



# USEPA Education and Outreach Projects

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Outcomes from the Great Lakes  
Regional Collaboration

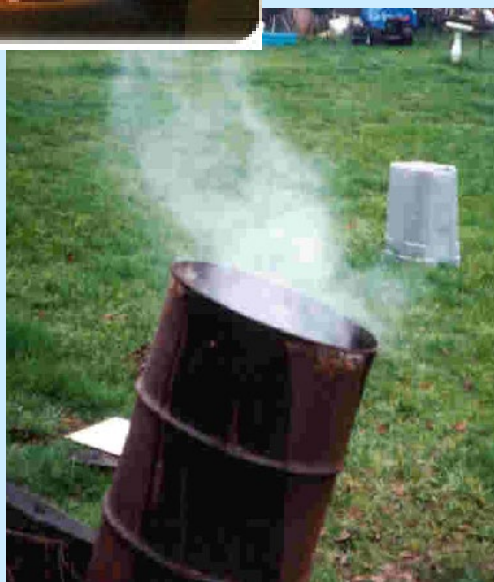
March 14, 2007

Erin Newman, Air Division  
Jessica Winter, Great Lakes Program  
Christopher Newman, Waste Division

# Learn Not to Burn



Reducing Backyard  
Burning  
of Household Waste



# What is Backyard Burning?

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Backyard burning (BYB) is the uncontrolled combustion of household waste in barrels, open pits, wood stoves, or fireplaces. (also known as burn barrels, open burning, or household trash burning)



# Why are we Concerned?

*BYB is used by an estimated 20 million Americans.*

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Some consider this an issue of the past.



But in reality, this is often a common practice in less urban areas of the U.S.

# Why are we Concerned?

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- Backyard burning causes accidental fires.
- Backyard burning releases toxic chemicals into environment that can cause adverse health impacts.
- Backyard burning is illegal in many places.

# 2003 Trash Fires in Illinois

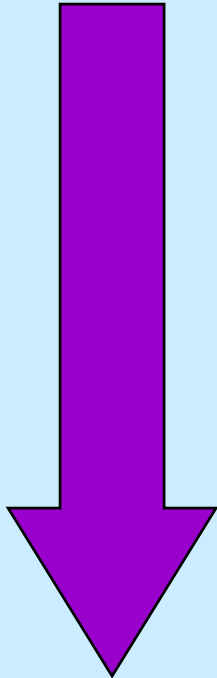
	<b>Number</b>	<b>Injuries</b>	<b>Property Loss (\$)</b>
<b>Outside rubbish, trash or waste fire</b>	1,601	1	34,756
<b>Other outside rubbish fire</b>	691	0	6,671
<b>Garbage dump or landfill fire</b>	21	0	0
<b>Construction or demolition landfill fire</b>	89	0	0
<b>Dumpster or outside trash receptacle fire</b>	1,043	1	50,800
<b>Outside stationary compactor trash fire</b>	10	0	1,000
<b>TOTAL</b>	<b>3,455</b>	<b>2</b>	<b>93,227</b>

Source: Illinois State Fire Marshal, 2004

# Release of Toxic Chemicals

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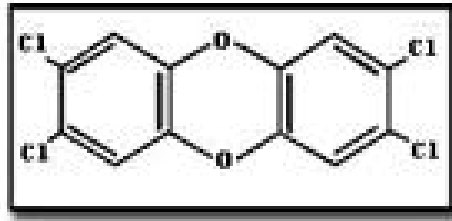
Direct Exposure  
(e.g. inhalation)



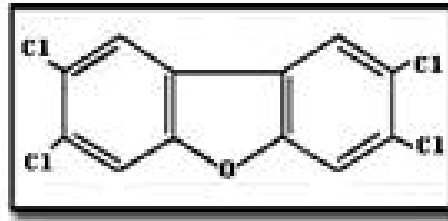
Indirect Exposure  
(e.g. bioaccumulation)

- Particulate Matter
- Sulfur Dioxide
- Carbon Monoxide
- PAHs
- Metals
- Hexachlorobenzene
- Dioxin

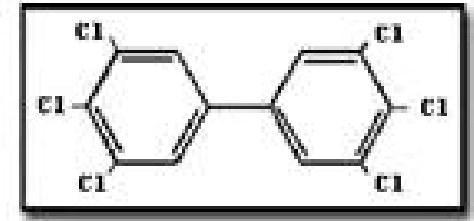
# Dioxin-like Chemicals



2,3,7,8-  
Tetrachlorodibenzo-p-dioxin



2,3,7,8-  
Tetrachlorodibenzofuran



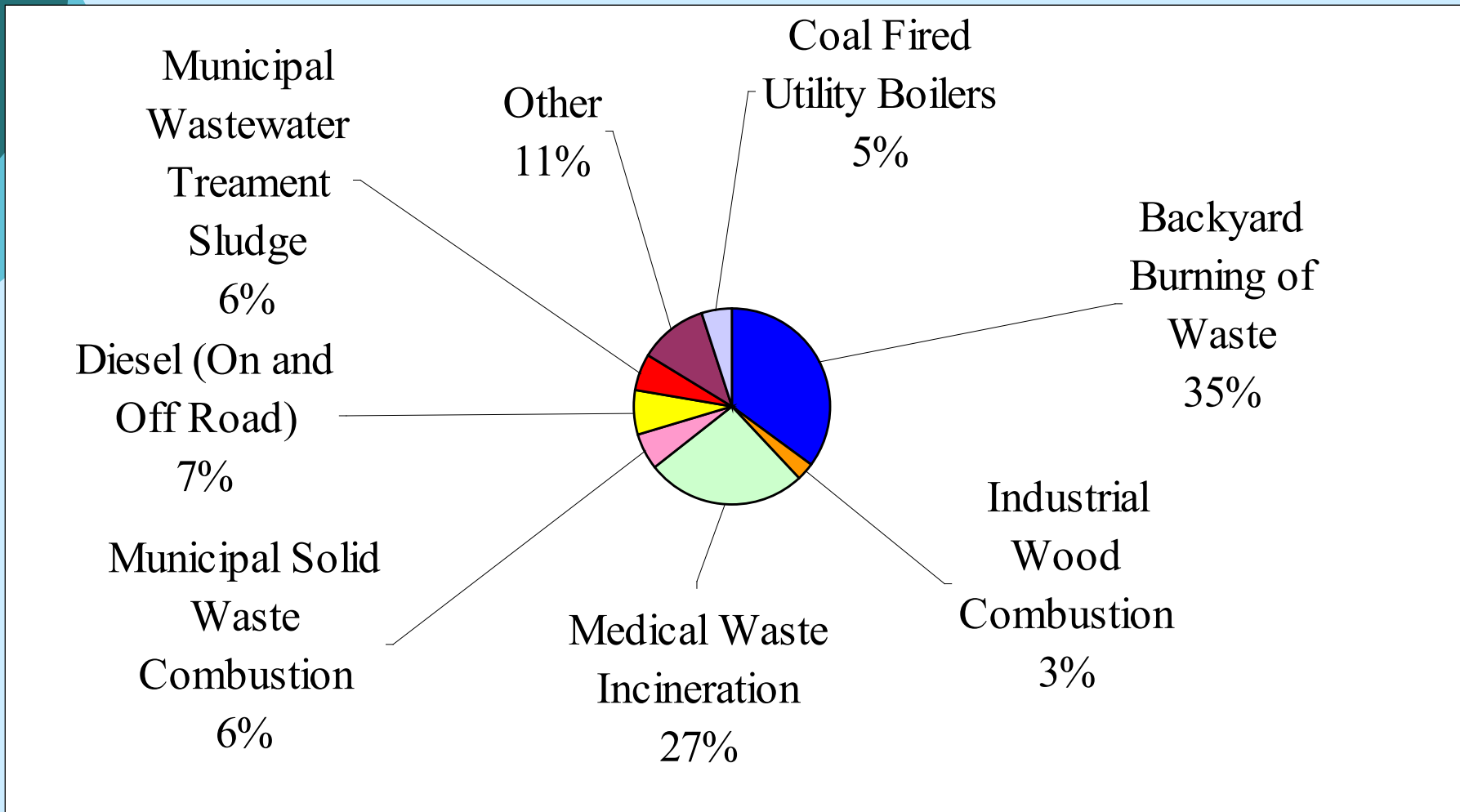
3,3',4,4',5,5'-  
Hexachlorobiphenyl

- There are 30 different Dioxin-like compounds.
- 2,3,7,8 TCDD is the most studied of the chemical class.
- EPA considers dioxins to be “potent animal toxicants” and “likely human carcinogens.”
- USHHS and IARC classify 2,3,7,8 TCDD as a human carcinogen.



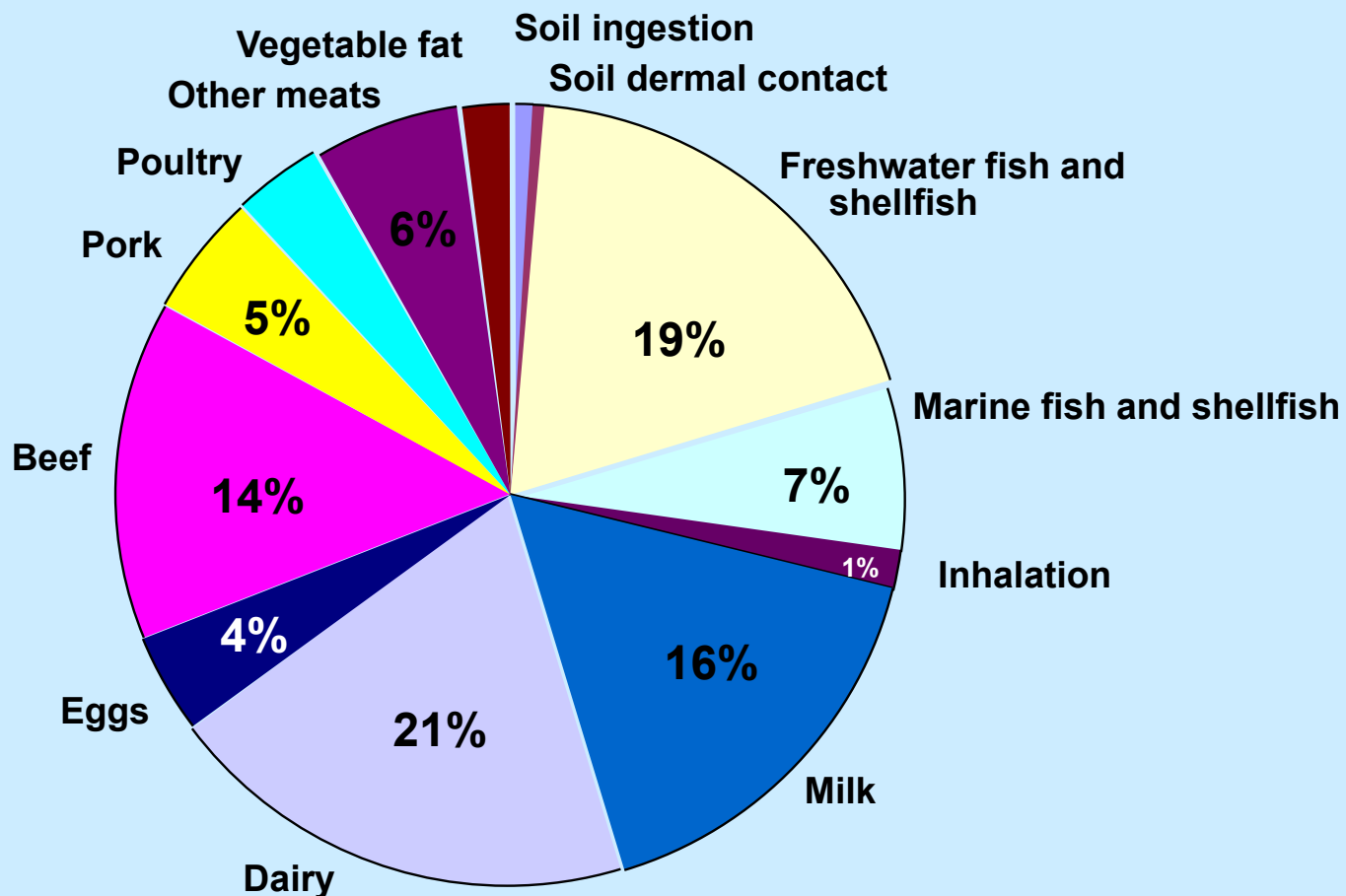
# U.S. Inventoried Dioxin Releases in 2000

Source: An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000, November 2006.



# Adult Average Daily Intake of CDDs/CDFs/Dioxin-like PCBs

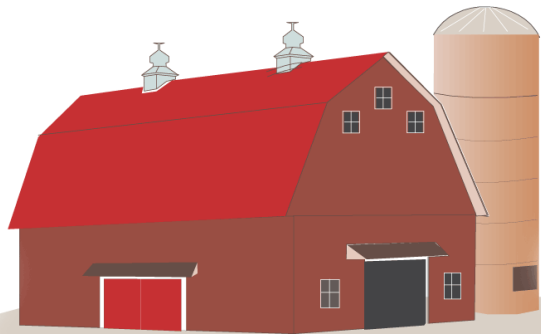
2000 Draft Estimate: ~ 65 pg TEQ<sub>DFP-WHO<sub>98</sub></sub>/day



The BYB concern is not just about releases, but also exposure...

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**Most BYB occurs in rural areas where emissions can readily contribute to contamination of animal feed and grazing lands.**





**THE GREAT LAKES  
BINATIONAL TOXICS  
STRATEGY**

## Three Tiered Approach: Education, Infrastructure, and Compliance

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- Educate government officials and the general public on the concerns of BYB.
- Provide information on infrastructure and alternatives to BYB in rural areas.
- Strengthen state, tribal, and local ordinances on BYB. Support greater compliance with existing regulations.



- The GLRC is an Executive Order issued in 2004.
- Priority setting exercise among Great Lakes stakeholders.
- Reducing household trash burning was selected as a priority. The Learn Not to Burn Toolkit is a product of the GLRC and the GLBTS participants.



# What's Inside the Toolkit ?

## One Stop Shopping for Resources

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- Introduction to the issue and Powerpoint presentation
- **Case studies** of successful national, regional, and local burn barrel programs
- Current trash burning laws in the Great Lakes Region
- Example ordinances on reducing trash burning
- Available brochures and outreach materials
- The Western Lake Superior Sanitary District Toolkit
- Information on infrastructure and waste transfer stations

# Hubbard County - Minnesota

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- In 1994, the County banned open trash burning
- The ban has been received positively by citizens
- The County provided two waste transfer stations and 14 recycling sheds in the county
- The facilities are paid for by a special tax assessment
- Trash burning has been virtually eliminated
- Success is due, in part, to the fact that residents are not charged a tip fee at waste transfer stations and recycling centers, and also because the county refused to accept ashes from burn barrels.



# St. Regis Mohawk Tribe - New York

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- From 1995-99, the Tribe developed a solid waste management plan, planned a waste transfer facility, and began an outreach campaign on burn barrels.
- In 2002, banned burn barrels except with a permit and began trash pick up service for \$2.00 per bag.
- Transfer station was built with funding from USHUD, USEPA, USDA, and IHS.
- Compliance with ban has been high, particularly since residents have become educated on the topic.





# IDENTIFY

The Problem

**Burning trash is:** Unhealthy  
Unnecessary  
Unsafe  
Unneighborly  
Illegal  
But, what about campfires?



# Air Defenders

- Interactive program for 5<sup>th</sup> grade students and up
- Includes lecture, science experiments, video, songs, video game and more
- Provides background information for adults or parents
- Helps students understand how individual behavior impacts everyone's environment

# GREAT LAKES INTER-TRIBAL COUNCIL



 Ontario

 Department of Environmental Quality

THE GREAT LAKES  
BINATIONAL TOXICS  
STRATEGY



Environment  
Canada


Environnement  
Canada



INDIANA  
DEPARTMENT OF  
ENVIRONMENTAL  
MANAGEMENT



New York State Department of  
Environmental Conservation

 Minnesota Office of Environmental Assistance

Ohio EPA



Illinois Environmental  
Protection Agency



Minnesota Pollution Control Agency



# Where Can You Get More Information?

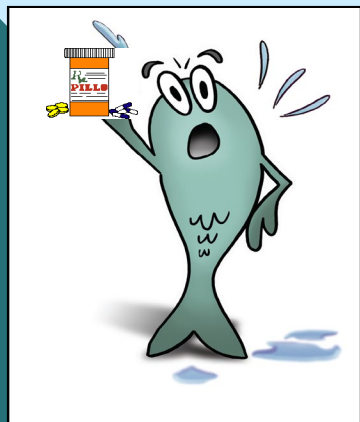
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Information on the national program, links to local programs, and other resources may be found on line at:

**[www.openburning.org](http://www.openburning.org)**  
**[www.epa.gov/msw/backyard](http://www.epa.gov/msw/backyard)**

Or contact Erin Newman at  
[newman.erin@epa.gov](mailto:newman.erin@epa.gov)





# Medicines in the Environment: Sources, Concerns, and Initiatives

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**Jessica Winter**

U.S. EPA Great Lakes National Program Office

March 14, 2007





# Presentation Outline

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Brief background on medicines  
in the environment

Collection Programs and  
Initiatives

Sea Grant resource kit

“Proper Disposal of Unwanted Medications: A  
Resource for Action in Your Community”



Chicago collection, May 2006



# Pharmaceuticals in the Environment

## U.S. Geological Survey

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139 streams analyzed in 30 states

Contaminants identified in 80% of these streams

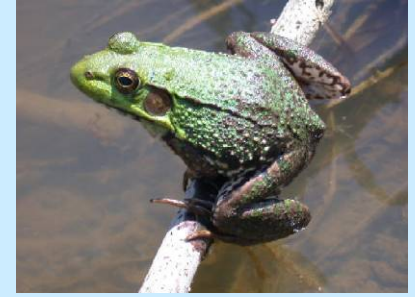
82 contaminants identified (many were pharmaceuticals)

Co-occurrence common; average 7 distinct contaminants identified per stream

Kolpin et al. “Pharmaceuticals, hormones, & other organic wastewater contaminants in U.S. streams, 1999-2000- a national reconnaissance.”

Environmental Science & Technology. 2002.

# Effects on Aquatic Organisms: Cause for Concern



- Aquatic exposure – chemicals in the aquatic environment can result in continuous, multigenerational exposure.

- Observations:

feminization of fish - link to estrogen exposure

Ex: Boulder Creek, CO: female white suckers outnumber males by > 5 to 1; 50% of males have female sex tissue (David Norris, Univ. of Colorado at Boulder)

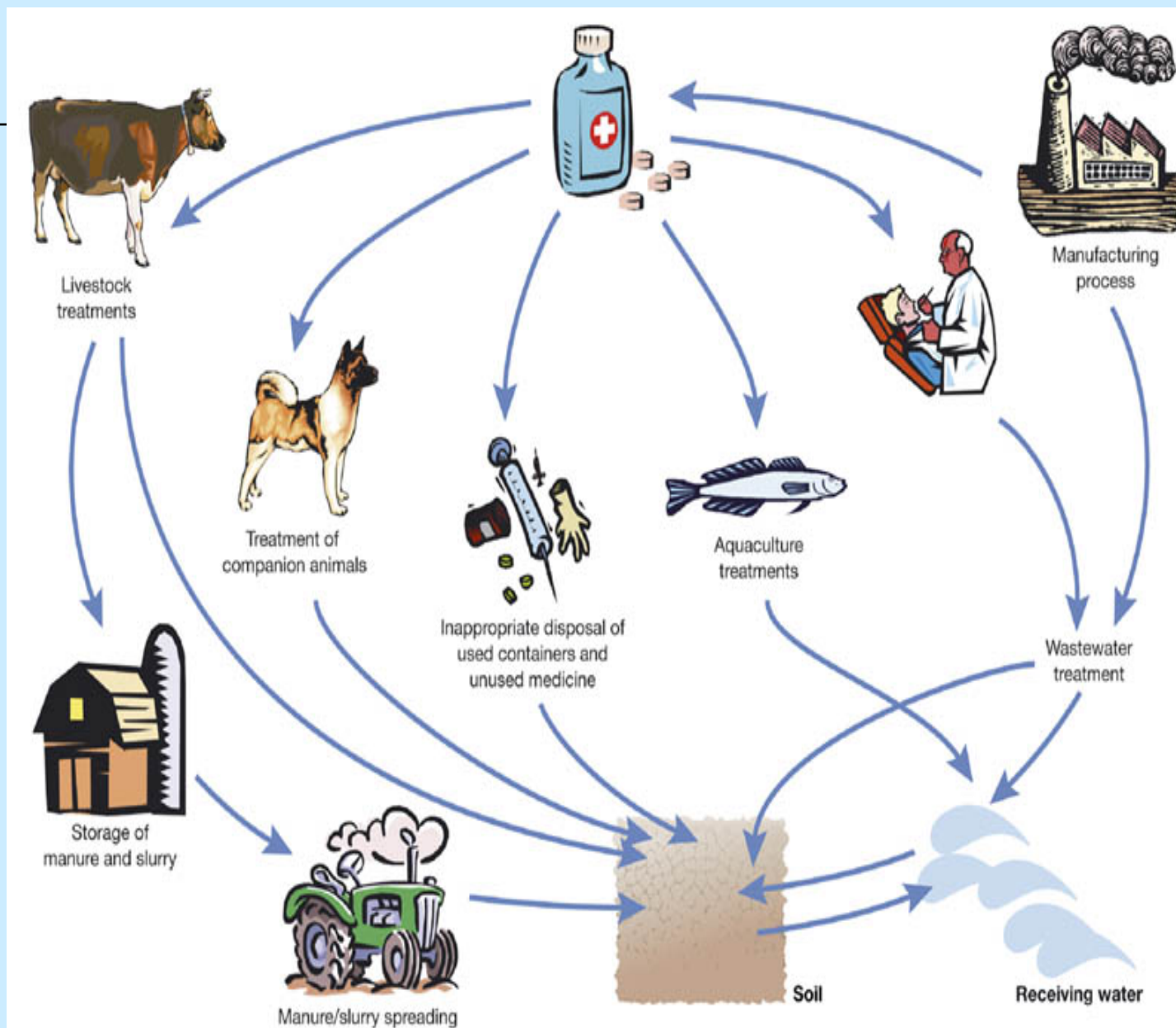


effects of antidepressants on fish and frog development

Ex: low levels of common anti-depressants, including Prozac, Zoloft, Paxil and Celexa, cause development problems in fish, and metamorphosis delays in frogs (Marsha Black, Univ. of Georgia)

# Pathways of Medicines into the Environment

- Outflow from wastewater treatment plants
- Surface application of manure and biosolids
- Commercial animal feeding operations and aquaculture
- Landfill leachate

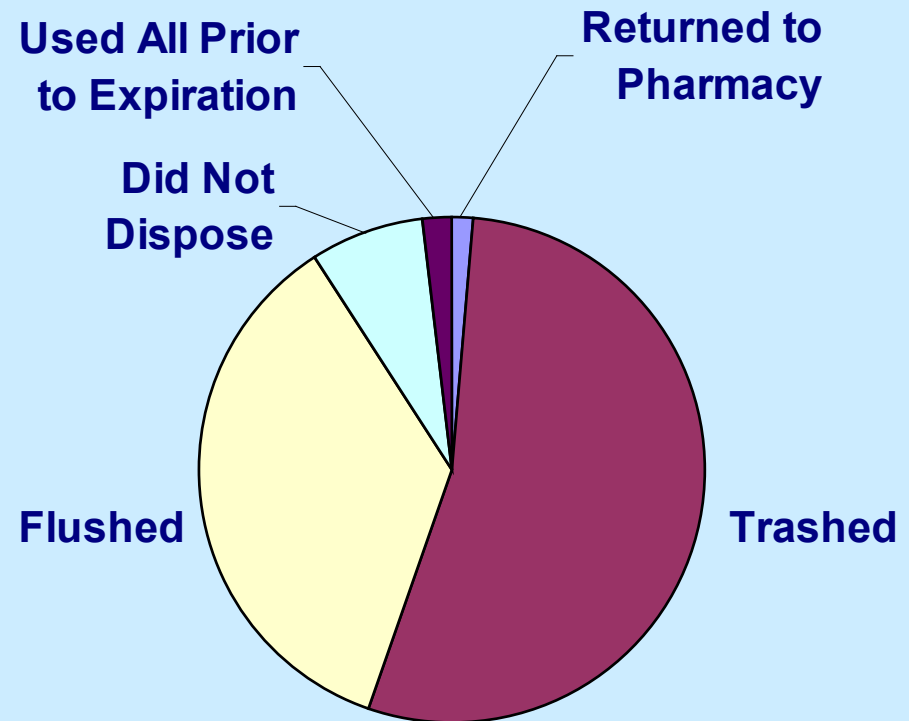




# Expired Medication Disposal Habits

500 patients surveyed:

- **54%** disposed of medications in the trash
- **35.4%** flushed drugs down the toilet or sink
- **7.2%** did not dispose of medications
- **2%** used all medication prior to expiration
- **1.4%** returned medications to the pharmacy






# Additional Risks of Unsafe Disposal or Storage

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1. Accidental poisoning: medicines are most common poison exposure category in the US
2. Diversion and Drug Abuse: teen abuse of medicines, both over-the-counter and prescription, is rising (NIDA)



# The new (2/21/07) federal prescription drug disposal guidelines advise Americans to:

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- If alternative methods of disposal are not available,
  - Take unused, unneeded, or expired prescription drugs out of their original containers
  - Mix with an undesirable substance
  - Put in sturdy, opaque, non-descript containers
  - Throw these containers in the trash
- Flush prescription drugs down the toilet *only* if the label specifically instructs doing so.
- Dispose of unused prescription drugs through pharmaceutical take-back programs if available

The White House Office of National Drug Control Policy (ONDCP), Health and Human Services (HHS), U.S. EPA



# Unwanted Medication Collection Initiatives

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- Take-back programs & pilots (CA, FL, IN, IL, OH, WI, WA, the Northeast)
- First legislation in Maine – designed as a mail-in program (Illinois, Massachusetts, and California considering similar legislation)

# Resource Kit:

## Proper Disposal of Unwanted Medications A Resource for Action in Your Community

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### Includes:

#### Background

What are the substances of concern?

What are the risks of improper disposal?

How do these substances enter the environment?

Take-back program case studies - models of success

Guidance for organizing medicine collections for households

Legislation on disposal and donation of unneeded medication

Materials for public education and outreach

Bibliography of news articles and scientific reports



# Resource Kit:

## Proper Disposal of Unwanted Medications A Resource for Action in Your Community

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- Reviewed and revised by scientists, doctors, nurses, pharmacists, drug enforcement, waste management professionals, and community organizers
- Kit requested by county water treatment/ solid waste officials, environmental groups, other EPA regions and state agencies
- Holding workshop/training with solid waste staff in Illinois
- Next: complete revisions, print and distribute, follow up with training & support





## To Learn More

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### **PPCPs web sites:**

[www.epa.gov/nerlesd1/chemistry/pharma](http://www.epa.gov/nerlesd1/chemistry/pharma)

[www.iisgcp.org](http://www.iisgcp.org) (Resource Kit coming soon)

Susan E. Boehme, IL-IN Sea Grant  
[sboehme@uiuc.edu](mailto:sboehme@uiuc.edu)

Elizabeth Hinchey Malloy, IL-IN Sea Grant  
[hinchey.elizabeth@epa.gov](mailto:hinchey.elizabeth@epa.gov)  
and

Jessica Winter, U.S. EPA GLNPO  
[winter.jessica@epa.gov](mailto:winter.jessica@epa.gov)

# Green Electronics Management Toolkit

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Chris Newman – US EPA Region 5

Jessica Winter – US EPA Region 5





# Background:

## Why are electronics a waste issue?

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- Electronics are a growing part of the waste stream, 2-4%
- Toxic components can present hazards
- Only 15-19% of e-waste was estimated recycled between 2003-2005
- Short life-cycles means rapid obsolescence

# How Much is There?

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- Prediction - 315 million obsolete computers by 2005 (National Safety Council).
  - Each year, 57 million computers and TVs are sold
  - 20 to 24 million added to storage.
- 315 million computers =
  - 1.2 billion pounds of lead
  - 400,000 pounds of mercury
  - 1.2 million pounds of chromium
  - 1.9 million pounds of cadmium

# Toxic Content of Concern



- Materials are used for a reason
  - Lead protects from x-rays
  - Lead is important to solder
  - Mercury bulbs light LCDs
- Most materials are not of concern until the end of life
  - Disposal
  - Dumping
  - Recycling

# Recycling in China

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- Woman about to smash a cathode ray tube from a computer monitor in order to remove the copper laden yoke at the end of the funnel. Monitor glass is later dumped in irrigation canals and along the river where it could leach lead into the groundwater (Guiyu, China)



December 2001. Copyright Basel Action Network.

# Nigeria

- Property tags were found from:
  - Local, state, and federal governments
  - Businesses
  - Health care providers
- Data security was studied by the Basil Action Network, and files were found from
  - Dentists
  - Department of Commerce employee's personal computer
  - State Child Welfare agency



# Green Electronics Management Toolkit

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- Focuses on a life-cycle management approach
  - Full life-cycle management tools
  - Green purchasing
  - Green in use management
  - Green end-of-life management

# Green Electronics Management Toolkit

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- Focuses on a life-cycle management approach
  - Full life-cycle management tools
    - FEC Total Cost of Ownership Tool
    - [Electronics Purchasing Environmental Assessment Tool](#)
    - [Electronics Environmental Benefits Calculator](#)
  - Green purchasing
  - Green in use management
  - Green end-of-life management

# Green Electronics Management Toolkit

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- Focuses on a life-cycle management approach
  - Full life-cycle management tools
  - Green purchasing
    - ENERGYSTAR 2007 Computer Standard
    - EPEAT
    - EEBC
  - Green in use management
  - Green end-of-life management



# Green Electronics Management Toolkit

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- Focuses on a life-cycle management approach
  - Full life-cycle management tools
  - Green purchasing
  - Green in use management
    - Energystar EZWizard
    - FEC O&M Tools
  - Green end-of-life management

# Green Electronics Management Toolkit

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- Focuses on a life-cycle management approach
  - Full life-cycle management tools
  - Green purchasing
  - Green in use management
  - Green end-of-life management
    - Data Security
    - Reuse and Recycling Planning and Audit Tools
    - Recycling/Disposal Regulations
    - Related Tools
      - Paper, Ink and Toner, Product use optimization

# Green Electronics Management Toolkit

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- Expected completion Q2 2007
- For more information contact
- Chris Newman, U.S. EPA,  
newman.christopherm@epa.gov
- Jessica Winter, U.S. EPA GLNPO,  
winter.jessica@epa.gov