



We've all seen the photos of countries with waste management struggles – piles of trash along dirt roads, cans and bottles abandoned in lakes and rivers. Laura Knudsen witnessed these images first-hand on a trip to Ecuador during her undergraduate program at the University of Washington.

This had a profound impact on her.

Upon completion of her degree, Laura spent a summer working at the U.S. Environmental Protection Agency (EPA) in their Seattle office. As she worked with beverage container recycling and material recycling standards, it became apparent to her that many people don't consider what actually happens to their waste after they dispose of it. As she pursued her Master's of Environmental Science & Public Affairs degree at the Indiana University of Bloomington (IUB), Laura set her focus on waste issues and found funding to travel to Chile to work for Recycla, an organization dedicated to addressing electronic waste (e-waste) management and providing innovative solutions. Touring the Recycla facilities and writing some of their grants gave Laura a deeper understanding of the recycling processes and inspired her to focus her studies specifically on e-waste.

Back at home, Laura performed an online search for possible scholarships, which lead her to the Environmental Research & Education Foundation (EREF) scholarship program. She was awarded a Riethmiller/PTR scholarship and began her research project entitled "Electronic Waste Issues and Solutions."

E-waste is comprised of electronic equipment – such as computers, televisions and cell phones – that have reached the end of their useful life. Unfortunately, e-waste is often improperly handled – by being stored for years in the home, disposed in a landfill not equipped to deal with such materials or given to "sham" recyclers who then export the waste to developing countries with poor environmental regulations. Proper disposal of e-waste involves disposing of the materials via drop off centers, permanent small e-



waste collection programs or mass community collection events. According to the EPA Office of Solid Waste, in 2007 only 18 percent of electronic products that had reached the end of their lifecycle were recycled.

Laura set out to not only collect as much e-waste as possible in her local area, but to also educate the community about the proper disposal of e-waste. She partnered with IUB's sustainability task force to create a community e-waste collection event. Because of the growing obsession with producer responsibility – a concept which means electronics manufacturers will “take back” their products once they have reached the end of their useful life – the task force decided to work with Apple to provide recycling services for the event, due to the company's extensive experience with university e-waste collection events and clear process for e-waste recycling. *(To date, Apple has instituted recycling programs in cities and college campuses in 95 percent of the countries where our products are sold, diverting more than 84,853 metric tons of equipment from landfills since 1994. <http://www.apple.com/environment/#recycling>)*

To promote the event, the project team developed an event logo and Web site, as well as fliers, posters and magnets. The event was held over the course of three days and 832,000 pounds (415 tons) of e-waste was collected. The project team also developed a participant survey, which showed most event participants were between 50-57 years of age and came from locations within 0-5 miles of the event. Helping the environment and there being no charge to recycle were the top reasons for participation in the event.



Event Logo



*E-waste art entry from student William Spelker*

Despite its success, the initial event identified there was a need for increased education and public awareness of e-waste issues. To improve the event for its second occurrence, the project team increased its communications efforts and organized an art contest. They also put more emphasis on getting volunteers involved from the university and community, and had students from the local high school's environmental club help out with the event. Approximately 600,000 pounds of e-waste were collected at the second event. Although the e-waste volume was smaller than the first event, the number of participants in the event was larger, which indicates improved awareness of the event.

Since graduating from IUB in 2010, Laura has accepted a position with the EPA's Office of Solid Waste & Emergency Response where she deals with toxic hazardous waste sites and their clean up as part of the Superfund program.

*“I am so thankful to EREF for providing me with the funds to implement such an important event that not only made an impact on the environment but educated a community on the importance of proper waste handling.”*

*Laura Knudsen*

## More on Electronic Waste



With the onslaught of the technology boom in the 20<sup>th</sup> century, more electronic waste is in existence than ever before. While there are landfills for hazardous materials in existence and some landfills have processes in place to redirect e-waste, if electronics are put into a regular landfill, the liner is not sufficient to deal with the toxic components often found in electronics. Like Apple, many computer, TV and cell phone manufacturers and retailers have programs in place to educate their customers about the proper disposal of e-waste, as well as to provide customers with a place to return or recycle used electronics. All Best Buy stores in the U.S. offer an in-store solution for customers to bring their old, unused or unwanted electronics – no matter where they were purchased – for responsible recycling. Dell has partnered with FedEx on an at-home pickup program so that customers can get rid of unwanted equipment without leaving home.

Unfortunately, not every electronics recycler follows environmentally sound recycling practices. There have been situations where supposedly reputable companies take collected e-waste and break it down resell it or even transport it to another country, rather than disposing of it in an environmentally-sound manner.

As awareness grows about e-waste through events like Laura Knudsen's Electronic Waste Collection Days, existing collection efforts and the creation of future e-waste collection programs, society is providing a healthier and more secure environment for future generations.

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Laura Knudsen's research project was funded by a Riethmiller/PTR scholarship. [Click here to view the full final report on the EREF Web site.](#)

Robert J. Riethmiller, chairman of PTR Baler and Compactor, currently serves on the EREF board as the chairman of the Scholarship Committee. Riethmiller's grandfather, also Bob Riethmiller, began working for PTR in 1911, and purchased it in 1929; since then it has been a family-run business. PTR is a fourth generation, family-owned company that manufactures, installs and services balers and compactors in all 50 states and sells internationally. Riethmiller has been working in the waste industry for over 50 years. One Riethmiller/PTR Scholar is awarded annually.

EREF is a 501(c)(3) charity that funds and directs scientific research and educational initiatives for waste management practices to benefit industry participants and the communities they serve. EREF allocates between \$0.5 and \$1 million annually in research grants and graduate level scholarships, with focus areas that include:

- Transport/Collection
- Policy/Economics
- Recycling/Waste Minimization
- Combustion/Waste-to-energy
- Equipment/Safety
- Conversion Technologies
- Life cycle inventory/analysis
- Landfills

For more complete information on EREF funded research, its scholarship program and how to donate to this great cause, visit [www.erefdn.org](http://www.erefdn.org).



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