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## Introduction: Translating Passion Into Impact

### Mission

**The NIH mission is to seek fundamental knowledge about the nature and behavior of living systems, and the application of that knowledge to enhance health, lengthen life, and reduce the burdens of illness and disability.**

The mission of the National Institute of Environmental Health Sciences (NIEHS) is to discover how the environment affects people in order to promote healthier lives.

### Vision

The vision of NIEHS is to provide global leadership for innovative research that improves public health by preventing disease and disability.

### Sustainability

A healthy planet is essential for human health. By promoting sustainability, NIEHS seeks to ensure that we will continue to have the materials and natural resources to sustain and improve human health, which includes promoting a healthy environment. As we perform vital research, we remain focused on our own footprint on the environment and human health.

Our Institute has increased transparency and expanded our social network. We welcome feedback from our community regarding our research, strategic plan, and sustainability measures. Working together with our stakeholders, we benefit from shared ideas and improved understanding.

We continue to pursue and invest in energy-efficient and environmentally friendly technologies, materials, and products. We work to reduce our waste and pollution by reusing and recycling, choosing greener alternatives in our laboratories, and diligently monitoring our waste streams. We have increased our use of technology as an alternative to air travel and employee commuting, helping reduce our overall carbon footprint. Our promise to continue such improvements includes a commitment to report our progress to you, and this report is a key element of that public accountability.

While focusing this report on the impact of our own operations, we encourage our partners and suppliers to join us in meeting the expectations set for us in federal Executive Orders and in **HHS policy**. Together, we can make a difference and create a more sustainable world while advancing our scientific mission.



## A Message From Our Director

We have continued to make significant progress in reaching our sustainability goals. Our strong commitment to reducing impacts on human health and the environment has been a driving force, with creative input and effort from staff throughout the Institute.

Technology has enabled us to meet remotely, create and distribute electronic versions of newsletters, and increase the efficiency of our operations while creating energy reductions. These and many other measures have helped us reduce paper and printing, cut energy and water consumption, and increase our waste diversion.

Since 2010, we have:

- Reduced water consumption 16 percent
- Cut electricity use 7.5 percent
- Increased recycling 41 percent
- Added hybrid vehicles to our fleet
- Removed 34 percent of our copiers and upgraded to more energy efficient models

To share best practices and collaborate on new projects, we actively participate in partnerships such as NIH **Green** Teams and the NIH Sustainability Management Team. Through presentations and outreach events hosted on our campus, we connect with scientists, staff, and visitors. Such collaboration and feedback is critical to discovering new opportunities to improve our own sustainability, as well as to share our best practices with others. Examples include:

- Lab corridors — by moving recycling bins inside the labs, we increased recycling while creating safer and cleaner hallways.
- Freezers — an investigation found that older ultra-low temperature laboratory freezers can use the same amount of energy per year as a typical U.S. home. Newer technology uses less energy and allows more storage capacity in the same footprint. Using a “cash for clunkers” program, we cut the number of freezers and reduced energy use without loss of storage space.

We are proud of our achievements, and we have high aspirations for the future. Thanks for your interest in reading this report and sharing in our pursuit of sustainability!

*Linda Birnbaum*



## NIEHS People Power

Engaging external stakeholders is an important part of our mission. Through meetings, symposiums, and community forums, we share information and insight while collecting valuable feedback, promoting thoughtful conversation, and coming up with meaningful solutions. Our employees' voluntary support to the community also helps keep us engaged and in touch. Some examples include:

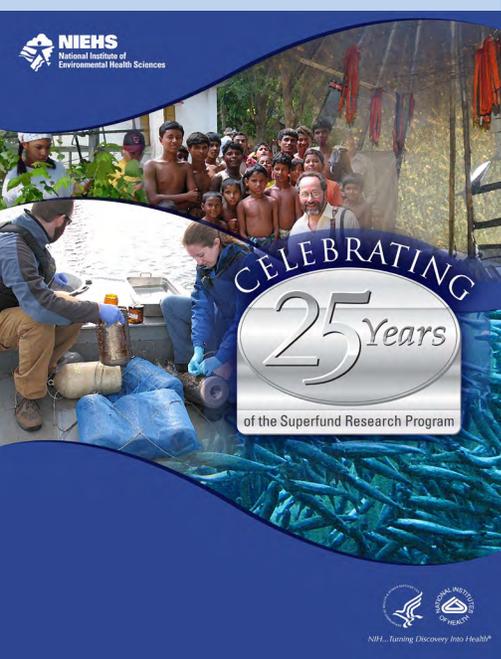
- **Environmental Stewardship Initiative** meeting every April
- **Sustainable Remediation Symposium**
- **Community forums**
- **Green chemistry**
- **Feds Feed Families**
- **Combined Federal Campaign**

Our employees enjoy opportunities to learn about and promote awareness and sustainable lifestyles. The joint campuses of NIEHS and EPA share a stunning 23-acre lake. In 2012, a lake-naming event brought everyone together to advocate the safekeeping and prosperity of this lake, and all natural areas on our shared campus. The name chosen was **Discovery Lake**. Other events and activities include:

- Annual Spirit Lecture
- Annual Earth Day events, including a farmers market and speakers
- Lakeshore cleanup and adopt a highway programs
- Annual health and fitness week
- Recognition events for postdoctoral fellows and animal technicians
- New events in 2012: America Recycles Day and Medicine Take Back Day

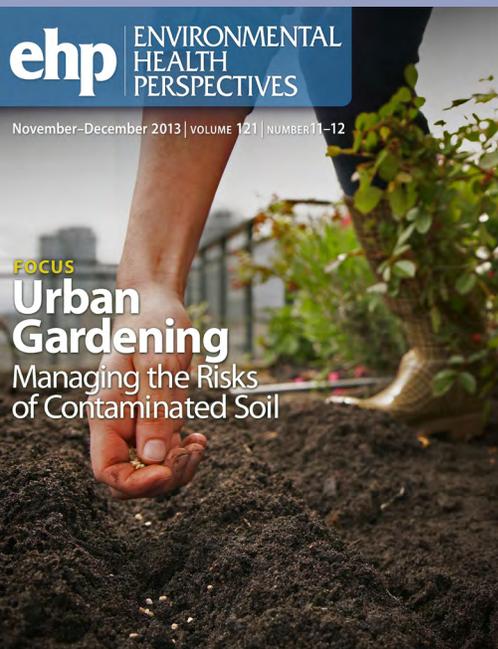
NIEHS has achieved many awards, honors, and milestones over its history. Without exception, we continue to progress and achieve limitlessly. Honors and milestones include:

- National Toxicology Program achieves division status
- APHA's Environment Section celebrates 100 years
- NIEHS and Combined Federal Campaign 50 years
- NIH turns 125 years old
- NIEHS/NTP celebrates 20-year partnership agreement with U.S. Food and Drug Administration
- **Superfund Research Program** creates 200th edition SRP Research Briefs
- NIEHS achieves **AAALAC** accreditation (since 1972)



- **Tox21** program investigates 10K chemical library
- **Gulf Study** enrollment milestone of 10K
- Breast Cancer Fund **honors** NIEHS
- November 2012: 25th Anniversary of **Superfund Research Program**
- **Green Champions Good Neighbor Award** for fiscal year 2011
- **Green Champions** Honorable Mention for Environmental Stewardship for fiscal year 2010

**FOCUS**  
**Urban  
Gardening**  
Managing the Risks  
of Contaminated Soil



## Public Access

Engaging the public and sharing information is a vital part of our mission. The use of social media has expanded over recent years and NIEHS is fully immersed. With more than 3,000 likes on **Facebook**, more than 30 videos on **YouTube**, and more than 8,800 followers on **Twitter**, NIEHS has a solid presence. Other contributions include sharing **photos of meetings and events**, hosting webinars, and publishing press releases, fact sheets, and monthly **newsletters**.

Reporting is a fundamental and critical function of science. NIH-funded scientists and collaborators generate hypotheses and data, make discoveries, and draw conclusions. Through publication, they offer an opportunity to promote discussion, engage in peer review, create goals, and begin new endeavors. Reporting in 2011 and 2012 included:

- **Report on Carcinogens** — hazard evaluation
- **Nanomaterial Registry** — members of NIH leadership and advisory board
- Intramural publications in peer reviewed journals: 653 (2011) and 692 (2012)
- Extramural publications in peer reviewed journals: 2829 (2011) and 2478 (2012)



## Strategic Focus

Sustainability requires strategic thinking. With stakeholder involvement, NIEHS created a new 2012-2017 **Strategic Plan**, which sets a framework for advancing environmental health science with the aim of improving health. This plan provides direction, guidance, and inspiration for our Institute and incorporates six strategic themes:

- Fundamental research
- Exposure research
- Translational science
- Health disparities and global environmental health
- Training and education
- Communications and engagement

NIEHS maintains a strong focus on prevention, lessening the burden of disease on our society by promoting balance in environmental and human health for future generations. For example, as co-lead agency on the topic of **environmental health** and a key partner for the **respiratory diseases** for **Healthy People 2020**, NIEHS is poised to partner with numerous other organizations to investigate topics ranging from healthy homes and communities to global health.





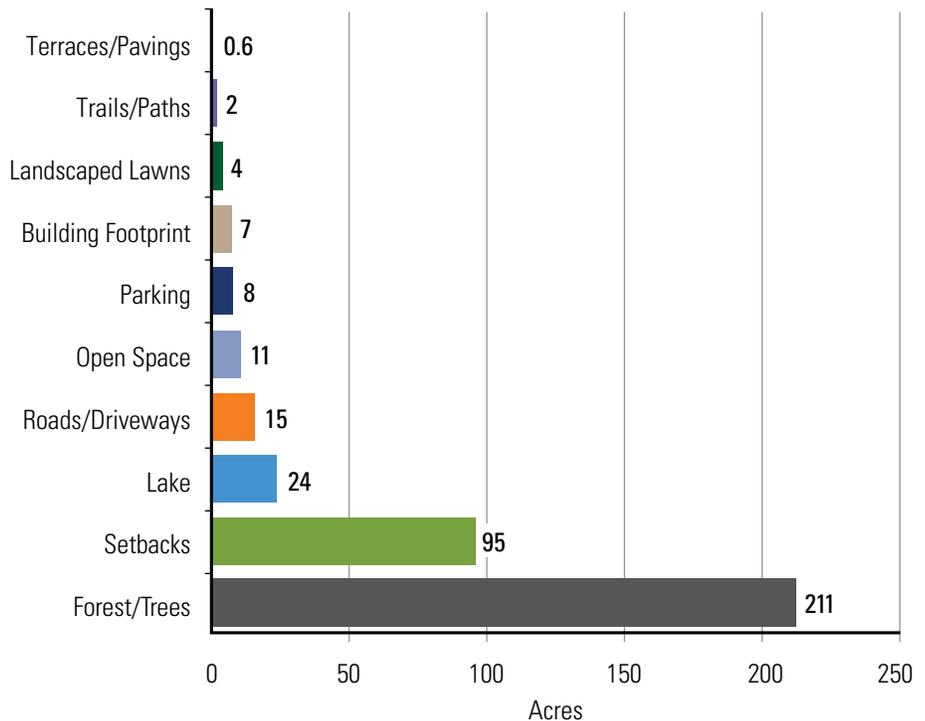
## Natural Resources

The 511-acre campus we share with the EPA contains not only offices and labs but also expanses of open fields and wooded areas. It seems appropriate that an environmental institute would be placed in such verdant surroundings. We show our gratitude and respect by protecting these areas for wildlife, and preserving land and water quality and natural beauty.

We recognize the beauty of our campus, and work every day to protect it for us and the habitat it supports. With more than 200 acres of forestry on our campus and a 23-acre lake, we are reminded of our obligation to protect and preserve the natural environment.

We have intensified our efforts to identify and manage invasive species in natural areas, to determine potential impacts and consider future directions and planning. For example, sterile (non-proliferating) carp were added to our on-campus lake to control invasive aquatic plants, thereby avoiding the need to use chemical herbicides.

### Landscape Footprint





## Energy and Water

We are acutely aware of the potential effects of global climate change on the environment and human health. On the NIEHS campus, we have experienced weather extremes and changing weather patterns in recent years. As a result, a focus on preparation and adaptation has sprung from necessity, and helped us become a leaner, greener institute.

Biomedical research is energy intensive. With more than 1 million square feet of labs and offices, it is challenging to find new ways to reduce. Surely heating, ventilation, and air conditioning (HVAC) systems are a large source of consumption, but requirements for the safety and well-being of those working within a laboratory environment are paramount and force us to find new sources for reduction.



Trends show a continued downward movement in our energy and water consumption. We have reduced water consumption more than 40 percent, and a new reverse osmosis water system is expected to reduce these numbers even more, recycling nearly 70 percent of our cooling tower blow-down water. This should cause a leveling of the water demand for the months of June, July, and August, instead of the large spikes in demand typically seen.

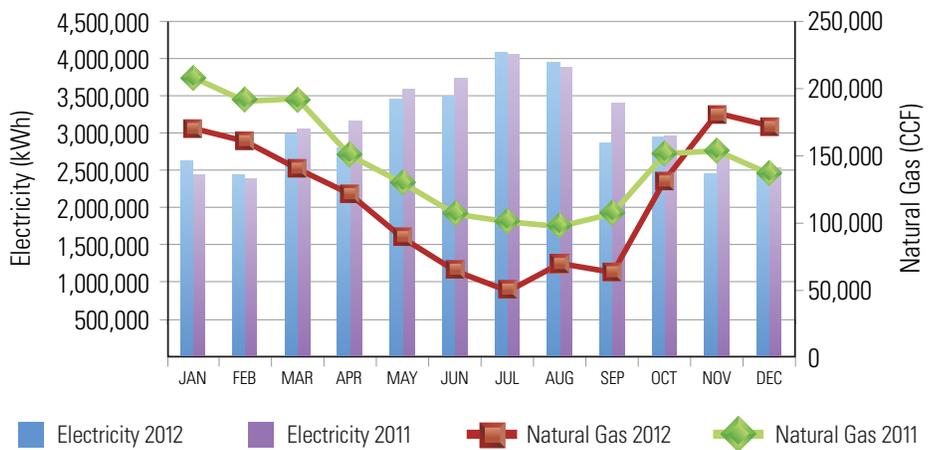
The main use of energy on our campus is heating and cooling, a weather-dependent factor. Challenging but attainable goals have been set to reduce our energy intensity 3 percent per year. We surpassed those goals for the last two years and plan to reduce even more in the future. We continue to search for ways to improve our operations and energy and natural resource consumption through Energy Savings Performance Contracts (ESPCs), establishing metrics, and having conversations with the scientific staff about their needs and how we can conserve more.

We have made significant strides in upgrading equipment at our central utility plant. By replacing two older chiller units with a single, high-efficiency model, we will reduce energy, remove outdated refrigerants, and achieve more reliable and efficient output.

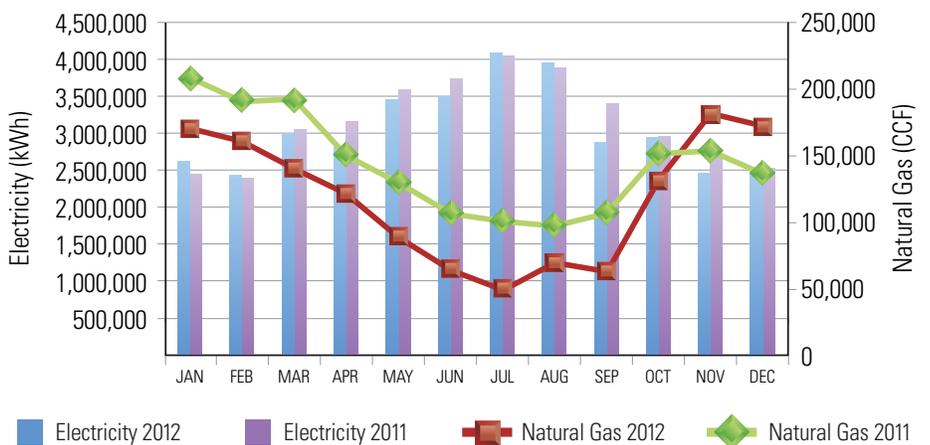
We have surpassed all expected goals for water reduction, and continue to explore opportunities to reduce even more. With our new reverse osmosis system in place, we expect to achieve a reduction in the use of potable water for water loss in evaporative cooling towers. With a 70 percent return after treatment, we could reduce as much as 6 million gallons each summer. We look forward to providing more results like these in the future.



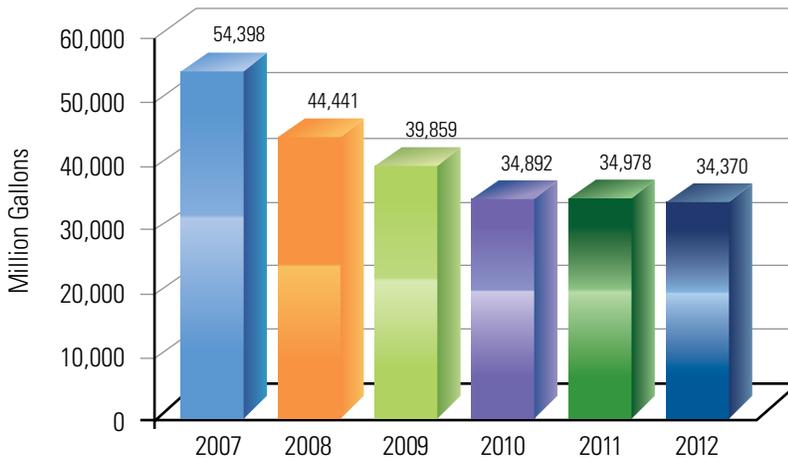
### Energy Consumption 2011-2012



### Energy Consumption 2011-2012



### Annual Water Consumption Trend





## Waste and Recycling

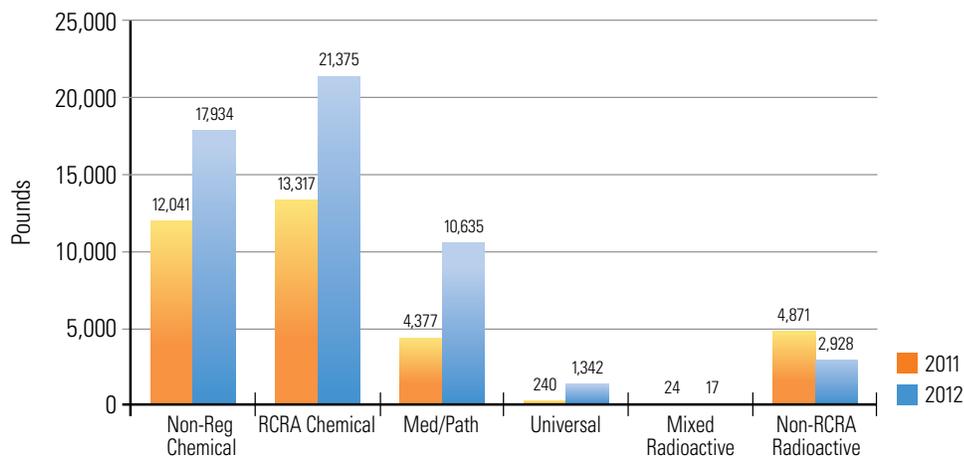
Our regulated waste remains proportionally the same, but a recent uptrend of waste has occurred. This increase is based on an increase in research activities, the turnover and decommissioning of some long-standing laboratories, and new regulations on the management of waste streams from our darkroom facilities.

Although the generation of regulated waste results from mission-related activities, we continue to consult with research investigators to find alternative materials and methods that are safer and less toxic.

A new laboratory corridor policy increased the recycling of some items that were previously sent to the landfill. Our recycling program has increased in activity and volume as this corridor policy came into play. This program put recycling bins inside the laboratory space, allowing for easier access for lab members along with an increased frequency of collections.



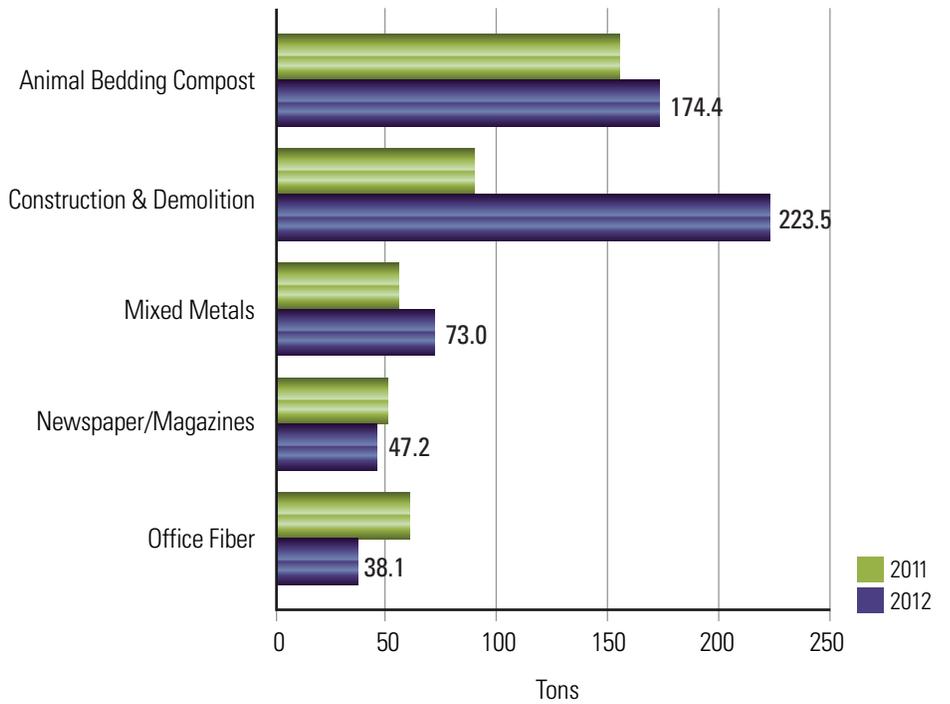
### Managed Waste 2011–2012



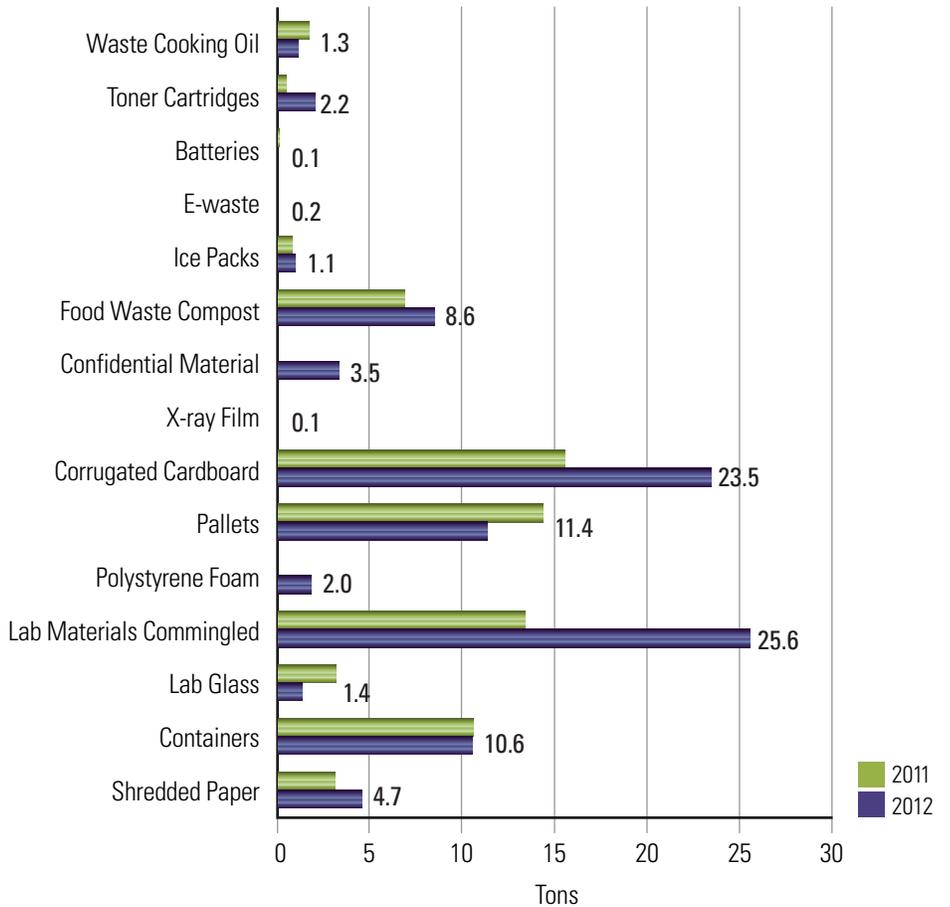
Non-Reg = Non-regulated  
 RCRA = **Resource Conservation and Recovery Act**  
 Med/Path = Medical/Pathological



## Recycling Summary (Large Volume Materials)



## Recycling Summary (Small Volume Materials)

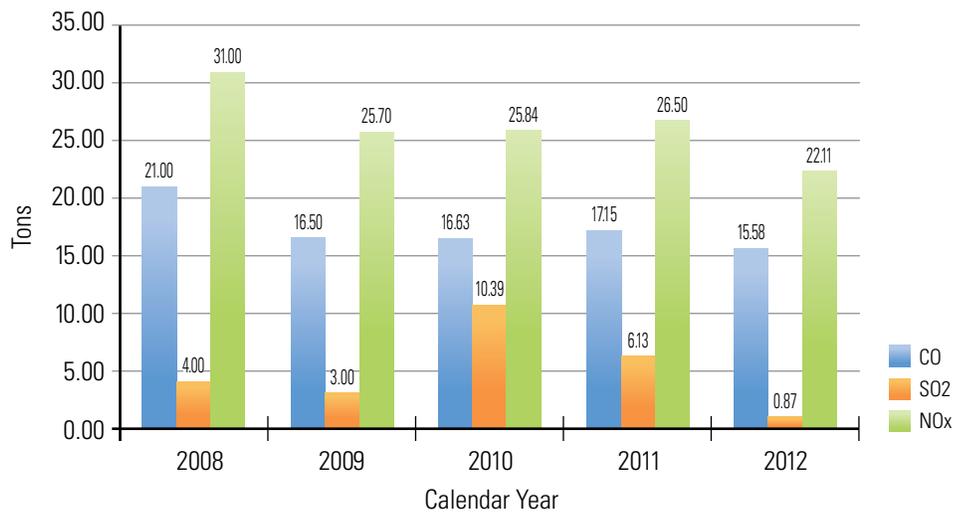




## Emissions

The high temperature hot water (HTHW) generators (boilers) and emergency generators produce emissions such as nitric oxide and nitrogen oxide (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and carbon monoxide (CO). We have reduced the duration time for testing emergency generators, thereby reducing emissions. Mild winters have also reduced the heating demand on the HTHW generators and helped maintain lower emissions.

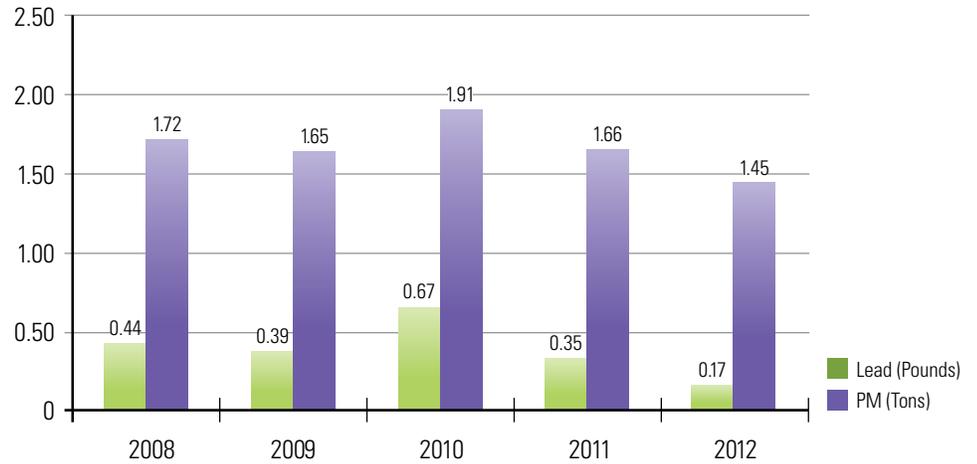
### NIEHS/EPA NO<sub>x</sub>, SO<sub>2</sub>, and CO Emissions



The air emission of metals (e.g., lead) and particulate matter continues to decline slowly. We continue to search for sources of these items to reduce even further. As an example, we reduced the frequency of radioactive waste treatment using incineration. Reducing our pathological waste by weight and volume also reduces the reliance on incineration for waste treatment.

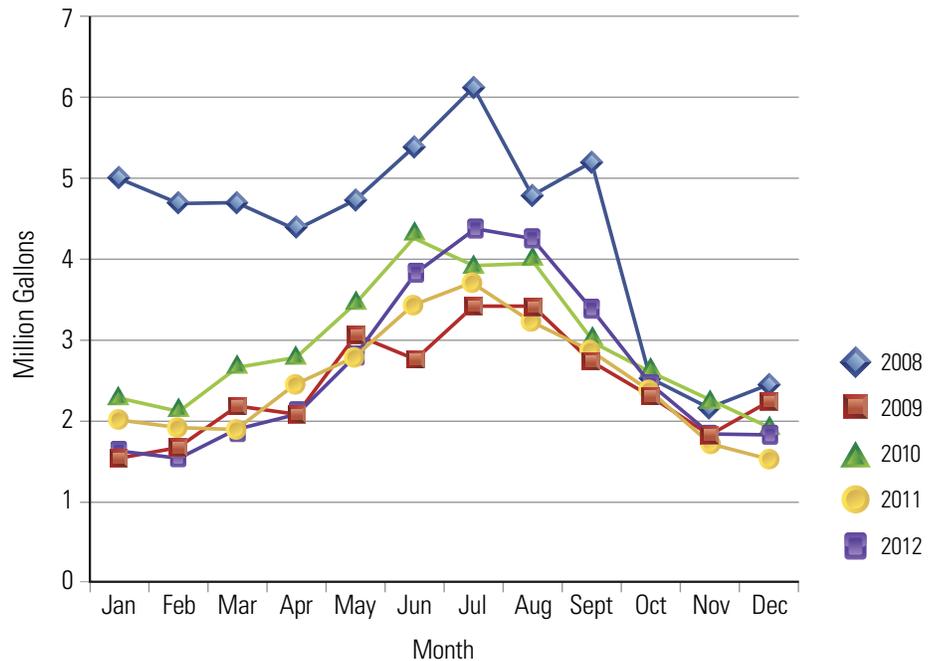


### Lead and Particulate Matter (PM) Emissions Trend



Wastewater emissions have been on a downward trend for the last five years. Overall, we have reduced the volume of wastewater nearly 50 percent from our baseline — a trend we expect to continue as we bring our reverse osmosis system online in 2013.

### Wastewater Emissions Trend

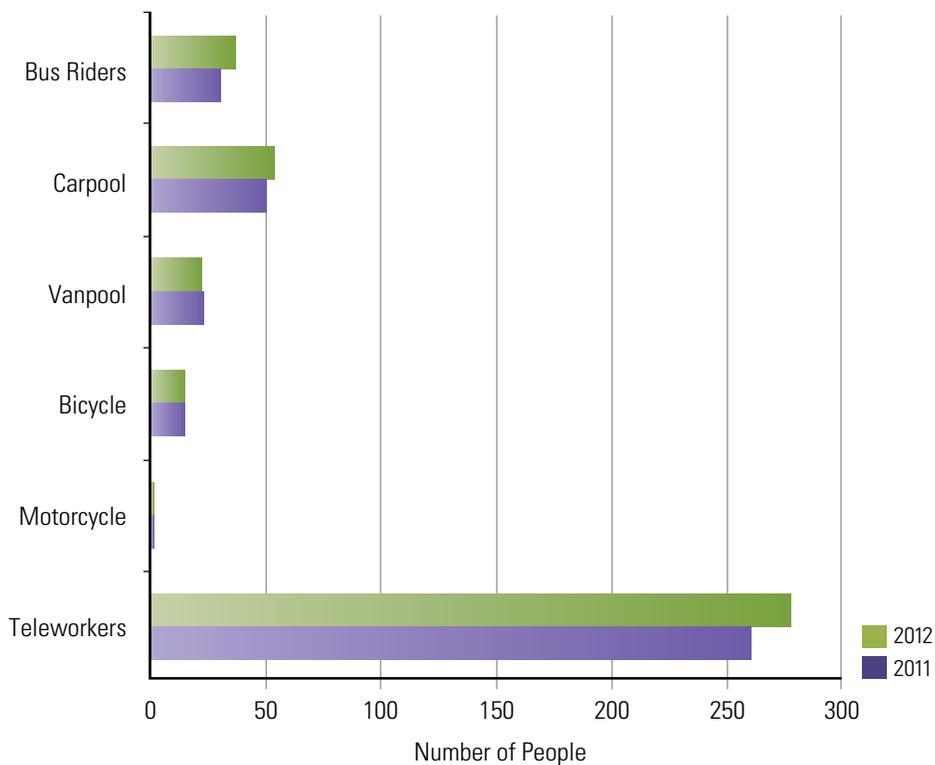




## Transportation

With a 42 percent increase in teleworkers since the last report, the Institute has stepped up its game to promote more work-life balance and flexibility for its workers. At the same time, teleworking has reduced emissions from daily commutes. Alternative commuting, such as carpooling and bus transit, has increased slightly as well.

### Transportation





Maintaining and improving the fuel efficiency of our overall motor vehicle fleet remains a challenge. A targeted information campaign and enhanced training helped achieve better compliance with the federal mandate to use E85 for the flex fuel vehicles. Fleet fuel efficiency, however, remains an area of needed improvement.

<b>NIEHS Fleet Vehicles</b>	<b>Number</b>
Fuel efficiency less than 10 mpg	24
Fuel efficiency 11-19 mpg	15
Fuel efficiency over 20 mpg	4
Flex fuel vehicles	24
Hybrids	2

Goals for the future include analyzing vehicle usage in our motor fleet to identify potential vehicle reductions or shifting to more efficient models.



## Information Technology

Biomedical research demands sophisticated and up-to-date technology to keep up with the pace of change and rapidly expanding data generation. Since our last report, the Institute has taken steps to improve efficiency and stewardship of information technology (IT) resources. Some examples include:

- IT equipment energy reduction — using life cycle analysis for tracking and replacement, and Energy Star guidelines for equipment usage
- Network upgrade — allowing higher productivity for equipment and users
- Video conferencing and remote meeting technology upgrades — reducing travel needs, and improving efficiency
- Spring cleaning events — taking old and outdated equipment out of service



## Looking Ahead

With our goal of continuous improvement, we will seek opportunities in all of our operations to lessen our environmental and health impacts while advancing our scientific mission. In the near future, we will focus on three priority areas:

- Enhance our initiatives in **green chemistry**, to create safer laboratories and to further reduce chemical waste. By engaging with our research investigators, green chemistry options can be explored so that the purchase and storage of chemicals can be minimized and better aligned with mission needs.
- Achieve reductions in **printing and paper use**, to conserve resources and lower energy consumption. Efforts would entail expanding the use of 100 percent recycled content paper, and encouraging electronic document storage and transmission.
- Include sustainability principles and features in the early stages of **laboratory design and renovation**, to improve predictability and efficiency in the areas of sample, supply, and energy management.