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## Iowa Waste Management -- Iowa Environmental Issues Series

Iowa Association of Naturalists

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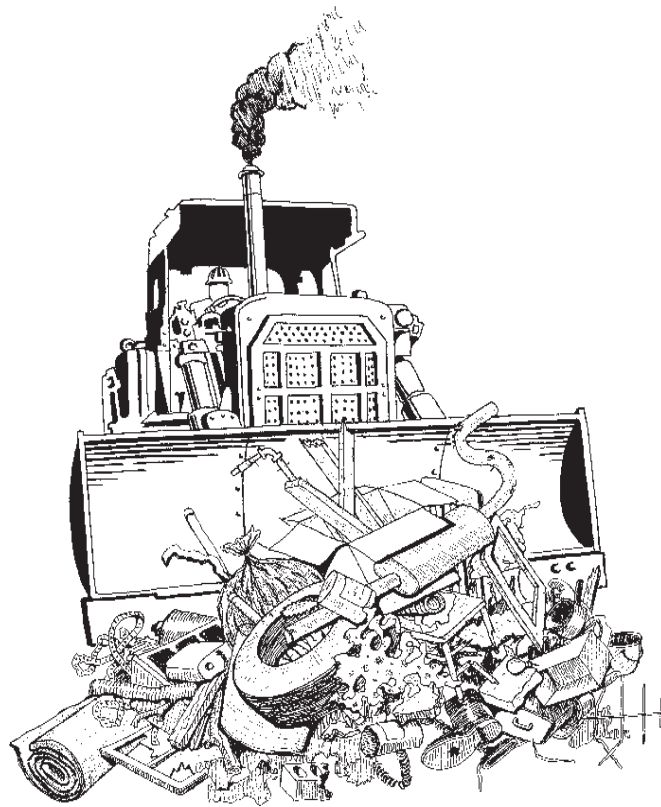
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# Iowa Waste Management

*Iowa Association of Naturalists*



**Iowa Environmental Issues Series**

# Iowa Waste Management

## Garbage: What a waste!

**W**hat's how Iowans used to refer to trash. But the age of new beliefs and behaviors has arrived. Garbage is out; recycling is in.

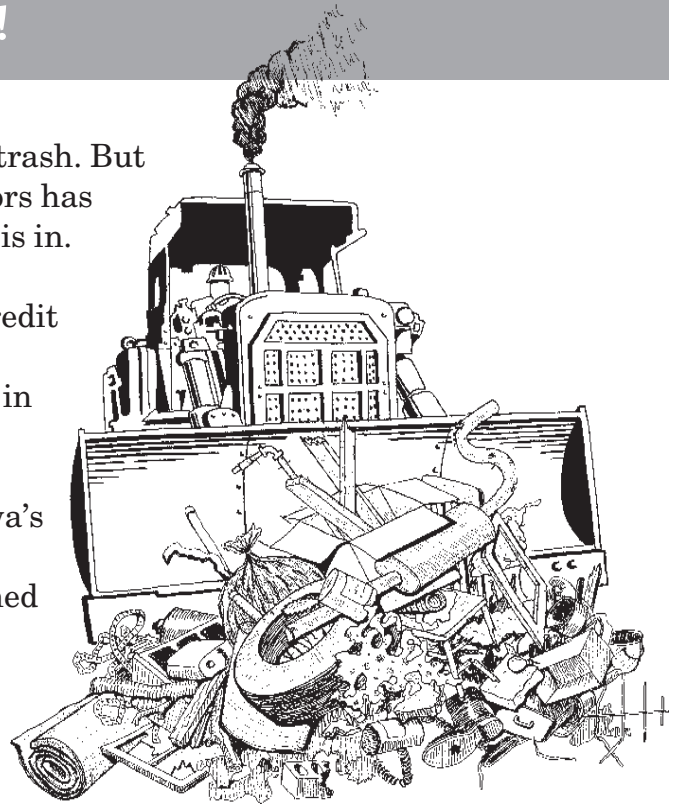
Drop-off and curbside recycling is common place, and green marketing is hot. Much credit for these changes goes to the passage of Iowa's Waste Reduction and Recycling Act in 1989.

This law initiated sweeping changes to Iowa's overall waste management systems. The changes were driven by two goals established in the law: to achieve 25 percent reduction of landfill waste by July 1, 1994 and, secondly, to achieve 50 percent reduction in landfill waste by July 1, 2000.

These goals were expected to be achieved through waste volume reduction at the source and recycling.

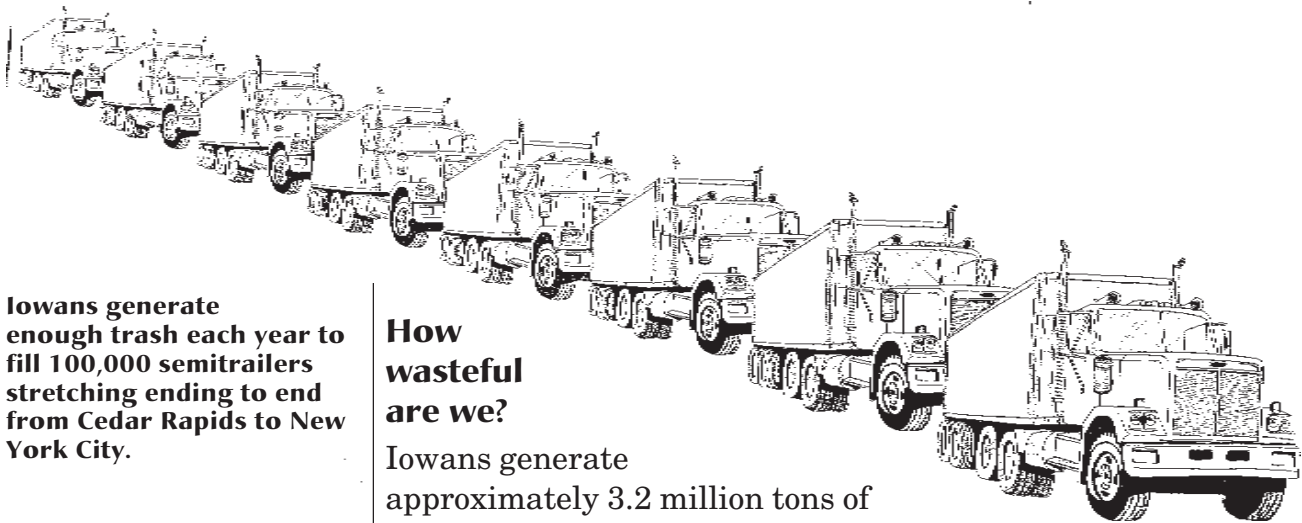
Iowa as a whole has met the 25 percent reduction goal. In fact, 1996 figures reported that the state's overall reduction level has reached 30 percent. In meeting this first goal, Iowa has established a significant recycling infrastructure that has changed forever how waste is managed in this state. However, as we will discuss, reaching the second goal will challenge even today's waste management gains. Iowans have both progress to celebrate and future strategies to develop.

This booklet will take a peek into Iowa's garbage pail, explore strands of the waste web, and highlight both pre-1989 and post-1989 approaches to waste management. Finally, the question. "Where do we go from here?" will be explored.



**At home, school, and work, Iowans generate approximately 3.5 pounds of garbage per person per day.**

Iowans generate enough trash each year to fill 100,000 semitrailers stretching end to end from Cedar Rapids to New York City.



**How wasteful are we?**

Iowans generate approximately 3.2 million tons of waste annually. Approximately two million tons of that is landfall each year. That's enough waste to fill 100,000 semitrailers stretching end to end, from Cedar Rapids, Iowa to New York City, New York. The contents of Iowa's wastestream include non-hazardous and hazardous residential, commercial, and industrial waste. Let's look more closely at each category according to a 1990 Iowa Department of Natural Resources (DNR) study

**Paper** (37.8 percent) made up the number one waste item, ranging from high grade office paper to tissues.

**Yard and food wastes** (26.8 percent, 15.3 percent total, and 11.5 percent, respectively) came in second. This category includes many compostable materials such as grass clippings, leaves, and kitchen scraps.

**Plastics** (6.8 percent) ranked a distant third by weight, but constituted 14 to 22 percent of the wastestream by volume and was rapidly increasing.

**Metal** (6.3 percent) included both ferrous (iron-based) metals found in food containers, tools, and appliances and non-ferrous metals such as aluminum and copper wire or zinc-coated piping.

**Rubber, leather, and textiles** (5.8 percent) came in the form of waste tires, shoes, clothing, and upholstery scrap.

**Glass** (4.8 percent) came in the form of beverage and food containers, blown glass, fiberglass, and window panes.

**Wood** (3.9 percent) came from construction, household tools, and large tree limbs.

**Remainder** (7.8 percent) was primarily sand left over from foundry casting operations.

While no statewide study has been completed since 1990, several regional waste composition studies were completed between 1992 and 1995. The studies detailed the variety of materials entering the state's landfills and designated their residential, commercial, and industrial streams. These details are very important as planners work on strategies to achieve the 50 percent reduction goal. The newer studies also provide information about gains made through waste reduction and recycling since 1989. These studies, however, should only be considered broad brush strokes painting a picture of Iowa's changing wastestream. Future studies, both statewide and regional, will continue to fill in the details about Iowa's wastebaskets.

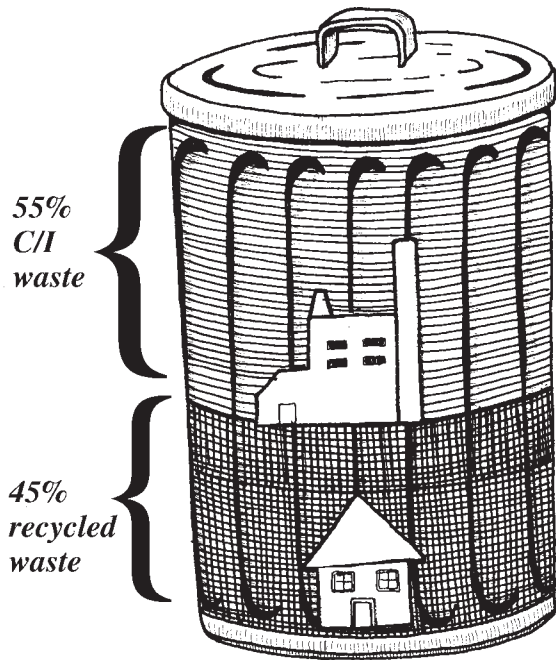
### **Residential**

Statewide, residential waste makes up approximately 45 percent of the landfall wastestream. Most reduction and recycling efforts have targeted the residential wastestream.

Studies by the Carroll County Solid Waste Commission, Scott County Solid Waste Commission, and Metro Waste Authority in Des Moines each confirm that paper remains the number one item in the state's wastestream. Food wastes and plastics consistently make up the next two largest components.

Textiles, metal, and glass are discarded less frequently. Yard waste was banned from landfill disposal after January 1991, and waste studies completed after the ban indicate that yard waste is greatly reduced at landfills across Iowa.

How is recycling affecting the residential wastestream? Recent data indicate recycling programs do have a significant impact on the quantity of recyclable paper delivered for landfill disposal. For example, before recycling programs were implemented, residential wastestreams contained two to four times the newsprint and more than twice the corrugated cardboard as was found in post-recycling wastestreams. Obviously, recycling programs reduce the percent of waste that ends up in our landfills.



### Commercial and Industrial

The types and quantities of materials in the commercial and industrial (C/I) wastestream have been found to be very similar to that of the residential wastestream. What makes this wastestream different is its volume. Fifty-five percent of our landfall waste comes from the C/I stream.

### Household hazardous materials (HHMs)

HHMs were not reported in the DNR's 1990 report, but they are included in newer studies. Each study reported HHMs as the smallest component of the residential wastestream, totaling less than one percent. Hazardous wastes that result from industrial processes

have also been reported to represent less than one percent of the C/I stream.

Between 1987 and 1997, Iowa law required the use of a HHM symbol on retail shelves as a way to increase consumer

awareness of these products. Due to lobbying pressures from the chemical industry, that requirement was dropped in 1997. DNR education about HHMs continues through Toxic Cleanup Days and HHM brochures that retailers are still required to make available. These products must be used, stored, and disposed properly in order to protect public health and the environment.

HHMs are products with at least one of the following characteristics:

**Reactive** – reacts violently with exposure to heat, pressure, or other chemicals  
(acids like toilet bowl cleaners)

**Corrosive** – damages other materials, including human tissue, on contact  
(battery acid, lye)

**Toxic** – poisonous and causing illness or death  
(antifreeze, cleaning products, pesticides)

**Flammable** – ignites easily  
(paint thinner, charcoal lighter)

Prior to the 1976 Federal

Resource Conservation and Recovery Act, there was very little regulation of hazardous wastes. Most of the hazardous waste sites in the U.S. are the result of disposal practices used as early as the 1940s and not discovered until after the 1970s.

In 1995, the DNR Hazardous Waste Site Registry reported 71 hazardous waste sites in 41 counties in the state. These sites include old coal gasification plants, tanneries, metal-plating facilities, pesticide and paint manufacturers, dry cleaners, and unregulated municipal and industrial dumps. Approximately 800 other sites have been reported and need further investigation. The threat these hazardous sites pose to drinking water supplies is not fully known. However, six of the sites have already caused serious contamination of city drinking water supplies, and five sites have contaminated private wells. The reality of the contamination should send a strong message about the need for proper handling and disposal of hazardous wastes.

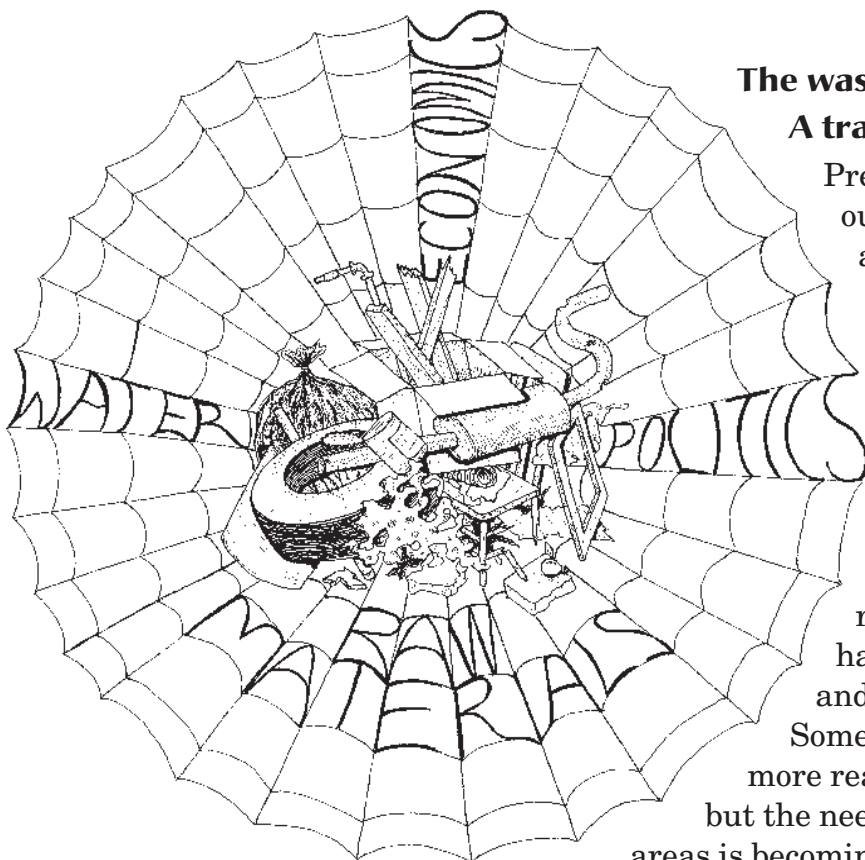
**Iowa households generate an estimated 15 pounds of HHMs per year – a total of 8,500 tons annually.**

**Beyond Iowa’s borders**

Iowa isn’t an island. States all across the U.S. are wrestling with waste management issues. While Iowans generate less than the national average of 4.4 pounds per person per day, the state’s 30 percent recycling rate is about average. In 1996, *Biocycle* magazine reported that some states are recycling 40 percent and more of their trash. Minnesota reports a 44 percent recycling rate, New Jersey reports 40 percent, and Washington reports 38 percent. At the other end of the spectrum are six states recycling less than ten percent of their waste. Wyoming is one such state with a recycling rate of only four percent.

Internationally, the U.S. leads its global neighbors in both waste generation and recycling. The U.S. generates more than twice as much waste per person per year as most other countries. This excessive waste generation may influence the drive to recycle. The 1996 U.S. recycling rate was reported to be 23 percent, while worldwide recycling rates range between two and 20 percent.

<b>International waste generation and recycling rates</b>		
(Source: USEPA-1996)		
<b>Country</b>	<b>Recycling rate</b> (as percent of waste generation)	<b>Waste generation</b> (lbs/person/month)
United States	23	135
Japan	20	81
United Kingdom	2	81
Germany	16	60



### The waste web:

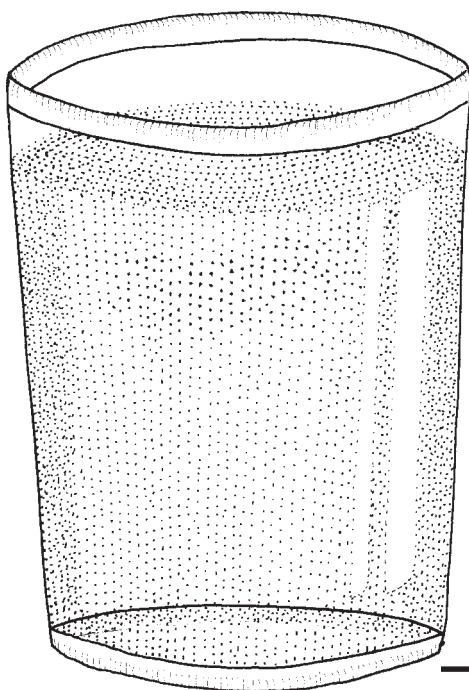
#### A trap or safety net?

Previously, we operated with an out-of-sight, out-of-mind attitude about our trash. Our behavior did not acknowledge the connections between our garbage, the environment, and the economy. Using our natural resources both for the materials to produce new goods and as a final resting place for our garbage has numerous environmental and economic consequences.

Some of those consequences are more readily measured than others, but the need to accurately address these areas is becoming increasingly urgent. Let's look at the strands of our waste web.

#### What shall we do to our water?

When you reach for a drink of water, do you think about the local landfill? Maybe you should. Rainwater and snowmelt that percolates through landfills can pick up toxins from buried trash. If this toxic brew - called **leachate** - reaches groundwater supplies, we could face a very serious situation, since approximately 80 percent of all Iowans depend on groundwater for their drinking supplies.



For protection, groundwater monitoring wells are now required at existing landfills. New landfill construction must include special liners and leachate collection and treatment systems. These new design and operating requirements for landfills are expensive, so we should be careful not to fill up our landfills any faster than absolutely necessary. That's one reason why waste reduction and recycling are so important.



### **Waste not, want not**

Natural resources are becoming increasingly limited and, consequently, more expensive. Manufacturing that depends upon new raw materials contributes to environmental disturbance extracting, shipping, and processing these materials. However, the price rarely reflects these costs. To simply throw these material resources “away” through landfilling is shortsighted and wasteful.

### **Political hot potato or public empowerment?**

The image of a national landfill crisis in the late 1980s served as a catalyst to push waste management into the national spotlight. As landfills in the eastern U.S. became “landfills,” the political potato of waste management heated up and many state reduction and recycling programs were initiated.

In many places, the temperature of the potato has cooled. The national landfill capacity crisis has subsided, waste management as a public policy issue has matured, and citizens have gained awareness and knowledge of the issue.

While the average remaining capacity of Iowa landfills is 12 years, some areas face a much shorter timeframe. These Iowa communities are exploring the tough process of answering “What’s next?” Wrestling with this question sheds new light on the complexities of dealing with our garbage and the high costs of our wasteful behavior. Siting new landfills, investing in alternative methods of disposal, and pursuing reduction and recycling goals elicit strong reactions as Iowa pushes beyond 25 percent toward 50 percent waste reduction. “Not-in-my-backyard” is often an easier response than “What can I do to change?” The potential for this political potato to heat up again exists, but so too does the opportunity for open, thoughtful debate that empowers citizen participation. Iowa leaders have a choice.

**Use of recycled aluminum rather than new aluminum in beverage packaging reduces energy, water use, and air pollution by 95 percent. Use of recycled glass rather than new glass in beverage packaging reduces water pollution by 50 percent, mining water by 79 percent, and air pollution by 14 percent.**

### **Linn County: Case Study**

Linn County's two landfills will reach capacity by the year 2002. The search for alternatives is already underway. A citizen focus group helped review a number of waste management technologies, including landfilling, recycling, composting, incineration, shipping waste out of the county, and bioreaction. Bioreaction is a low-tech composting design where a series of reusable, mini-landfills achieve approximately 60 percent waste reduction over a period of several years.

The group recommended developing additional landfill space, complemented by investigating innovative alternatives such as bioreaction. "One of the interesting results of the group's processing," notes Michael Berkshire with the Bluestem Solid Waste Agency in Cedar Rapids, "was the consensus that the county should take responsibility for their own waste. The group rejected the option of shipping waste out of county. Linn County citizens have developed an ownership of this issue due primarily to two things: financial incentive and education."

"First," Berkshire explained, "several communities have pay-as-you-go programs that charge per bag of non-recyclables. This fee gets people's attention. They see their personal interest in reducing waste. Secondly, as a solid waste agency, we value citizen participation and have built our planning around such input."

By the way, Linn County achieved 36 percent reduction in their landfall waste by 1996.

### **Economics or business as usual?**

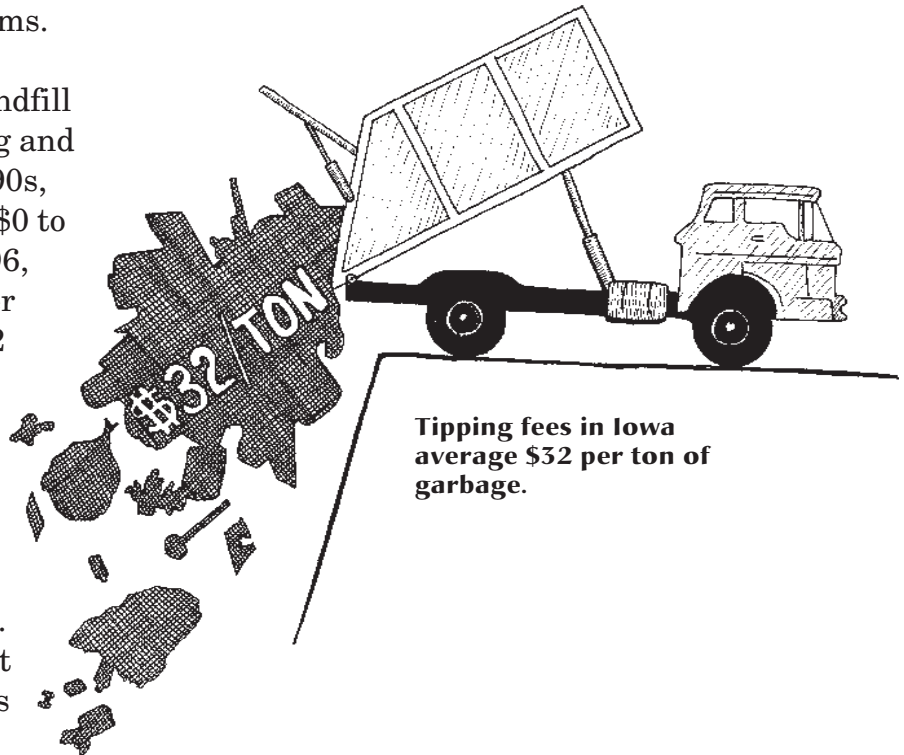
The word **economics** comes from the Greek roots "oikos"- *house* - and "nemein" - *to manage*. So economics relates to the management of a household. The economics of garbage relates to the management of natural resources in our global household.

When landfilling is used as the sole waste management strategy, garbage is kept out-of-sight and out-of-mind. But this strategy involves complex consequences in the form of polluted water, natural resource depletion, and land consumed for landfills. The introduction of comprehensive waste management planning changes the picture. New rules introduce new accountability. From landfill expenses to consumer budgets to business efficiency, there are new ways to understand the economics of waste.

At one time, a waste management budget may have accounted only for the fuel to run a bulldozer and the salary of the

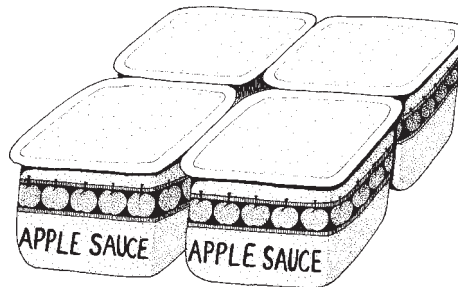
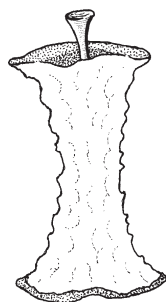
operator. Today, waste management budgets account for much more complex landfill maintenance, including daily covering of landfill material and water quality monitoring wells. Some waste management budgets even cover reduction and recycling programs.

The **tipping fee** paid at the landfill reflects the expense of handling and burying waste. In the early 1990s, Iowa tipping fees ranged from \$0 to \$35 per ton across Iowa. In 1996, they ranged from \$13 to \$60 per ton, with a state average of \$32 per ton. The highest U.S. tipping fee in 1996 was reported in New Jersey at \$79 per ton.



Food budgets offer another illustration of the cost of waste. According to 1988 figures, eight percent of the U.S. food bill was spent on packaging. At the same time, packaging is estimated to make up one-third of the wastestream. A comparison of apples and prepackaged apple sauce demonstrates how packaging effects both price and waste.

Product	Cost	Waste
1 pound of apples	\$0.60	4 compostable cores
4, 4 oz. single-service cups of applesauce	\$1.30	4 plastic containers, tear-off lids, and labeling



The perception of garbage as a problem rather than an opportunity underestimates the economic potential built into solving the problem. Paul Hawken's book *The Ecology of Commerce* argues for the potential of solving ecological and economic issues together. In Iowa, a number of programs are helping Iowa companies turn their waste problems into economic opportunity.

ReCycle Iowa! encourages market development for recyclable materials. ReCycle Iowa works as a liaison between the Iowa Department of Economic Development and the DNR. The DNR's Waste Reduction Assistance Program (WRAP) and Iowa Waste Reduction Center at the University of Northern Iowa help Iowa businesses find waste reduction solutions. The programs provide on-site reviews, recommendations, training where necessary, and follow-up technical assistance. Between 1990 and 1996, WRAP alone helped more than 160 businesses divert more than one million tons of waste from landfills saving \$40 million.

A fourth program, the By-product and Waste Search Service (BAWSS) administered by ReCycle Iowa, turns one company's waste into another's gold. BAWSS links waste generators with businesses that use the other company's by-products. Between 1990 and 1996, BAWSS professionals helped divert 169,540 tons of waste from landfills and saved businesses \$3.85 million in disposal costs.

We can choose business as usual and continue to pile up waste - both in economic and environmental terms. Or we can choose the path of economic opportunity and innovative manage our national and global household. Be it water, raw materials, politics, or economics, creativity and commitment will influence whether this is a web of supportive connection or entrapment.

### **Exchanging the magic waste wand**

The out-of-sight, out-of-mind approach to waste management practiced for so long has been much like a magician's now-you-see-it, now-you-don't trick. The myth that landfilling would make our waste disappear like magic began to die as the environmental movement grew during the 1970s, 1980s, and into the early 1990s. The turning points for public policy and public interactions occurred with the passage of the **Groundwater Protection Act** in 1987 and the **Waste Reduction and Recycling Act** in 1989. These innovative bills passed by the Iowa Legislature set the stage for sweeping changes in how we deal with our waste.

The 1987 Groundwater Protection Act mandated that landfill agencies develop comprehensive waste management plans using five prioritized waste management strategies:

- **Volume reduction at the source** - reducing the amount of waste before it enters the wastestream
- **Recycling and reuse** - recovering waste for reuse
- **Incineration with energy recovery** - burning waste to produce steam for electricity or heat
- **Incineration for volume reduction** - burning waste to reduce its volume
- **Sanitary landfills** - burying waste in the ground

The 1989 Waste Reduction and Recycling Act took waste management further by permanently eliminating certain waste items from landfill disposal and establishing waste reduction goals.

These two laws have challenged Iowa to move from simply landfilling its trash to implementing integrated waste management programs. The differences between pre-1989 and post-1989 waste management are striking.

**There is no "away" to throw things.**

## Criteria for critical shopping

Your shopping habits directly impact the amount and type of waste that must be managed. Apply these two recommended waste management strategies to your own shopping.

### Volume reduction at the source

Critique your shopping habits.

- *Do you really need this product? Can you borrow it from a friend, make it yourself, buy it used, or do without?*

Reject disposable products for more durable products.

Maintain what you have.

- *The life of a tire, for example, can be extended through proper inflation, balance, and regular rotation.*

Reject excessive packaging.

- *Few products need more than one or two layers of packaging. Buy large economy sizes for more efficient packaging.*

### Recycling and reuse

Support your community's programs.

- *If you aren't aware of your local recycling program, find out, use them, and promote them. Support them if they need help.*

Purchase products that your community recycles.

- *A product may be recyclable, but does your local program collect that particular material?*

Close the recycling loop.

- *Buying recycled is just as important as collecting recyclables. Manufacturers listen to consumers' demands for recyclable products. Stable prices and demand for recyclable materials helps support your recycling program.*

Compost yard and food waste.

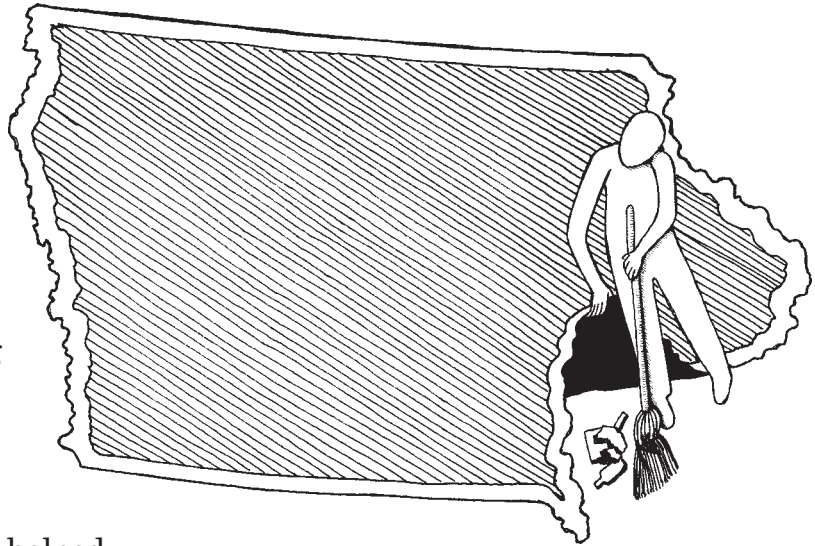
- *The natural process of decomposition reduces waste by recycling valuable nutrients. Some solid waste agencies have well-established compost programs. Or you may decide to set up your own home system.*

Good luck! Remember that being a critical shopper takes practice. Start today!

**Pre-1989**

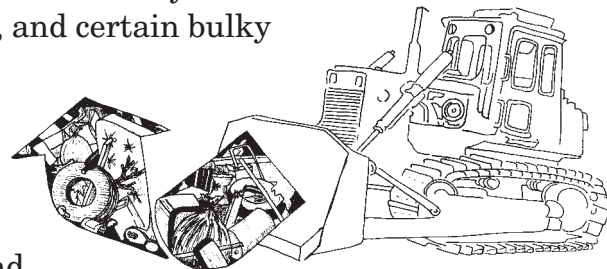
Statistics from the DNR show that Iowans depended almost solely on landfills for waste disposal prior to 1989. In 1988, there were 88 landfills in Iowa, no curbside recycling programs, and no composting programs. Commercial recycling activity was limited. The Iowa Bottle Bill, passed in 1979 as an anti-littering measure, laid the groundwork for the 1989 law.

Deposits on beverage containers helped reduce waste volume and introduced the practice of waste separation. But these were very small beginnings, and most of Iowa's garbage still ended up under the landscape.

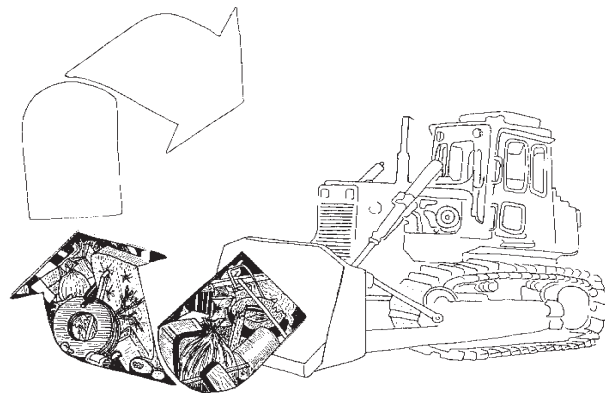


**Post-1989**

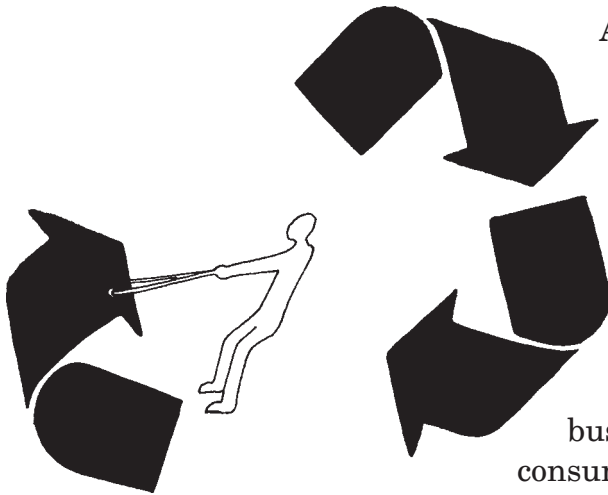
In retrospect, the 1989 legislation set off a firestorm of activity. Recycling programs - both curbside and drop-off - now serve 86 percent of the state's communities, and overall, Iowa has met the first goal to reduce landfills waste by 25 percent. Composting is a growing activity, and certain bulky and hazardous materials simply are not allowed to be dumped in landfills. Hazardous wastes are safely handled through a system of regional household hazardous material collection sites. A recycling infrastructure has been built, and financial and technical support programs assist these efforts.



But numbers don't tell the whole story. Public attitude and individual behaviors provide additional measures of progress. The 1989 law responded to public concern about the environment and concerned citizens have been involved in its implementation. This is



illustrated by the 35 planning areas that have met the 25 percent reduction goal. The success of reduction and recycling programs in these planning areas is the result of their investment in education through the media, public meetings, and advisory committees. Continued efforts to meet reduction and recycling goals will depend upon continued public involvement and support.



**Iowans have come a long way in pulling together to better manage their waste.**

Another measure of success is evident when consumers transfer the notion of recycling into action. Collecting recyclable materials is only one part of the recycling loop. Processing and purchasing recyclable materials are both needed to close the loop. While there's still a lot to accomplish here, industry and consumers are beginning to work together to close that loop. The number of recycled products for sale has risen sharply as the business community responds to changing consumer demands. Products from re-refined oil to clothing made from recycled materials are now available. Do you look for products with recycled content? If not, exercise your critical shopping skills and help pull that final loop into place.

You've come a long way from 1989, Iowa! Take a moment to congratulate yourself on the progress you've made. Then get ready to dig in for continued challenges.



## Iowa's Report Card

### Iowa Reduction and Recycling Progress Report 1989-1996

E — Excellent  
S — Satisfactory  
I — Improvement needed

#### Reduction

Landfill bans <i>(Yard waste, whole tires, used oil, and batteries are now banned from landfill disposal).</i>	E
Compost reported <i>(There are 62 compost sites in Iowa.)</i>	S
Number of landfills <i>(The number of landfills has dropped from 88 to 62. Landfill closings are primarily due to full capacity or unsafe sites).</i>	S
25 percent goal to reduce landfills waste by 1994. <i>(Figures from 1996 reported reduction at 30 percent).</i>	E
Toxic cleanup days <i>(Events have been held in 83 percent of Iowa counties.)</i>	E
Regional collection centers for household hazardous materials <i>(Five RCCs operate in Iowa, allowing for more consistent recovery of HHMs.)</i>	S

<b>Recycling</b>	
Curbside recycling programs <i>(A total of 540 Iowa communities have programs in place.)</i>	S
Drop-off recycling <i>(A total of 280 Iowa communities have drop-off sites.)</i>	S
Pay-as-you-waste programs <i>(A total of 150 Iowa communities use these programs as important recycling motivators.)</i>	I
<b>Support</b>	
Landfill alternatives grants <i>(Grants totaling \$25 million have been awarded to 195 projects to promote volume reduction at the source and landfilling alternatives.)</i>	E
WRAP (Waste Reduction and Assistance Program) <i>(By 1996, recommendations by WRAP staff to 160 businesses provided for waste diversion of one million tons and savings of \$40 million in disposable costs.)</i>	E
BAWSS (By-product and Waste Search Service) <i>(From 1990 to 1996, recommendations by BAWSS staff provided for the diversion of 169,540 tons of waste, saving businesses \$3.85 million in disposal costs.)</i>	E
University of Northern Iowa's Waste Reduction Service <i>(Small businesses receive technical assistance to redesign their systems for waste reduction.)</i>	E

**Economic Growth**

Jobs E  
*(A total of 1,290 new jobs were created in the recycling industry. For every job created in the Iowa recyclable materials processing sector, another job is created somewhere else in the Iowa economy.)*

Fiscal impact in Iowa E  
*(In 1995, new jobs and resulting products sales stimulated \$100.3 million in industrial sales.)*

Public funds collected E  
*(In 1995, \$6.3 million in fees and taxes were paid to state and local governments from recyclable materials processing activities.)*

**Comments**

Garbage is now serious business in Iowa. The pieces put in place in just seven years since legislation was passed have begun to transform how waste is managed in Iowa. The political commitment and individual action that have carried efforts so far will be even more important as Iowa reaches toward the 50 percent reduction goal by 2000.

**Where do we go from here?**

This question calls for pause. As we move from the 25 percent reduction goal to the 50 percent reduction goal, let's review the original intent of both the 1987 Groundwater Protection Act and the 1989 Waste Reduction and Recycling Act.

**A link for closing the recycling loop**

Buy Recycled, Iowa!  
Waste Management Assistance Division  
Iowa Department of Natural Resources  
900 E. Grand Ave.  
Des Moines, Iowa 50319                      515/281-4367

*A recycled-content products guide introduces more than 200 manufacturers and distributors - mostly from bedding, construction and renovation products, metal and miscellaneous products, pallets, drums, paper and plastic products, re-refined oil, tire and rubber products, and wood products.*

Concern for Iowa's groundwater changed our concept of landfills. Landfill changes led to waste management changes. Waste management changes touch life-style changes. And as those changes evolve, so too does our sensitivity to the implications. In summary, two rather basic strategies served as the backbone for achieving the 25 percent reduction goal - landfill bans and

development of residential recycling. The ban on yard waste alone pulled out approximately 15 percent of the pre-landfill wastestream. Introducing recycling first to the residential sector brought the issue into everyone's home and laid important groundwork for the next phase. The accomplishments made in achieving the 25 percent reduction goal are notable given Iowa's pre-1989 status. However, this is only the beginning if we take the intent of the laws seriously.

Iowa's landfills will continue to be part of the waste management answer, but they can no longer hold center stage. Integrated waste management involves a fundamentally different approach to our trash - from its generation to its disposal. The benefits include longer

**"Meeting the 25 percent goal was the warm-up," says retired legislator David Osterberg. "Striving for the 50 percent goal is going to be different. This will require an all-out effort.."**

landfill lifespans, reduced need to dump our trash in someone else's backyard, less pollution, and new jobs and businesses.

In reaching towards the 50 percent goal, the Iowa DNR will focus on

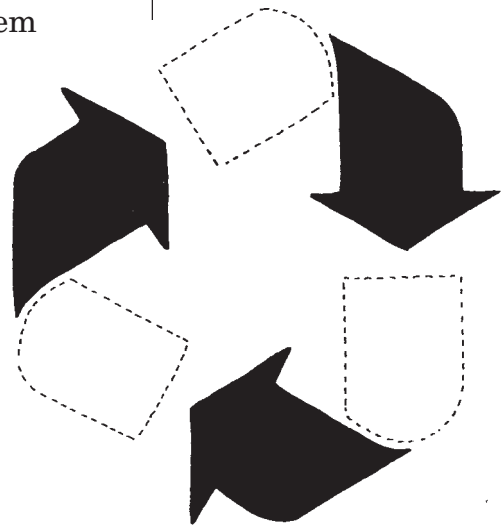
- composting for organic materials other than yard wastes,
- developing a recycling infrastructure for construction and demolition waste, and
- maximizing business and industry participation in recycling.

Consensus on waste reduction and recycling objectives is fragile as Iowa leaders confront efforts to meet the 50 percent reduction goal. Differences of opinion are becoming more apparent on issues of advisability, appropriate strategies, and changes needed in our waste management paradigm.

Asking "Where do we go from here?" encourages us to recognize that effective waste management goes beyond just dealing with waste once it's created. It demands more than legislative incentives and programs. It demands that we rethink how we use resources in the first place and how we can make significant changes in waste generation.

Automobile engineers, for example, are designing cars to be disassembled for recycling. This kind of problem-solving turns the issue of waste management upside down, revealing totally new solutions.

Achieving a fully-integrated waste management system calls for new, creative ways to incorporate waste reduction into our lives. In addition to intentional reduction efforts, recycling and composting must become integral components rather than just supplements to our integrated waste system. Moving along this journey will take time, evaluation of lessons learned, supportive public policy - and lots of creativity.



## Useful resources

### *Agencies*

#### **Iowa Department of Natural Resources (DNR)**

Waste Management Assistance Division, Wallace State Office Building  
900 E. Grand Ave., Des Moines, Iowa 50319-0034  
Phone: 515/281-4367; Fax: 515/281-8895

#### **ReCycle Iowa**

200 E. Grand Ave.  
Des Moines, Iowa 50309  
Phone: 515/242-4755; Fax: 515/242-4749

#### **Iowa Waste Reduction Center**

University of Northern Iowa  
5 Biology Research Complex  
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### *Publications*

**Waste Matters Newsletter;** Chris Cingrani, Editor, Waste Management Assistance Division, Iowa Department of Natural Resources, Des Moines, IA.

**Environmental Shopping;** Brochure, Waste Management Assistance Division, Iowa Department of Natural Resources, Des Moines, IA.

**Household Hazardous Waste Wheel;** Waste Management Assistance Division, Iowa Department of Natural Resources, Des Moines, IA. (\$1.25 ppd)

**Iowa's Clean SWEEP;** Curriculum; Iowa Department of Education, Des Moines, Iowa; 1992.

### *Videos*

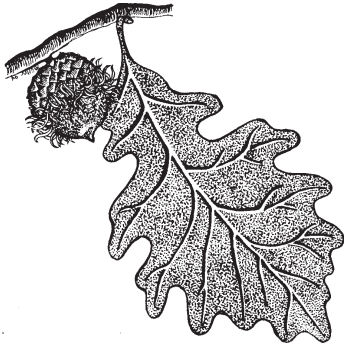
**The Rotten Truth;** Sunburst/Wings for Learning, 101 Castleton St., Pleasantville, NY, 10570,

1-800-321-7511. Available through Area Education Agencies Number 2, 10, and 11.)

**Sarah's Tree** (Grades K-5); Waste Assistance Division, Iowa Department of Natural Resources, Des Moines, IA.; 1992.

**Recycle Rachel** (Grades 6-12); Waste Assistance Division, Iowa Department of Natural Resources, Des Moines, IA.; 1992.

**Elliot Mess and the Case of Household Hazardous Wastes** (Grades 6 - adult); Waste Assistance Division, Iowa Department of Natural Resources, Des Moines, IA.; 1992.



## *Iowa Association of Naturalists*

The Iowa Association of Naturalists (IAN) is a nonprofit organization of people interested in promoting the development of skills and education within the art of interpreting the natural and cultural environment. IAN was founded in 1978 and may be contacted by writing the Conservation Education Center, 2473 160th Rd., Guthrie Center, IA 50115, 515/747-8383.

### **Iowa Environmental Issues Series**

In order to make wise decisions, people need a basic understanding of the factors involved in current environmental issues. They need to understand how their lifestyle is tied to these issues and how changes in lifestyle can impact the environment. The Iowa Association of Naturalists has created this series of booklets to offer a basic understandable overview of Iowa environmental issues. These booklets will assist educators in teaching students about topics that affect the Iowa environment. The seven booklets in this series are:

- Iowa Habitat Loss and Disappearing Wildlife (IAN-101)
- Iowa Air Pollution (IAN-102)
- Iowa Water Pollution (IAN-103)
- Iowa Agricultural Practices and the Environment (IAN-104)
- People, Communities, and Their Iowa Environment (IAN-105)
- Energy In Iowa (IAN-106)
- Iowa Waste Management (IAN-107)



The *Iowa Environmental Issues Series* is published by IAN with major funding from the REAP Conservation Education Board (September 1998).

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*Iowa Waste Management* is one in a series of seven booklets that are part of the *Iowa Environmental Issues Series*. The booklets in the series include:

### **Iowa Environmental Issues**

Iowa Habitat Loss and Disappearing Wildlife	(IAN-101)
Iowa Air Pollution	(IAN-102)
Iowa Water Pollution	(IAN-103)
Iowa Agricultural Practices and the Environment	(IAN-104)
People, Communities, and Their Iowa Environment	(IAN-105)
Energy In Iowa	(IAN-106)
Iowa Waste Management	(IAN-107)

The Iowa Association of Naturalists also has produced five other booklet series that provide readers with a clear, understandable overview of topics concerning the Iowa environment and conservation. The booklets included in each of the other five series are listed below.

### **Iowa Wildlife Series**

Iowa Mammals	(IAN-601)
Iowa Winter Birds	(IAN-602)
Iowa Nesting Birds	(IAN-603)
Iowa Reptiles and Amphibians	(IAN-604)
Iowa Fish	(IAN-605)
Iowa Insects and Other Invertebrates	(IAN-606)

### **Iowa's Natural Resource Heritage**

Changing Land Use and Values	(IAN 501)
Famous Iowa Conservationists	(IAN 502)
Iowa's Environmental Laws	(IAN 503)

### **Iowa Wildlife and People**

Iowa Wildlife Management	(IAN-401)
Keeping Iowa Wildlife Wild	(IAN-402)
Misconceptions About Iowa Wildlife	(IAN-403)
State Symbols of Iowa	(IAN-404)
Iowa Food Webs and Other Interrelationships	(IAN-405)
Natural Cycles In Iowa	(IAN-406)
Iowa Biodiversity	(IAN-407)
Adapting To Iowa	(IAN-408)

### **Iowa Plants**

Iowa's Spring Wildflowers	(IAN-301)
Iowa's Summer and Fall Wildflowers	(IAN-302)
Benefits and Dangers of Iowa Plants	(IAN-303)
Iowa's Trees	(IAN-304)
Seeds, Nuts, and Fruits of Iowa Plants	(IAN-305)
Iowa's Mushrooms and Other Nonflowering Plants	(IAN-306)
Iowa's Shrubs and Vines	(IAN-307)

### **Iowa's Biological Communities**

Iowa's Biological Communities	(IAN-201)
Iowa Woodlands	(IAN-202)
Iowa Prairies	(IAN-203)
Iowa Wetlands	(IAN-204)
Iowa Waterways	(IAN-205)

These booklets are available to download via PDF on the ISU Extension Store:

[store.extension.iastate.edu](http://store.extension.iastate.edu)

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