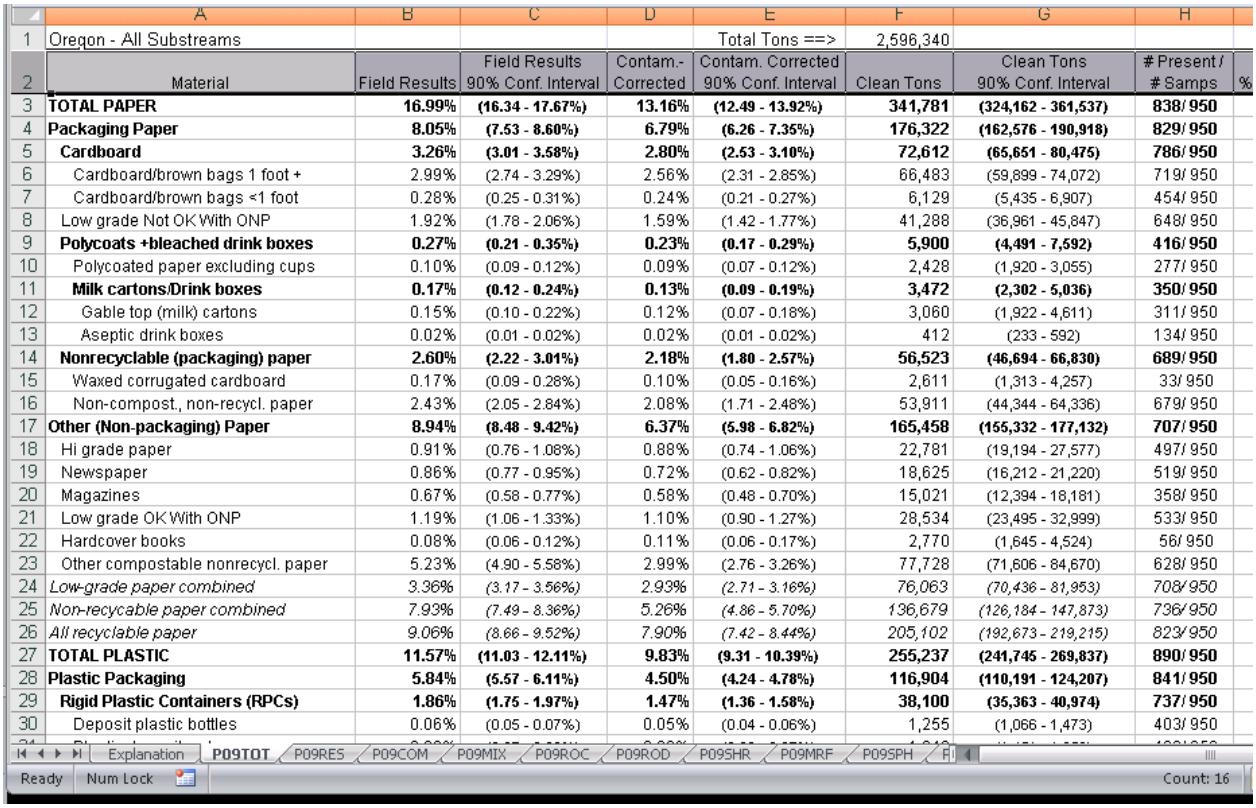
Detailed information on disposal of individual materials is available on the DEQ website at http://www.deq.state.or.us/lq/sw/disposal/wastecompstudy2009.htm, in a series of Excel files.



	A	B	C	D	E
1					
2	**Oregon 2009/2010 Waste Composition Study: Excel results files**				
3	This is one of a series of files giving detailed results of the waste composition study				
4					
5	Results are given in a series of sheets or tabs. This file contains the following tabs:				
6	P09TOT	Oregon - All Substreams			
7	P09RES	Oregon Residential Route Trucks			
8	P09COM	Oregon Commercial Route Trucks			
9	P09MIX	Oregon Mixed Route Trucks			
10	P09ROC	Oregon Compacting Drop Boxes			
11	P09ROD	Oregon Loose Drop Boxes			
12	P09SHR	Oregon Self Haul			
13	P09MRF	Oregon Mixed Waste Processing Residue			
14	P09SPH	Oregon Special Purpose - Hauler			
15	P09SPS	Oregon Special Purpose - Self Haul			
16	P09TOTC	Oregon Cold Seasons (October - March)			
17	P09TOTW	Oregon Warm Seasons (April - September)			
18					
19	Each of these separate tabs contains the following columns:				
20					
21	A: Material	Material name (or group of materials)			
22	B: Field Results	Composition percent for this material as measured in the field			
23	D: Contam.Corrected	Composition based on "clean/dry" correction for each material			
24	F: Clean Tons	Total tons disposed (Contam.-Corrected percent multiplied by total substream tons)			
25	H: # Present/#Samples	Number of samples where the material was present/Total samples			
26	I: % Present	Percent of samples where the material was present			
27					
28	Subsequent columns give the confidence interval information from columns C, E, and G, formatted				
29	as numbers rather than text				
30					
31	For comparisons to waste composition studies outside of Oregon, use the field results, as few other studies				
32	measure contamination levels of their sorted wastes.				
33					
34	Explanation of material name formatting				
35	Material group names in bold are sums of some of the individual materials below				
36	Material group names in italics are recombination of some of the individual materials above.				
37	Materials that are neither bold nor italics are the individual materials sorted and measured in the field.				
38					

Explanation | P09TOT | P09RES | P09COM | P09MIX | P09ROC | P09ROD | P09SHR | P09MRF | P09SPH

Each file has a similar format, with the first tab of each file being an explanation of what is in that file. The subsequent tabs give results for specific waste substreams within the geographic area covered by the file.



	A	B	C	D	E	F	G	H
1	Oregon - All Substreams				Total Tons ==>	2,596,340		
2	Material	Field Results	Field Results 90% Conf. Interval	Contam.-Corrected	Contam. Corrected 90% Conf. Interval	Clean Tons	Clean Tons 90% Conf. Interval	# Present / # Samps
3	**TOTAL PAPER**	**16.99%**	**(16.34 - 17.67%)**	**13.16%**	**(12.49 - 13.92%)**	**341,781**	**(324,162 - 361,537)**	**838/ 950**
4	**Packaging Paper**	**8.05%**	**(7.53 - 8.60%)**	**6.79%**	**(6.26 - 7.35%)**	**176,322**	**(162,576 - 190,918)**	**829/ 950**
5	**Cardboard**	**3.26%**	**(3.01 - 3.58%)**	**2.80%**	**(2.53 - 3.10%)**	**72,612**	**(65,651 - 80,475)**	**786/ 950**
6	Cardboard/brown bags 1 foot +	2.99%	(2.74 - 3.29%)	2.56%	(2.31 - 2.85%)	66,483	(59,899 - 74,072)	719/ 950
7	Cardboard/brown bags <1 foot	0.28%	(0.25 - 0.31%)	0.24%	(0.21 - 0.27%)	6,129	(5,435 - 6,907)	454/ 950
8	Low grade Not OK With ONP	1.92%	(1.78 - 2.06%)	1.59%	(1.42 - 1.77%)	41,288	(36,961 - 45,847)	648/ 950
9	**Polycoats +bleached drink boxes**	**0.27%**	**(0.21 - 0.35%)**	**0.23%**	**(0.17 - 0.29%)**	**5,900**	**(4,491 - 7,592)**	**416/ 950**
10	Polycoated paper excluding cups	0.10%	(0.09 - 0.12%)	0.09%	(0.07 - 0.12%)	2,428	(1,920 - 3,055)	277/ 950
11	**Milk cartons/Drink boxes**	**0.17%**	**(0.12 - 0.24%)**	**0.13%**	**(0.09 - 0.19%)**	**3,472**	**(2,302 - 5,036)**	**350/ 950**
12	Gable top (milk) cartons	0.15%	(0.10 - 0.22%)	0.12%	(0.07 - 0.18%)	3,060	(1,922 - 4,611)	311/ 950
13	Aseptic drink boxes	0.02%	(0.01 - 0.02%)	0.02%	(0.01 - 0.02%)	412	(233 - 592)	134/ 950
14	**Nonrecyclable (packaging) paper**	**2.60%**	**(2.22 - 3.01%)**	**2.18%**	**(1.80 - 2.57%)**	**56,523**	**(46,694 - 66,830)**	**689/ 950**
15	Waxed corrugated cardboard	0.17%	(0.09 - 0.28%)	0.10%	(0.05 - 0.16%)	2,611	(1,313 - 4,257)	33/ 950
16	Non-compost., non-recycl. paper	2.43%	(2.05 - 2.84%)	2.08%	(1.71 - 2.48%)	53,911	(44,344 - 64,336)	679/ 950
17	**Other (Non-packaging) Paper**	**8.94%**	**(8.48 - 9.42%)**	**6.37%**	**(5.98 - 6.82%)**	**165,458**	**(155,332 - 177,132)**	**707/ 950**
18	Hi grade paper	0.91%	(0.76 - 1.08%)	0.88%	(0.74 - 1.06%)	22,781	(19,194 - 27,577)	497/ 950
19	Newspaper	0.86%	(0.77 - 0.95%)	0.72%	(0.62 - 0.82%)	18,625	(16,212 - 21,220)	519/ 950
20	Magazines	0.67%	(0.58 - 0.77%)	0.58%	(0.48 - 0.70%)	15,021	(12,394 - 18,181)	358/ 950
21	Low grade OK With ONP	1.19%	(1.06 - 1.33%)	1.10%	(0.90 - 1.27%)	28,534	(23,495 - 32,999)	533/ 950
22	Hardcover books	0.08%	(0.06 - 0.12%)	0.11%	(0.06 - 0.17%)	2,770	(1,645 - 4,524)	56/ 950
23	Other compostable nonrecycl. paper	5.23%	(4.90 - 5.58%)	2.99%	(2.76 - 3.26%)	77,728	(71,606 - 84,670)	628/ 950
24	*Low-grade paper combined*	*3.36%*	*(3.17 - 3.56%)*	*2.93%*	*(2.71 - 3.16%)*	*76,063*	*(70,436 - 81,953)*	*708/ 950*
25	*Non-recycable paper combined*	*7.93%*	*(7.49 - 8.36%)*	*5.26%*	*(4.86 - 5.70%)*	*136,679*	*(126,184 - 147,873)*	*736/ 950*
26	*All recyclable paper*	*9.06%*	*(8.66 - 9.52%)*	*7.90%*	*(7.42 - 8.44%)*	*205,102*	*(192,673 - 219,215)*	*823/ 950*
27	**TOTAL PLASTIC**	**11.57%**	**(11.03 - 12.11%)**	**9.83%**	**(9.31 - 10.39%)**	**255,237**	**(241,745 - 269,837)**	**890/ 950**
28	**Plastic Packaging**	**5.84%**	**(5.57 - 6.11%)**	**4.50%**	**(4.24 - 4.78%)**	**116,904**	**(110,191 - 124,207)**	**841/ 950**
29	**Rigid Plastic Containers (RPCs)**	**1.86%**	**(1.75 - 1.97%)**	**1.47%**	**(1.36 - 1.58%)**	**38,100**	**(35,363 - 40,974)**	**737/ 950**
30	Deposit plastic bottles	0.06%	(0.05 - 0.07%)	0.05%	(0.04 - 0.06%)	1,255	(1,066 - 1,473)	403/ 950

Explanation | P09TOT | P09RES | P09COM | P09MIX | P09ROC | P09ROD | P09SHR | P09MRF | P09SPH

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The best results to use for figuring out the “clean / dry” percent of disposed materials is the “Contaminated Corrected” column D. Column F gives the same results, but in tons. To compare this study with other studies that do not estimate contamination correction factors, it is best to use column B – the field results.

Summary

- Waste generation, which had climbed steadily through 2006, declined sharply in 2008 and 2009.
- Tons disposed in 2010 are no higher than total tons disposed in 1996.
- Per-capita tons disposed in 2009 and 2010 are 10% lower than per-capita tons disposed in any other year since 1993.
- For traditional recyclables, from 1993 to 2007, total generation was flat, but Oregon steadily increased recovery and decreased disposal by more than 30% on a per-capita basis.
- Starting in 2007, total generation of traditional recyclables decreased sharply, while the percent recycled remained about the same.
- Plastics have a low recovery rate compared to other traditional recyclables, but showed increasing generation and recycling through 2007. Potential for increased recovery.
- Construction wastes showed large increases in generation through 2006, but have fallen sharply since then.