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Project Title:
Pollution Prevention Information Network
for the Great Lakes Regional Pollution Prevention Roundtable

Grant Program:
#NP00E01214

Project Period:
October 1, 2013 – September 30, 2014 (no cost extension through December 31, 2014)
Reporting Period:
October 1, 2013 – September 30, 2014 (no cost extension through December 31, 2014)

The Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) aims to strengthen environmental sustainability programs for the benefit of businesses, organizations, and government agencies throughout the Great Lakes regions of the U.S. and Canada. It accomplishes this by developing and promoting information tools and facilitating networking and training among pollution prevention technical assistance providers and companies. The Illinois Sustainable Technology Center (ISTC) is the host agency for GLRPPR. ISTC is a division of the Prairie Research Institute at the University of Illinois at Urbana-Champaign.

This final report details work that GLRPPR does in cooperation with the other P2Rx Centers under the Pollution Prevention Information (PPIN) grant program, which funds the P2Rx National Network. GLRPPR has been a member of P2Rx since that organization was established in 1997. GLRPPR partners with the other regional P2Rx centers on specific projects and on the general shared goal of improving networking and information dissemination among pollution prevention professionals nationwide.

GLRPPR staffing updates

In March 2014, GLRPPR hired Lauren Murphy, a junior at the University of Illinois who is majoring in Civil and Environmental Engineering, to assist with the project. Although we had planned to hire an hourly worker on the project in October 2013, the process was delayed by a failed search in late fall 2013. We reposted the position in January and received interest from a number of qualified applicants. Ms. Murphyworked full-time during summer 2014 and returned to part-time work in fall 2014. She will continue to work with GLRPPR until graduation in spring 2015.

In November 2013, GLRPPR contracted with MacMedia, a certified University contractor, to complete the GLRPPR web site redesign. The templates were delivered to GLRPPR in August 2014. More information about this portion of the project appears in Task 2.

Presentations and Publications

In addition to GLRPPR's ongoing communication efforts, Laura Barnes writes articles and gives presentations that contribute to GLRPPR's visibility as an organization. During this project period, she published and presented the following:

Barnes, Laura L. (2014). "Pollution Prevention Information: What's Out There and Where To Find It." (Presented at Indiana Environmental Stewardship Program meeting, September 2014). Slides available online at http://hdl.handle.net/2142/35294.

Barnes, Laura L. (2014). "Great Lakes Pollution Prevention Roundtable Provides Information Resources, Tools, and Training." *ERMD News: The Quarterly Newsletter of the Environment & Resource Management Division*, Summer 2014, 4-5. Online at http://hdl.handle.net/2142/50020.

Barnes, Laura L. (2013). "P2Rx Centers Provide Technical Assistance, Training, and Information to Help Businesses Go Green and Improve Their Bottom Line." *ERMD News: The Newsletter of the Special Libraries Association's Environment Resource Management Division,* Fall 2013. Online at http://hdl.handle.net/2142/46554.

Barnes, Laura L. (2013). "Using GLRPPR (and other P2Rx Centers) to Identify Hazardous Substance Reduction Resources." (Presented at U.S. EPA Region 5's Hazardous Substances Reduction Training. Chicago, IL: December 5, 2013). Slides available at http://hdl.handle.net/2142/46418.

Barnes, Laura L. (2013). "Greening Your Library: Sustainable Practices for a New Generation." (Presented via webinar hosted by the Special Libraries Association Illinois Chapter. Online: November 22, 2013). Slides available online at http://hdl.handle.net/2142/46297.

Task 1: Support the P2Rx Network

All activities in this task are ongoing. Because GLRPPR's previous grant period overlapped with the current funding cycle, ongoing activities from October 2013-January 2014 were funded by the previous grant. Results from that period are reported in the progress report covering August 2013-January 2014 and in the project's final report. Ongoing tasks for October-December 2014 (GLRPPR's no-cost extension period) are funded under the 2014-2015 PPIN grant and will be reported in the progress report covering October 2014-March 2015.

Participating in the P2Rx network allows GLRPPR to leverage relevant work done in other regions to ensure that P2 technical assistance providers in Region 5 have the resources they need to do their jobs better. Laura Barnes subscribes to the e-mail lists for the other P2Rx Centers and frequently forwards messages from those lists to the Roundtable e-mail list, which currently has 341 subscribers. The staff from the other P2Rx Centers

also subscribe to the Roundtable list, which ensures that webinars and resources developed in Region 5 are publicized to other EPA regions.

From February-September 2014, Laura forwarded 109 messages. Topics included:

- EPA's new AVERT tool, which was designed for state air quality planners to calculate county-level reductions in electric power plant emissions resulting from energy efficiency and renewable energy policies and programs.
- A call for papers and presentations for the 2014 Indiana Partners for Pollution Prevention Conference and Trade Show.
- Webinar notices relating to a variety of pollution prevention and sustainability topics, including technical assistance, behavior change, green chemistry, and sustainable electronics. These notices also publicized series, including those from ACEEE's Behavior Change Program, NPPR's Safer Chemistry Challenge Program, the Great Lakes Green Chemistry Network, the Michigan Green Chemistry Clearinghouse, and the Illinois Green Government Coordinating Council's Green Universities and College Subcommittee's monthly web calls.
- Call for papers for an American Chemical Society Annual Meeting session on the Great Lakes Restoration Initiative.
- Funding notices for a variety of relevant government and foundation grants.
- Announcement of new fact sheets from the [Interstate Mercury Education & Reduction Clearinghouse (IMERC).](#)
- Announcement about the WaterSense H2Otel Challenge.
- Announcements of new publications and resources of interest to GLRPPR membership, including new P2 Impact columns on GreenBiz.com.

Maintaining the infrastructure for the P2Rx network requires a set of core functions for which each center is responsible. Center administrators and coordinators also contribute to the life of P2Rx as a network by participating in monthly conference calls, serving on committees, and attending annual face-to-face meetings. During the project period, GLRPPR performed the following functions to operate as a P2Rx Center:

- P2Rx Center Maintenance
  - Routine maintenance of Topic Hubs and Programs database: Replaced or eliminated broken or obsolete links
  - Participated in eight P2Rx Admin calls
  - News: Displayed the national news box
- P2Rx Center Administration
  - Quarterly reporting to EPA headquarters project officer as requested
- P2 Results Data System
  - Sent out a reminder about the call for 2012 data. The submission due date was extended to March 15, 2014.
- Marketing: Continued to implement marketing committee recommendations
  - Laura Barnes currently serves on the marketing committee and has developed a LibGuide on social media best practices for use by the P2Rx centers and the larger P2 community.
  - Laura Barnes serves on the P2Rx GreenBiz editorial advisory committee. She reviewed and edited all twelve of the P2 Impact columns published during the project period.
- Maintained a functioning website (see Task 2 for details)
- Attended annual meetings
  - Attended the annual P2Rx Center Directors meeting in San Francisco in March 2014 and will attend the meeting scheduled for March 2015 in Denver.
- Rapid response (the number of requests received is listed in the Activity Measures below).

In March 2012, P2Rx began contributing to GreenBiz.com by writing a monthly column centered on pollution prevention. GLRPPR has promoted the P2 Impact (formerly P2 Pathways) column (available at http://www.greenbiz.com/business/engage/enterprise-blogs/p2-pathways) on the GLRPPR blog (http://www.glrppr.org/blog), its Facebook page (https://www.facebook.com/GLRPPR), and Twitter feed (@glrppr). Laura Barnes also has publicized the column on her Environmental News Bits blog (http://envnewsbits.wordpress.com). Three of the columns that appeared during the project period were written by staff from the Illinois Sustainable Technology Center. Laura Barnes continues to encourage programs in the region to write about their P2 practices.

Figure 1: Unique Topic Hub Page Views May 2013-April 2014
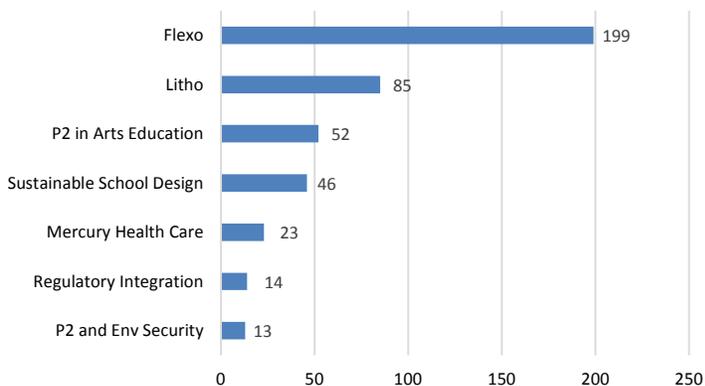
After prolonged discussion among the P2Rx Center Directors in 2011, each Center was asked to identify which hubs would remain active and which would be archived. GLRPPR chose to archive all twelve of their topic hubs and convert them to LibGuides, which are easier to update, more visible to the University of Illinois community, and make it easier to incorporate feedback mechanisms and multi-media. These LibGuides are discussed in detail in Task 2. During the project period, GLRPPR staff evaluated Google Analytics data (Figure 1) and completed conversion of five of the remaining hubs to LibGuides. Based on an analysis of Google Analytics data and conversations with representatives of several of the region's technical assistance providers (TAPs) about their continued relevance, GLRPPR staff decided not to convert the P2 and Environmental Security and Regulatory Integration topic hubs.

GLRPPR cooperates with other P2Rx centers on specific projects. During the project period, GLRPPR contributed 39 case studies from Region 5 to ZeroWasteNet's case study database. These included success stories gleaned from past winners of ISTC's Governor's Sustainability Awards and case studies from Michigan DEQ's Pollution Prevention Program. During the next project period, GLRPPR will continue to solicit case studies and success story contributions from other regional technical assistance programs and facilitate their inclusion in the database. By contributing regional case studies, GLRPPR syndicates the sustainability work being done within the region to help TAPs and companies in other regions meet their sustainability challenges.

WSPPN has made available its P2-101 and Green Chemistry 101 video modules, which GLRPPR has embedded into the Pollution Prevention 101 LibGuide. Other work related to videos is described in Task 2.

Finally, the GLRPPR Executive Director Laura Barnes manages the Google Group for P2Rx Administrators, and the e-mail list for the P2Rx web team, as well as P2Tech, the long-running pollution prevention e-mail discussion list. She also chairs the P2Rx Content and Technology Committee.

Task 2: Redesign and continue to develop content for the GLRPPR web site

During the reporting period, GLRPPR contracted with MacMedia, a local web design firm that is a certified University contractor, to complete GLRPPR's web site redesign. This work includes updating the GLRPPR logo and GLRPPR's MailChimp and blog templates to match the new web identity and ensure that all of GLRPPR's information materials have a similar look and feel. To date, MacMedia has provided several options for a new logo and a site map of the current site for GLRPPR staff and ISTC's web developer to

review in order to make changes to the site's content and navigation structure. MacMedia delivered CSS and template pages for the new web site in August 2014, as well as header graphics, which have been implemented on GLRPPR's social media accounts and MailChimp products.

ISTC's web development team is in the process of migrating the site from Cold Fusion 9 to Cold Fusion 11. During this process, GLRPPR's executive director and the web development team are also reviewing the nearly 900 pages on the existing site to determine whether they should move to the new site. ISTC's web developer is also modifying Cold Fusion code to improve the web site's functionality. We have made significant progress on this task, but are still working to complete it. We anticipate that the new site will be live by June 2015.

During the project period, GLRPRR staff checked all of the links included in GLRPPR's Sector Resources collection, correcting broken links and deleting any records that couldn't be fixed. In addition, they are conducting a comprehensive gap analysis of existing sectors to locate more recent information for sparsely populated sectors. Finally, they reorganized several sectors that had an overwhelming number of links. They changed the name of the Outdoor Recreation sector to Green Sports (Outdoor Recreation is now a subcategory) and added several subcategories to the Retail/Commercial Sector Resource, including Supply Chain Management and Green Business. This type of maintenance should be ongoing, but had been neglected for several years because of staffing shortages. Having an hourly employee working on the project should enable GLRPPR staff to keep up with link checks and other changes to make sector resources more usable for visitors to the web site.

GLRPPR distributes a great deal of information through its web site (http://www.glrppr.org) and social media accounts. Services available through the web site include a blog, sector resources and topic hubs, an event calendar, funding opportunities, a help desk librarian service, and a contacts database. Web analytics for October 2013-January 2014 are included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant. Web analytics for February-September 2014 appear in Table 1 below. Analytics for October-December 2014 will be reported in the progress report for GLRPPR's next project period (October 2014-April 2015).

Table 1: GLRPPR Web Site Analytics			
Site visits and visitors			
	Feb-Mar 2014	**Apr-Sep 2014**	**TOTAL**
Total site visits	3,036	6,603	9,639
Total page views	5,504	13,791	19,295
New visitors	2,709	5,300	8,009
Returning visitors	420	1,303	1,723
Site traffic sources			
Search engines	65.12%	62.05%	
Direct access	16.44%	16.57%	
Referrals from other sites	8.76%	9.28%	
epa.gov (# of sessions)	36	59	95
istc.illinois.edu (# of sessions)	28	74	102
P2Rx.org ((# of sessions)	11	54	65
E-mail (MailChimp)	5.70%	7.88%	
Social media	0.53%	1.41%	
Twitter (# of sessions)	14	82	96
Facebook (# of sessions)	2	7	9

A detailed examination of Google Analytics data revealed that several referrals were coming via the City of Grand Ledge, MI web site. Further investigation showed that the source of these referrals is a fact sheet

developed by the Greater Lansing Regional Committee for Stormwater Management entitled "Top Things We Can Do To Protect Our Watersheds" (http://grand-ledge.com/pdf/GLRC.TopTenThings.pdf). The fact sheet links to the Landscaping Topic Hub on the GLRPPR web site.

GLRPPR uses MailChimp (http://www.mailchimp.com) to publish a twice weekly newsletter to highlight new publications, events, funding opportunities, blog posts, and news items added to the GLRPPR web site. Each newsletter is archived on the GLRPPR web site at http://www.glrppr.org/newsletter. GLRPPR also publishes a monthly newsletter to highlight upcoming training opportunities, conferences, and webinars. MailChimp analytics for October 2013-January 2014 are included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant.

The 79 newsletters sent from February-September 2014 generated 693 visits to the GLRPPR web site (7.19% of total site traffic), with an average visit duration of 102 seconds (the site average for the period was 85 seconds). The twice-weekly newsletters sent from February-September 2014 had an average open rate of 15.83% and an average click rate of 5.06%. The events newsletters had an open rate of 16.09% and a click rate of 5.10%. MailChimp's average for the educational industry is an 18.8% open rate and 3.0% click rate. The web site update mailing is sent to 318 subscribers and the monthly events mailing is sent to 844 subscribers.

The electronic newsletter is a valuable tool for broadening GLRPPR's reach to more widely disseminate P2 information. Nancy Holm, who organizes ISTC's Sustainability Seminar Series, forwarded e-mail correspondence that she had with David Swanson, an EMS consultant working for the U.S. Air Force. He inquired about whether a particular webinar in that series had been recorded for later viewing and mentioned that he was trying to view it from Japan. She replied and asked him where he'd heard about the webinar. He wrote, "I believe I got wind of it via the Great Lakes P2 organization. Back in the day I started the P2 program in Boulder, CO. I'm now an EMS consultant to the US Air Forces in the Pacific based out of Hawaii. I just happen to be in Japan for 3 weeks assisting AF bases implement their EMS and also auditing other bases. I still like to try and keep up on the latest in the EMS/P2/Sustainability world!" With the web site and other virtual communication tools, including social media, GLRPPR has expanded its reach all the way to Japan.

GLRPPR has three collections in the University of Illinois' IDEALS repository. Links to the collections are included on the GLRPPR web site. The Presentations collection (https://www.ideals.illinois.edu/handle/2142/33745) includes PDFs of slide decks from GLRPPR webinar presenters. There are currently nine documents in this collection. There have been 391 downloads from this collection from February-September 2014. There were 473 downloads from GLRPPR's print newsletter IDEALS collection (https://www.ideals.illinois.edu/handle/2142/695) during the same period. The collection contains 31 documents. IDEALS analytics for October 2013-January 2014 are included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant. During this project period, GLRPPR staff created a collection for progress and annual reports (https://www.ideals.illinois.edu/handle/2142/48720). There are currently three reports in the collection, which had 63 downloads. We will continue to add reports to this collection to help keep our members informed about our efforts.

During the project period, GLRPPR created a YouTube channel (https://www.youtube.com/user/glrppr) and uploaded its archived webinars to the site. Analytics appear in Table 2 below. Laura Barnes has also created a playlist of videos from the 2013 International Sustainable Electronics Competition, which are available from GLRPPR's YouTube page (https://www.youtube.com/user/glrppr/playlists). The playlist was viewed six times during the project period. In the upcoming project period, GLRPPR staff will create playlists related to its four focus areas. Embedded videos and playlists will also be prominently featured on GLRPPR's new web site when it goes live.

Table 2: Views on GLRPPR YouTube Channel by Video	
Video	**Views**
Using EPA's P2 Cost & GHG Calculators to Measure Environmental Outcomes	**86**
Beyond Energy Efficiency: Behavior Change Tactics for the Pollution Prevention Community	**35**
Pollution Prevention Information: What's Out There and Where to Find It	**33**
Using the TRI P2 Data Tool	**27**
Illinois Conservation of Resources and Energy (ICORE)	**16**
E3 in Agriculture -- Montana's Experience	**11**
TOTAL	**208**

Blog posts and items added to news, events, and sector resources are also distributed through GLRPPR's Facebook and Twitter feeds. There are currently 85 people following GLRPPR on Facebook and 292 on Twitter. Topics of blog posts ranged from funding opportunities to webinar announcements to information about new resources relevant to the P2 TAP community. Many blog posts are also forwarded to the Roundtable e-mail list. Posts during February-September 2014 that are relevant to GLRPPR's focus areas are listed in Appendix B. Posts from October 2013-January 2014 are included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant. Posts from October-December 2014 will be reported in our next progress report.

Statistics for the number of specific items added to GLRPPR's web site from February-September 2014 appear in Table 3 below.

Table 3: New Content Posted to GLRPPR Web Site	
News items	428
Blog posts	26
Events added	93
Funding opportunities added	7
Help desk questions answered (feedback received indicated that information was useful in all cases)	16
Items added to sector resources	329

LibGuides is a tool that the University of Illinois Library provides for developing web-based subject guides. Several years ago, GLRPPR converted several of its topic hubs to LibGuides to demonstrate the value of the tool to other P2Rx Centers. During the project period, GLRPPR's remaining Topic Hubs (with the exception of two – see Task 1 for discussion) were converted to LibGuides. They are available at http://uiuc.libguides.com/profile.php?uid=13195. Links to the converted guides are included on http://www.glrppr.org/hubs to direct users to the updated content. During the project period, Laura Barnes collaborated with Susan Braxton, head librarian at the University of Illinois' Prairie Research Institute, to develop a LibGuide focused on resources to help cities mitigate and adapt to climate change. Usage statistics for GLRPPR's LibGuides for February-September 2014 appear below. Statistics for October 2013-January 2014 are included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant. Statistics for October-December 2014 will be included in the next progress report.

Table 4: GLRPPR LibGuide (Topic Hub) Analytics	
Guide	**Views**
Auto Salvage-Great Lakes Region Topic Hub	145
Energy Efficient Schools and Students Topic Hub	35
Integrated Pest Management (IPM) in Schools Topic Hub	89
Mercury -- Schools Topic Hub	5
Mercury-Health Care Topic Hub	21
Pollution Prevention 101	352
Pollution Prevention for Arts Education Topic Hub	24
Printing -- Flexography Topic Hub	66
Printing -- Lithography Topic Hub	58
Resilient Cities	304
Social Media Best Practices	356
Sustainable School Design Topic Hub	51
Technology Diffusion Topic Hub	61
TOTAL	**1567**

Laura Barnes has also developed a number of LibGuides in her role as a librarian for the Prairie Research Institute. Links to these guides are included in the appropriate sector resources on the GLRPPR web site and on the Topic Hubs page (http://www.glrppr.org/hubs). They can also be viewed at http://uiuc.libguides.com/profile.php?uid=1048.

GLRPPR established three focus areas in February 2012, which continued for this project period. At the beginning of this project period, GLRPPR added Green Chemistry/Engineering as a fourth focus area. GLRPPR's activities in these focus areas are described in detail in Task 3. One goal of the GLRPPR web site redesign is to better highlight regional projects and resources in these areas.

During the next project period, Laura Barnes will develop two new LibGuides on sustainability topics, most likely on Green Chemistry/Engineering and either Zero Waste or Behavior Change and Sustainability. GLRPPR will also continue to upload its archived webinars to YouTube and display them prominently on the redesigned web site. In addition, GLRPPR will continue to promote other videos of interest to the region's sustainability professionals.

Task 3: Assess regional P2 information needs and develop information resources and training to fill identified gaps

Focus areas

This section describes GLRPPR's activities in each focus area. The GLRPPR Blog included several posts relevant to each focus area. These posts were distributed through the Roundtable e-mail list and in GLRPPR's twice-weekly MailChimp newsletter. Details of posts for each focus area for the period February-September 2014 are found in Appendix A. Because three of the focus areas are continued from the previous funding cycle, posts on those topics for October 2013-January 2014 were included in the progress report dated August 2013-January 2014, which was submitted as part of our previous grant. Posts written from October-December 2014 will be detailed in the progress report for the next project period.

Technical Assistance

The Technical Assistance focus area provides a way for TAPs throughout the region to share success stories and lessons learned, leverage resources, learn from each other, and expand their reach.

In March 2014, Christine Anderson and Donna Twickler approached GLRPPR about hosting an EPA webinar entitled "Using EPA's Pollution Prevention Greenhouse Gas and Cost Calculators to Measure Environmental Outcomes." The webinar, which was held on June 18, 2014, featured Natalie Hummel and Kathy Davey discussing these tools and how companies and TAPs can use them to measure environmental outcomes.

GLRPPR also hosted a webinar on E3 in Agriculture on June 5, 2014. The presenter was Myla Kelly of Peaks to Prairies Pollution Prevention Information Center (the P2Rx Center for Region 8). Through a P2 grant from U.S. EPA Region 8, Peaks staff trained six University of Montana Agricultural Extension educators so that they could conduct E3 assessments with producers in their county. Their model should be readily transferable to TAPs in Great Lakes states. Outcomes and reports from the Montana project are available at http://e3.peakstoprairies.org/project-outcomes-and-reports/.

The archived webinar, slides, and related links for both webinars are available at http://www.glrppr.org/meetings/#Webinars. Webinar analytics are included in Appendix B.

During the project period, Laura Barnes collaborated with Susan Braxton, head librarian at the University of Illinois' Prairie Research Institute, to develop a LibGuide focused on resources to help cities mitigate and adapt to climate change. The content in this guide provides information that will help advance EPA's new national priorities of climate change mitigation and community-focused efforts. The Minnesota Pollution Control Agency has linked to the LibGuide from http://www.pca.state.mn.us/index.php/topics/preventing-waste-and-pollution/sustainability/community-resilience.html.

In September 2014, Laura Barnes attended the Indiana Partners for Pollution Prevention Conference. During that conference, she spoke to the companies participating in the Indiana Department of Environmental Management's (IDEM) Environmental Stewardship Program about strategies and resources for effectively finding pollution prevention information.

GLRPPR featured a number of posts on its blog related to this focus area. A complete list is available in Appendix A. Laura Barnes also routinely forwards messages of interest to P2 TAPs to the Roundtable e-mail list.

Sustainable Electronics

GLRPPR partners with another ISTC project, the Sustainable Electronics Initiative (SEI), for this focus area.

Because both SEI and GLRPPR are ISTC projects with web sites hosted on the same server, the two projects frequently share content related to sustainable electronics. Joy Scrogum, SEI Coordinator, and Laura Barnes cooperate to post sustainable electronics news articles, events, and resources to both sites as appropriate. These site additions are regularly promoted to GLRPPR members via RSS feeds, which help populate the GLRPPR e-newsletters with content. SEI blog posts are also distributed through GLRPPR's social media channels and included in GLRPPR's e-newsletter.

SEI hosted five Sustainable Electronics Campus Consortium meetings for the University of Illinois at Urbana-Champaign during this report period; local GLRPPR members were encouraged to participate. See http://www.sustainelectronics.illinois.edu/services/campusconsortium.cfm for dates and meeting synopses. Campus consortium meetings and associated webinars were shared with GLRPPR members via the GLRPPR web site and e-newsletters.

During the Spring 2014 semester, SEI staff taught a class, entitled ENG/TE 498: Sustainable Technology: Environmental and Social Impacts of Innovations. The class was part of the University's Technology Entrepreneur Center offerings and was cross-listed as an Engineering class. The following are guest lecturers who were invited to participate in the ENG/TE 498 class:

- Craig Boswell, President, HOBI International, Inc., 2/3/14, in person
- Wayne Rifer, Director of Research and Solutions , EPEAT & Green Electronics Council, 2/10/14, remote presentation
- Kyle Wiens, CEO, iFixit & Dozuki, 3/10/14, remote presentation
- Emily Knox, UI professor in GSLIS, 3/17/14, in person (speaking on Makerspace Urbana)
- Lynn Rubinstein, Executive Director, Northeast Recycling Council and Program Manager, State Electronics Challenge and Carol Baroudi, Global Sustainability and Compliance, Arrow Value Recovery, 4/7/14, in person
- Jason Linnell, Executive Director, National Center for Electronics Recycling (NCER), 4/14/14, in person
- Sriraam Chandrasekaran, Visiting Research and Development Engineer, ISTC, 4/21/14, in person

In March, ISTC staff met with Katie Kinley, a University of Illinois student who entered the 2013 International Sustainable Electronics Competition. She developed a microphone battery pack charger that may reduce battery waste at the University. During the meeting, they discussed potential development and testing of her concept. ISTC decided to fund her proposed "pilot study" and had her present her concept at the April meeting of the Sustainable Electronics Campus Consortium to connect her with key campus instructional technology personnel who might assist her in the testing of her prototype.

Unfortunately, the battery pack design failed. CITES Educational Technologies group agreed to let her run a pilot program in a couple of the lecture halls they oversee. However, upon closer examination of the cost estimates, they decided that her purchasing data was incorrect and that the predicted cost savings would not really be significant. They were still willing to allow her to prove the design concept in their facilities. However, Katie left campus after graduation to begin a new job and did not complete necessary repairs to the unit before leaving. When she returned the unit to ISTC, SEI staff discovered that it was not charging properly on the cradle, due to a design flaw related to pushing the battery into place. Although it appeared that the flaw could be fixed with modification to her 3-D print file, the batteries in the modified pack wouldn't recharge, even with the new 3-D printed pieces. Because the whole point of the modification was to enable the pack to use rechargeable batteries, the unmodified pack was returned to CITES. SEI has no plans to continue pursuing the microphone inductive charging project.

SEI staff met with Lynn Rubinstein and Carol Baroudi to discuss development of a sustainable electronics policy on the University of Illinois campus. Although no specific outcomes have resulted from this meeting, SEI/ISTC continues to push for more sustainable electronics policies and procedures on campus.

The University of Illinois participated in Ecyclemania on March 18, 2014, as part of the University's Recyclemania efforts. ISTC, SEI, and GLRPPR helped promote the event via blogs, the ENG/TE 498 class "Sustainable Technology: Environmental and Social Impacts of Innovations," and at the March consortium meeting. ISTC was the vehicle drop-off site for the event and provided personnel to assist with drop-offs. According to a post-event email from Bart Bartels, the University's Zero Waste Coordinator, the campus collected a total of 13,870 pounds of e-waste.

Joy Scrogum gave a lightning talk on sustainable electronics and education for sustainability at the Prairie Lightning Symposium on March 20, 2014. She also presented a poster during the poster session that

promoted ISTC's sustainability film festival, which included a screening of *Terra Blight*, a documentary about e-waste. She also promoted the film festival at the UI Public Engagement Symposium on March 11, 2014.

ISTC hosted a Sustainability Film Festival at UIUC on April 22-24, 2014. Films screened included *Living Downstream*, *Waste = Food*, and *Terra Blight*, the latter of which focuses on e-waste issues. From the film's web site:

> "The film traces the life cycle of computers from creation to disposal and juxtaposes the disparate worlds that have computers as their center. From a 13-year-old Ghanaian who smashes obsolete monitors to salvage copper to a 3,000-person video game party in Texas, *Terra Blight* examines the unseen realities of one of the most ubiquitous toxic wastes on our planet. This documentary examines the intricacies of American consumerism through the story of the computer. It exposes some of the harms of its existence, but it also celebrates the positive changes it has brought to us. By the film's end, the audience will never look at their computer the same way again."

Joy Scrogum hosted the festival and discussed relevant SEI and GLRPPR resources during audience discussion sessions. The festival and film screening times were promoted to GLRPPR members via its online calendar and e-newsletters. Scrogum collaborated with Laura Barnes on the creation of a LibGuide with resources pertinent to each film's subject matter (http://uiuc.libguides.com/sustainability-films-2014). The LibGuide was promoted to GLRPPR members via e-newsletters. Local experts participated in discussion and Q&A sessions after each film. For *Terra Blight*, the following individuals participated in the after-film discussion:

- William Bullock, Professor of Industrial Design, School of Art + Design, Affiliated Faculty Scientist ISTC, Director, Product Innovation Research Lab.
- Susan Monte, Champaign County Recycling Coordinator, Champaign County Regional Planning Commission.
- Courtney Rushforth, Recycling Coordinator, City of Urbana.
- Dave Walters, Manager, Waste Reduction and Compliance Section, IL Environmental Protection Agency Bureau of Land.

During Pollution Prevention Week 2014, Joy Scrogum published two posts related to sustainable electronics on the GLRPPR Blog. She also wrote 16 blog posts for the SEI blog during the project period. Posts from the SEI Blog are included in GLRPPR's weekly e-newsletter. A list of blog posts by focus area appears in Appendix A.

SEI and GLRPPR staff collaborated to arrange a webinar about the State Electronics Challenge. This was held on November 18, 2014, and was presented by Lynn Rubenstein. Feedback from attendees will be reported in GLRPPR's next project report.

Joy Scrogum attended the Illinois Electronics Summit on April 29. At that meeting, Susan Monte reported on the County Electronics Recycling Survey that she conducted with funding from ISTC. Presentations from the meeting are available online at http://www.ilcswma.org/training/.

Social Science and Behavior Change

This focus area provides a forum for the discussion of social science research as it relates to pollution prevention. This topic is of great interest to the other P2Rx Centers and to the GLRPPR membership.

Although GLRPPR did not host any webinars on this topic during the project period, staff promoted several related webinars, including ACEEE's SEE Behavior Change webinar series.

During the project period, GLRPPR staff developed a new sector resource on Behavior Change and Sustainability (http://www.glrppr.org/contacts/gltopichub.cfm?sectorid=152), which includes links to resources on consumer behavior, employee engagement, energy efficiency programs, measurement, research articles, and tools. GLRPPR staff also added Behavior Change subcategories in the Consumer Information & Resources, Educational Institution, Energy Efficiency, and Local Government sector resources. They also added an Employee Engagement subcategory to the Retail/Commercial sector resource. During the next project period, GLRPPR staff will continue to add content to these collections, as well as develop a LibGuide to support the focus area.

Green Chemistry/Engineering

During the reporting period, under a GLRI subcontract to the National Pollution Prevention Roundtable (NPPR), GLRPPR assisted with organization and promotion of the 2014 Great Lakes Green Chemistry Conference. The conference was held in Cleveland on April 1-3, 2014. It included GreenSCREEN training.

GLRPPR continued to promote webinars for NPPR's Safer Chemistry Challenge Program, the Great Lakes Green Chemistry Network, the Michigan Green Chemistry Clearinghouse, and the American Chemical Society.

In March 2014, Laura Barnes spoke with Chris Affeldt about the Michigan Department of Environmental Quality's Green Labs project. GLRPPR and Michigan DEQ staff corresponded about developing a blog post on the project and are still working to make that happen. They will also discuss the possibility of making any training materials developed for the project available to organizations throughout the region.

GLRPPR worked with the Minnesota Pollution Control Agency to distribute information about their green chemistry projects. Laura Barnes created a Storify article entitled "PAH Pollution from Coal Tar Sealants" (https://storify.com/lbarnes/pah-pollution-from-coal-tar-sealants), which identifies current research and highlights MPCA's efforts to encourage communities to use less toxic alternatives. The story has 115 views to date. GLRPPR continues to work with MPCA to distribute information on their other green chemistry efforts and has published blog posts on several of them during the project period.

During the next project period, GLRPPR will develop a Green Chemistry/Green Engineering LibGuide, continue to promote green chemistry/engineering training opportunities, and facilitate one webinar, possibly on Michigan's Green Labs project. We are also ensuring that green chemistry and green engineering topics are included in the proposed joint pollution prevention roundtable meeting with P2RIC, the Region 7 P2Rx Center.

Needs assessment

Because GLRPPR's focus areas are very broad, we proposed to conduct a regional information needs assessment during this project period. The assessment was designed to determine how technical assistance providers in the region currently locate and access information; how they stay up-to-date in the field; how they prefer to receive training; and what training and information gaps exist within these broad focus areas.
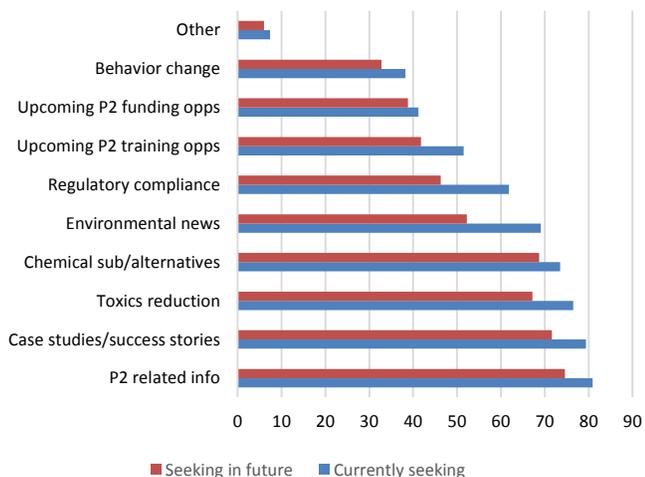
GLRPPR contracted with the University of Illinois' Survey Research Laboratory (SRL) to conduct the needs assessment. The SRL is a campus unit that has the expertise needed to complete the assessment quickly and effectively. GLRPPR staff worked with the SRL project manager to develop an assessment instrument, obtain Institutional Research Board approval, and encourage GLRPPR members to respond to the request to provide feedback. The web-based feedback instrument was launched in early March and closed on May 7. The full report is included in Appendix C. The remainder of this section presents an executive summary of the findings.

A link to the survey was sent to the 408 people subscribed to the Roundtable e-mail list and e-newsletter. Of those, 65 completed the questionnaire and 3 partially completed it, which is a 16.6% response rate. Respondent demographics were: 59.4% from some type of government agency; 12.5% from universities; 7.8% each from private companies and non-profit organizations; and 69.3% from states in the Great Lakes Region.

64.7% of respondents seek information on P2 or waste reduction as part of their job duties. 30.9% seek this information as part of their job duties **and** for some other reason. Themes that emerged from respondents who specified a reason included: curiosity about or interest in the field; up-to-date information;

Figure 2: Types of information sought (by %)

care about the environment; reducing pollution, toxics at home; interest in personal or public health issues; and building projects and lawn and garden care. Types of information that people often seek are shown in Figure 2. These data indicate that making it easier to locate case studies on the GLRPPR site should be a priority. They also support the decision to make Green Chemistry/Engineering a focus area.

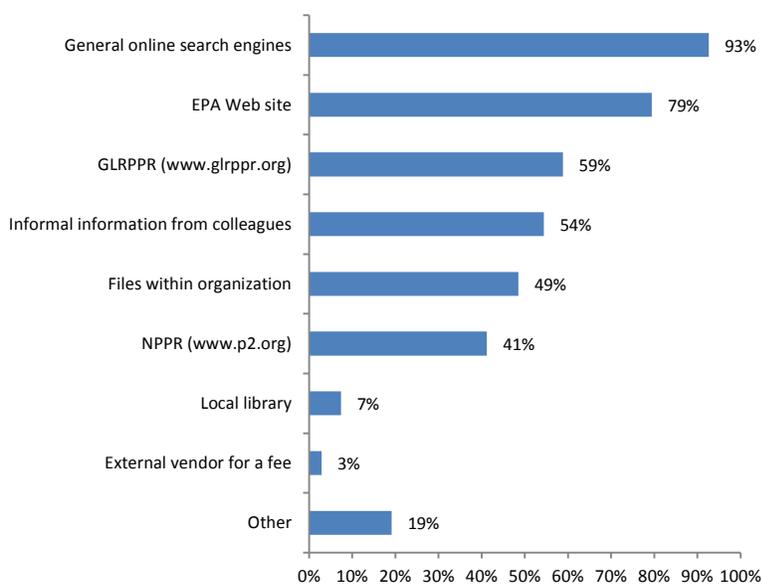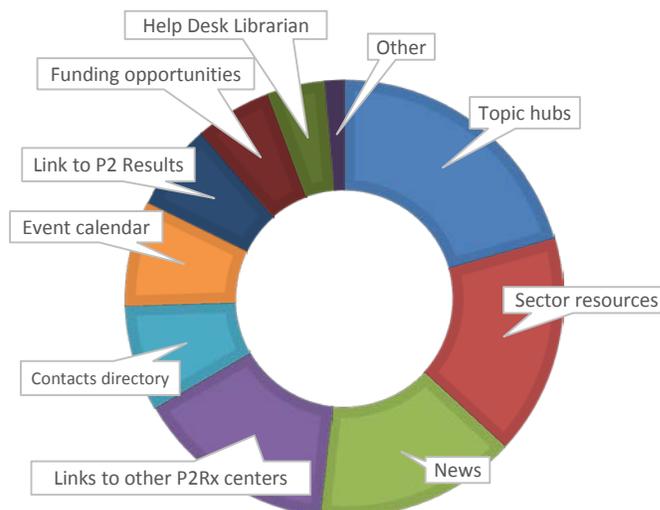**Figure 3: Sources Used to Look for P2 Information**

Figure 3 illustrates where respondents most often go when they seek P2 information. The GLRPPR web site ranks third after general search engines and the U.S. EPA web site. The Other category includes: Pollution Prevention Resource Exchange - P2Rx (3 mentions); Environmental publications and newsletters; FedCenter; free vendor info; serdp.org; tech blogs; GreenBiz; GLRPPR newsletter; Grant monies for air quality through DERA or CMAQ; P2 Info House; PPRC; State Regulatory Programs; Industry Associations; local technical assistance/P2 provider – MNTAP; sustainability resources (1 mention each).

Respondents who said that they used GLRPPR as an information source were asked about the types of information they sought in the past. The top three resources identified were topic hubs, sector resources, and news. Figure 4 shows the percentage of respondents who used each service. These data indicate that continuing to update LibGuides and Sector Resources is a priority.

Respondents were also asked to identify barriers faced while trying to find information, regardless of source used. They were allowed to select as many responses as applied. 49.3% reported that they couldn't find any information on their topic of interest; 40.3% reported only finding incomplete information on the topic; 37.3% reported finding too much information to sift through; 34.3% reported a lack of good quality information; 19.4% said that they didn't know who to contact when they couldn't find information; and 35.4% reported experiencing no issues. When asked to recall the last time they had tried to find information about pollution prevention or waste reduction, a little over half of all respondents indicated that they were unable to find all the information they needed. This number was higher for those frequently seeking information. These results indicate that GLRPPR should better publicize P2Tech and the Help Desk Librarian service so that people know where to go for assistance. Furthermore, it appears that training on locating different types of P2 information may also be useful.

Figure 4: Types of information sought on GLRPPR web site

Figure 5: Suggested topics for training
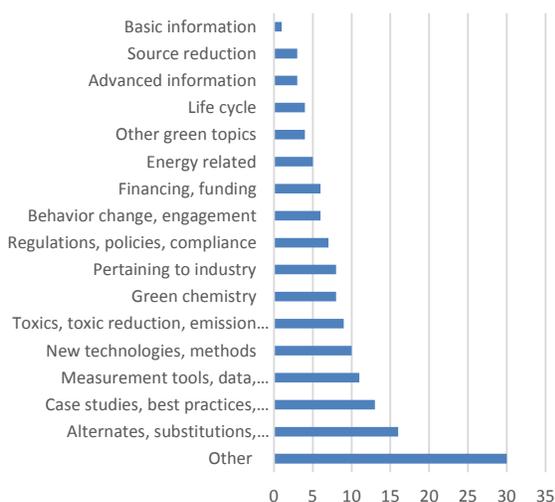
Finally, respondents were asked to rate their likelihood, on a scale of 1-5 (1=Not Likely, 5=Extremely Likely), of participating in a training seminar about pollution prevention or waste reduction if it was offered in a variety of formats. The webinar and online training taken at one's own pace were the most popular options (mean ratings = 3.84 and 3.28, respectively, for all respondents). Even so, the mean likelihood ratings for taking part in training offered in these formats are less than 4.0 ("very likely"). Frequent information seekers reported greater likelihood of taking part in trainings in all formats as compared to non-frequent information seekers. None of the other format options yielded a likelihood of taking part that was high or even moderate. Figure 5 shows the topics on which respondents indicated that training would be useful. Detailed information about topics of interest is included in Appendix C of the final needs assessment report.

In future funding cycles, GLRPPR will use this information to develop training (primarily webinars and asynchronous training modules) and other information tools to fill gaps identified by the assessment responses.

Task 4: Facilitate regional networking and information exchange

GLRPPR held a half-day meeting on March 31, 2014, one day prior to the Great Lakes Green Chemistry Conference in Cleveland, OH. It was attended by sixteen people from state TAPs and companies in the Great Lakes region. NPPR's Executive Director also attended. The meeting allowed NPPR staff and the region's technical assistance providers to have a candid discussion about regional projects, potential partnerships, and ways that GLRPPR, NPPR, and sustainability professionals from the region can work together. Several people commented during and after the meeting that being in the same room together leads to very productive conversations. They also said that webinars are great for learning about projects, but that face-to-face meetings are more productive for trying to form partnerships. Attendees agreed that annual face-to-face meetings are very important to them.

During the next project period, GLRPPR will hold a joint conference in 2015 in collaboration with P2RIC, the Region 7 P2Rx Center. The conference will be held in St. Louis from March 31-April 2, 2015. In future funding cycles, GLRPPR will continue to organize annual in-person meetings designed to facilitate discussion and collaboration among the region's technical assistance programs.

Appendix A: Blog posts by focus area

Technical Assistance
- WaterSense H2Otel Challenge Webinars
- EPA proposes new rule regulating mercury in dental amalgam effluent
- New LibGuides available: Focus on resilient cities, environmental law
- National P2 Roundtable offers P2 101 training as three-webinar series
- Three Tips on the Road to a Great Governor's Award Application

Sustainable Electronics (posted to the SEI Blog and distributed through GLRPPR e-newsletter and social media channels)
- 5 Source Reduction Tips for Electronics Consumers
- Burning Need: The Search for Less-toxic Flame Retardants
- Reminder: Champaign County Electronics Recycling Event, April 12, 2014
- ISTC Sustainability Film Festival Includes Terra Blight
- Recent Sustainable Electronics Headlines
- Game Consoles & Energy Efficiency–Level Failed?
- Photo Essay Offers View of Village Where Beijing's E-Waste Accumulates
- ENG/TE 498 Student Projects: NEO Extends Smartphone Life, Facilitates STEM Education
- UI Sustainable Electronics Campus Consortium: The iFixit Technical Writing Project
- Your Browser and Your Battery, or, Are You Wasting Time AND Power on the Internet?
- How to Use the EPEAT Registry to Purchase Greener Electronics–Archived Webinar
- Strange Magic: Electric Waste Orchestra Combines DIY, Music, and Creative Reuse of Electronics
- Recent Headlines: Occupational Risks for US Electronics Recyclers; Counterfeit Electronics; & Tracking E-waste Exports
- US Federal Legislation Page Updated on SEI Web Site
- Kill Switch Info Added to U.S. State & Local Legislation Page
- Champaign County Options for Electronics Recycling & Reuse
- Pollution Prevention Week: E-waste and the World's Most Polluted Places
- UI Sustainable Electronics Campus Consortium: BC Green Initiative Recycles Printer Cartridges

Social Science and Behavior Change
- Sustainability and behavior change article roundup
- Behavior change and pollution prevention
- New sector resource for Behavior Change & Sustainability
- Two upcoming webinars in the P2Rx Behavior Change Webinar Series
- Sustainability Awareness Promoted by Major Music Festivals in the Great Lakes Region

Green Chemistry/Engineering (posts for October 2013-September 2014 because focus area was added during this project period)
- Washington State Department of Ecology resources on chemicals in consumer products
- 2014 Michigan Green Chemistry Governor's Awards nominations open for innovative projects
- Presidential Green Chemistry Challenge Awards Accepting Nominations through April 30, 2014
- Registration now open for the 2014 Great Lakes Green Chemistry Conference
- Minnesota Pollution Control Agency publishes green chemistry case studies

- [U.S. EPA Region 5 hosts one-day green chemistry/green engineering training](#)
- [Minnesota 2012-2013 Green Chemistry and Design College Curriculum Grant Projects](#)
- [Use of Formaldehyde and HBCD in Minnesota](#)

APPENDIX B: Post-webinar Analytics

GoToWebinar

GoToWebinar, which GLRPPR uses to broadcast its webinars, provides a post-webinar attendee report which includes data on rates of participant attention. The Interest Rating is a statistic that allows organizers to benchmark and qualify attendee interest in a webinar. Interest Ratings are computed from a proprietary algorithm that evaluates each webinar attendee's interactions on a scale of 1 to 100 (100 being best). Factors that contribute to the Interest Rating include, but are not limited to: attendance length, attentiveness during the session, number of questions asked, and an attendee's successful completion of polls, surveys, and registration. The average interest rating for each webinar appears below.

Webinars that were part of ISTC's Sustainability Seminar Series did not include a post-webinar evaluation. GLRPPR-sponsored webinars did include a post-webinar evaluation. Those results are included in the next section. In-person and online attendance figures are listed below. The corresponding focus area is indicated in parentheses after the webinar title (TA=Technical assistance; SE=Sustainable Electronics; BC=Behavior Change; GC=Green Chemistry).

Webinar Title	Attended In-Person	Attended Online	Interest Rating
Protecting Illinois' Environment through Policy and Advocacy (TA)	30	15	Not available
Beyond RFS and MPG: Promoting Cleaner Trucking Services (TA)	14	4	Not available
The Realities of Energy in Illinois and Beyond "It's much more interesting than you think." (TA)	19	8	67.75
Illinois EPA: Sustainability Practices for Air, Water and Land Protection (TA)	30	3	68.80
The Illinois Coastal Management Program: Enhancing Sustainability of Illinois' Lake Michigan Coast (TA)	20	2	9.50
Orange Going Green: IDOT's Drive Toward Sustainability (TA)	20	10	59.22
Planning for Regional and Local Sustainability (TA)	5	7	42.33
Top 10 Ways EPA Uses the Principles of Sustainability to Accomplish Its Mission (TA)	20	6	49.25
iSEE a Sustainable Campus (TA, BC)	25	3	61.33
Agricultural Plastics: Progress and Barriers in Closing the Loop (TA)	15	4	48.70
Starting a Sustainability Program – Where to Begin (TA, BC)	30	32	42.91
Facilitating Employee Engagement in Sustainability Initiatives (BC)	11	43	36.98
EPA Greenhouse Gas and P2 Calculators (TA)	n/a	91	43.90
E3 in Agriculture (TA)	n/a	28	41.32

Post-webinar evaluations

EPA Greenhouse Gas and P2 Calculators

Ninety-one attendees at the webinar. Seven filled out evaluations for a 7.6% response rate.

Four of the respondents said they were much better informed about the topic than before the webinar; three said they were somewhat better informed. All respondents reported that the speakers were knowledgeable about the material. When asked to rate how informative and engaging they were (on a 1-5 scale, with 1 being the lowest and 5 being the highest), the average was 3.14. Four respondents said that the webinar was useful overall; three said that it was not.

The webinar speakers requested that we ask respondents how they planned to use the calculators in their work. Their answers were:

- "In preparing for Clean Air Act 111(d) guidance, these calculators may be used in determining energy efficiency projects that may be used as a 'carbon credit' or other means."
- "1. In our P2 intern program for having consistent reporting from all interns. 2. In my work with other businesses that what to quantify their environmental impact."
- "I am not sure that I will ever use them, but if I do, it will be to come up with GHG emissions for a particular scenario."
- "Help us predict what projects might save in terms of CO2e and then keep track of our savings in implemented projects."
- "I don't know if I can."
- "Monitor our carbon footprint."
- "To assist businesses and organization with calculation of GHG."

When asked how GLRPPR could improve the webinar, respondents replied:

- "The slides were very handy, but I think showing the calculator on line and doing an actual example live would be just as beneficial - with the slides as backup."
- "This was one of the best webinars I've attended. The voice quality of the moderator and both speakers was very good. It would have been nice to see the calculators in action rather than just screen shots."
- "Perhaps there could have been better graphics to demonstrate what the calculator was doing in the different cases presented, rather than just showing pictures of the spreadsheets."
- "I was not able to view the webinar on the day of broadcast, so I viewed it later. It was a huge headache to get it to work on a Mac! I ended up having to buy an application."
- "It was so boring. Maybe a couple of more examples and how to apply it to different audiences. It seemed a little disorganized, as far as the order of the slides, some lost slides - but in no way was it a bad presentation!"
- "Instead of screen shots, it would have been MUCH more useful to set up an example and then show us how to fill out the calculator based on that scenario. Several different scenarios could have been presented. Screen shots are good for a backup in case of technical difficulty, but the 'live' approach allows for better practical implementation of the tool too."

E3 in Agriculture

Twenty-eight people attended the webinar. Three filled out the evaluation, for an 11% response rate.

All respondents said they were much better informed about the topic than before the webinar. All respondents reported that the speakers were knowledgeable about the material. When asked to rate how informative and engaging they were (on a 1-5 scale, with 1 being the lowest and 5 being the highest), the average was 4.3. All respondents said that the webinar was useful overall.

Two respondents gave feedback on how GLRPPR could improve their webinars:

- "They are pretty good as they are. Perhaps evaluate how easy is to navigate the website for future reference."
- "It was one of the best webinars I've ever attended (and I attend many)."

Appendix C: Survey Research Laboratory Needs Assessment Report

Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) Need Assessment Study

Final Analytic Report

Prepared by
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July 2014
Study #1155

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Introduction

The Survey Research Laboratory (SRL) at the University of Illinois assisted Principal Investigator Laura Barnes, Executive Director of the Great Lakes Regional Pollution Prevention Roundtable (GLRPPR), with a Web-based survey of GLRPPR members to evaluate their needs for information about pollution prevention and waste reduction and to what extent the organization's Web site (http://www.glrppr.org) meets those needs. This document describes the study methodology and presents the study results.

The primary project coordinator for the study was Dr. Sowmya Anand, who assisted with developing the study questionnaire, programmed the instrument for online administration, and managed the data collection. The study protocol was submitted as an exempt protocol to the UIUC Institutional Review Board (IRB) for review and received approval on February 28, 2014 (IRB #14552). The IRB approved two minor modifications involving sending reminders via the GLRPPR listserv on March 26, 2014, and on April 16, 2014, respectively.

Questionnaire Development and Programming. The PI, together with Dr. Anand, drafted the questionnaire for the study. This draft, along with the e-mail invitation and reminder scripts, was reviewed by SRL's Questionnaire Review Committee (QRC), which is composed of SRL staff members appointed by the Director to ensure that all questionnaires administered by SRL follow ethical practices and basic principles of questionnaire construction. No instrument is administered to respondents before approval is obtained from this committee. Several changes to the instrument were suggested by the QRC and incorporated into the final version.

The final survey instrument was programmed by SRL for online administration using surveygizmo.com. The instrument was tested by the PI and SRL staff March 11 and March 12, 2014.

Data Collection. After the IRB approved the study protocol, the PI provided the sample file to SRL, which consisted of all 416 members of GLRPPR. The sample file contained names and e-mail addresses for 251 of the 416 cases and e-mail addresses only for 165 of the 416 cases. Of the 251 cases with names, 8 records were duplicates in that they had the same first and last names with slightly different e-mail addresses (e.g., smith.jane@epa.gov versus smith.jane@epamail.epa.gov) and were deleted based on a search of currently used e-mail domain names. This resulted in a final sample of 243 cases with names and e-mail addresses and 165 without names, for a total of 408 cases.

E-mail invitations to the survey were sent out to the 408 potential respondents on March 13, 2014. Reminders were sent to nonrespondents on March 20, April 1, and on April 21, 2014, and the survey was closed to responses on May 7, 2014. In addition, two reminders to respond were sent to all respondents via the GLRPPR listserv on March 26 and on April 17. Of the 408 potential respondents, 65 completed the questionnaire; 3 completed through the question, "How often do you use [source] to look for information about pollution prevention or waste reduction issues?" and were counted as partially completed questionnaires; 6 respondents clicked on the link but did not complete the questionnaire; 331 never started the questionnaire; and 6 respondents unsubscribed; none of the e-mails sent bounced. As there are no known ineligible cases in the sample, the response rate is calculated as number completed/number of evites sent, which is 16.6% (68/408).[1]

Demographic Profile of Respondents

Respondents were asked several questions about their employment and personal profile, including their employment status, number of years interested in or working on pollution prevention and waste reduction

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[1] Note that the sample with names and e-mail addresses yielded 64 completed questionnaires; the response rate for this subset is 26.3% (64/243).

issues, country and state of residence, and if employed, some details about their organization. Table 1 presents the profile of the respondents with respect to these demographic variables.

Table 1. Characteristics of Respondents

CHARACTERISTIC	%	CHARACTERISTIC	%
Work status (*n* = 65)		Nebraska	1.5
Working full time	86.2	New York	6.2
Working part time	12.3	Ohio	7.7
In school	1.5	Oregon	1.5
Number of years working on or interested in pollution prevention/waste reduction issues (*n* = 64)		Virginia	1.5
		Washington	3.1
Less than 1–5 years	28.1	Wisconsin	6.2
6–10 years	17.2	**Type of organization for which you work (*n* = 64)**	
11–15 years	12.5	Private company	7.8
16–20 years	15.6	Nonprofit organization	7.8
20+ years	26.6	Federal government or government agency	12.5
In which country do you reside? (*n* = 65)		Regional government or government agency	1.6
United States of America	96.9	Local government or government agency	4.7
Canada	3.1	State government or government agency	45.3
State in which work or reside (U.S. residents only; *n* = 61)		Four-year college or university	12.5
Arizona	1.5	Other[2]	7.8
Colorado	1.5	**Number of people who work in your organization at all locations (*n* = 59)**	
District of Columbia	3.1		
Hawaii	1.5	1 to 20	15.3
Illinois	20.0	21 to 600	23.7
Indiana	6.2	601 to 1,000	28.8
Massachusetts	1.5	1,001 to 3,000	22.0
Michigan	13.8	10,000+	6.8
Minnesota	15.4	Other response[3]	3.4
Mississippi	1.5		

Analysis Methods. The questionnaire consisted of questions using several different types of response options.

- Six questions addressing types of information needs, information ever tried to find, and similar were asked using a check-all-that-apply format in which respondents were presented a list of options and asked to select all applicable options.
- Nine questions used five-point scale response options; the scales ranged from "never" to "extremely often," "not at all useful" to "extremely useful," and "not at all likely" to "extremely likely," while a few had other rating scales, such as "not at all easy" to "extremely easy."
  - o Regardless of the response options, the variables range in value from 1 to 5, with 1 indicating the lowest or least favorable response (e.g., "never" or "not at all useful") while 5 indicates the highest or most favorable response option (e.g., "extremely often" or "extremely useful").

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[2] The types of organizations specified were as follows: Federal Government Contractor, a radio station and a public library, public manufacturer of exhaust emission equipment, publicly traded large US company, and Tribal Government.
[3] The response format for this question was open-ended. Other responses provided were as follows: "Many" and "Private."

- In the overall frequencies presented for these items, which include all respondents, these variables are presented as originally coded, with the percent selecting each category displayed as well as the overall mean on the item (the higher the mean, the better the rating).
- There were also two yes-no questions asking respondents if they looked for information for work-related purposes and if they were able to find the information they needed when they looked for it.
- Finally, there were three open-ended questions asking respondents about the topics about which they were looking for information, the topics on which they were unable to find information, and the topics on which they are interested in training opportunities.

Results

The first question on the questionnaire asked how often respondents looked for information about pollution prevention or waste reduction. The majority of the respondents to this survey—58.8%— reported looking for such information "very" or "extremely" often, 38.2% reported looking for information "moderately" often, and only 2.9% reported looking for information "rarely" (see Table 2).

As information needs might be expected to vary with the frequency with which information is sought, results are presented for all respondents and broken out by information-seeking frequency wherever relevant. Respondents who reported seeking information "very" or "extremely" often were combined into a category labeled "Frequent information seekers," and because the number of respondents who report seeking information "rarely" is so small, this category has been combined with those who reported seeking "moderately," and the combined category is labeled "Nonfrequent information seekers."

Information-Seeking Behaviors

Table 3 shows the percentage of respondents who looked for information on pollution prevention and waste reduction for job-related or other reasons, for all respondents and split by frequency of information seeking. Respondents could choose all options that were applicable to them; as there were only two response options, we coded the resulting responses into three categories: (1) those selecting "part of job duties" only, (2) those selecting "some other reason" only, and (3) those selecting both options

Table 2. Frequency with Which Respondents Seek Information on Pollution Prevention and Waste Reduction (*n* = 68)

RESPONSES	%
Rarely	2.9
Sometimes	38.2
Often	42.6
Extremely often	16.2

Table 3. Reasons for Looking for Information on Pollution Prevention or Waste Reduction (*n* = 68)

	Total (*n* = 68)	By frequency of information seeking	
		Frequent (*n* = 40)	Nonfrequent (*n* = 28)
REASON	%	%	%
As part of job duties	64.7	60.0	71.4
For some other reason	4.4	5.0	3.6
As part of job duties and for some other reason	30.9	35.0	25.0

Table 4. Specific Non-job Related Reasons for Looking for Information on Pollution Prevention and Waste Reduction (*n* = 21)

THEMES	# of mentions
Reducing pollution, toxics at home	4
Interest in personal or public health issues	4
Curiosity about or interest in the field, up-to-date information	8
Building projects; lawn, garden, and fruit tree care	3
Care about the environment	7
Other	5

The 24 respondents who indicated they looked for information on pollution prevention and waste reduction topics for non-job related reasons were asked to specify the reason(s). Three of the twenty-four did not respond to this follow-up question. We categorized the responses from the 21 respondents into several commonly occurring themes that were evident. Table 4 summarizes these themes and the number of mentions for each. Each respondent's comments could be classified into a single theme if it mentioned only one or into multiple themes if more than one was touched upon. Therefore, the number of mentions listed for each theme will sum to more than the number of respondents across themes. The detailed responses are provided in Appendix C.

Table 5 summarizes the responses provided when respondents were asked about the pollution prevention and waste reduction topics on which they had looked up information in the past.

Table 5. Types of Information on Pollution Prevention or Waste Reduction Ever Tried to Find (*n* = 68)

	Total (*n* = 68)	By frequency of information seeking	
		Frequent (*n* = 40)	Nonfrequent (*n* = 28)
RESPONSES	%	%	%
Information related to pollution prevention or waste reduction	80.9	92.5	64.3
Case studies/success stories	79.4	85.0	71.4
Toxics reduction	76.5	82.5	67.9
Chemical substitution/alternatives	73.5	82.5	60.7
Environmental news	69.1	77.5	57.1
Regulatory compliance	61.8	72.5	46.4
Upcoming training opportunities in pollution prevention	51.5	67.5	28.6
Upcoming funding opportunities in pollution prevention	41.2	52.5	25.0
Employee engagement/behavior change	38.2	42.5	32.1
Other	7.4	12.5	—

Table 6. Types of Information on Pollution Prevention or Waste Reduction Most Likely To Need in Future (*n* = 68)

| | Total (*n* = 68) | By frequency of information seeking | |
| | | Frequent (*n* = 40) | Nonfrequent (*n* = 28) |
RESPONSES	%	%	%
Information related to pollution prevention or waste reduction	74.6	82.5	63.0
Case studies/success stories	71.6	70.0	74.1
Chemical substitution/alternatives	68.7	72.5	63.0
Toxics reduction	67.2	75.0	55.6
Environmental news	52.2	50.0	55.6
Regulatory compliance	46.3	47.5	44.4
Upcoming training opportunities in pollution prevention	41.8	55.0	22.2
Employee engagement/behavior change	38.8	42.5	33.3
Upcoming funding opportunities in pollution prevention	32.8	40.0	22.2
Other	6.0	10.0	—

Table 6 summarizes the responses provided when respondents were asked about the pollution prevention and waste reduction topics they are most likely to look up in the future.

The topics in Tables 5 and 6 have been listed in order of most-to-least searched for and most-to-least likely to need in future, respectively. There is not much difference between the two lists. Most respondents have looked for Information on pollution prevention or waste reduction issues and on case studies/success stories; most are likely to look up information on these topics in the future. Employee engagement/behavior change and upcoming funding opportunities in pollution prevention are topics for which the least number of respondents have looked up information in the past and on which the least number anticipated needing information in the future.

Sources of Information

To find the information they need, respondents reported relying on various sources, as depicted in Figure 1. General online search engines are the most popular source of information, followed by the EPA Web site. Over half—59%—of respondents use the GLRPPR Web site to source information; more nonfrequent information seekers report using the Web site than do frequent information seekers (see Table 7).

Figure 1. Sources Used to Look for Information on Pollution Prevention and Waste Reduction (*n* = 68)

RESPONSES	By frequency of information seeking	
	Frequent (*n* = 40)	**Nonfrequent (*n* = 28)**
	%	**%**
General online search engines	97.5	85.7
EPA Web site	87.5	67.9
Great Lakes Regional Pollution Prevention Roundtable Web site (www.glrppr.org)	55.0	64.3
Information informally obtained from colleagues or peers	52.5	57.1
Files available within own company/organization	47.5	50.0
National Pollution Prevention Roundtable Web site (www.p2.org)	37.5	46.4
Local library	5.0	10.7
An external vendor for a fee	5.0	—
Other	25.0	10.7

Table 7. Sources Used to Look for Information on Pollution Prevention and Waste Reduction (*n* = 68)

The information sources specified by those who selected the "other" option are as follows, reported separately for frequent and nonfrequent information seekers:

- Frequent seekers:
  - Environmental publications and newsletters, FedCenter, free vendor info, serdp.org, tech blogs, greenbiz, GLRPPR newsletter, Grant monies for air quality through DERA or CMAQ, P2 Info House, PPRC, State Regulatory Programs (1 mention each)
  - Pollution Prevention Resource Exchange - P2Rx (3 mentions)
- Nonfrequent seekers: Industry Associations, local technical assistance/P2 provider – MNTAP, sustainability resources (1 mention each)

The frequency with which each source specified by respondents is used is as follows:

Table 8. Frequency with Which Sources of Information on Pollution Prevention and Waste Reduction Are Used (*n* = 68)

ITEM WORDING	Never	Rarely	Sometimes	Often	Extremely often	Mean
General online search engines (*n* = 63)	—	3.2%	28.6%	34.9%	33.3%	3.98
Information informally obtained from colleagues or peers (*n* = 37)	2.7%	2.7%	43.2%	40.5%	10.8%	3.54
Files available within own company/organization (*n* = 33)	—	9.1%	42.4%	42.4%	6.1%	3.45
EPA Web site (*n* = 54)	—	7.4%	46.3%	40.7%	5.6%	3.44
GLRPPR Web site (www.glrppr.org) (*n* = 40)	—	20.0%	52.5%	27.5%	—	3.08
Local library (*n* = 5)	—	20.0%	60.0%	20.0%	—	3.00
NPPR Web site (www.p2.org) (*n* = 28)	—	35.7%	46.4%	17.9%	—	2.82
An external vendor for a fee (*n* = 2)	50.0%	—	50.0%	—	—	2.00
Other sources (*n* = 13)	—	—	7.7%	69.2%	23.1%	4.15

The differences in mean frequency of use between frequent and nonfrequent information seekers are shown in Figure 2.

**Figure 2. Mean Frequency of Using Sources of Information on Pollution
Prevention and Waste Reduction, by Frequency of Information Seeking**
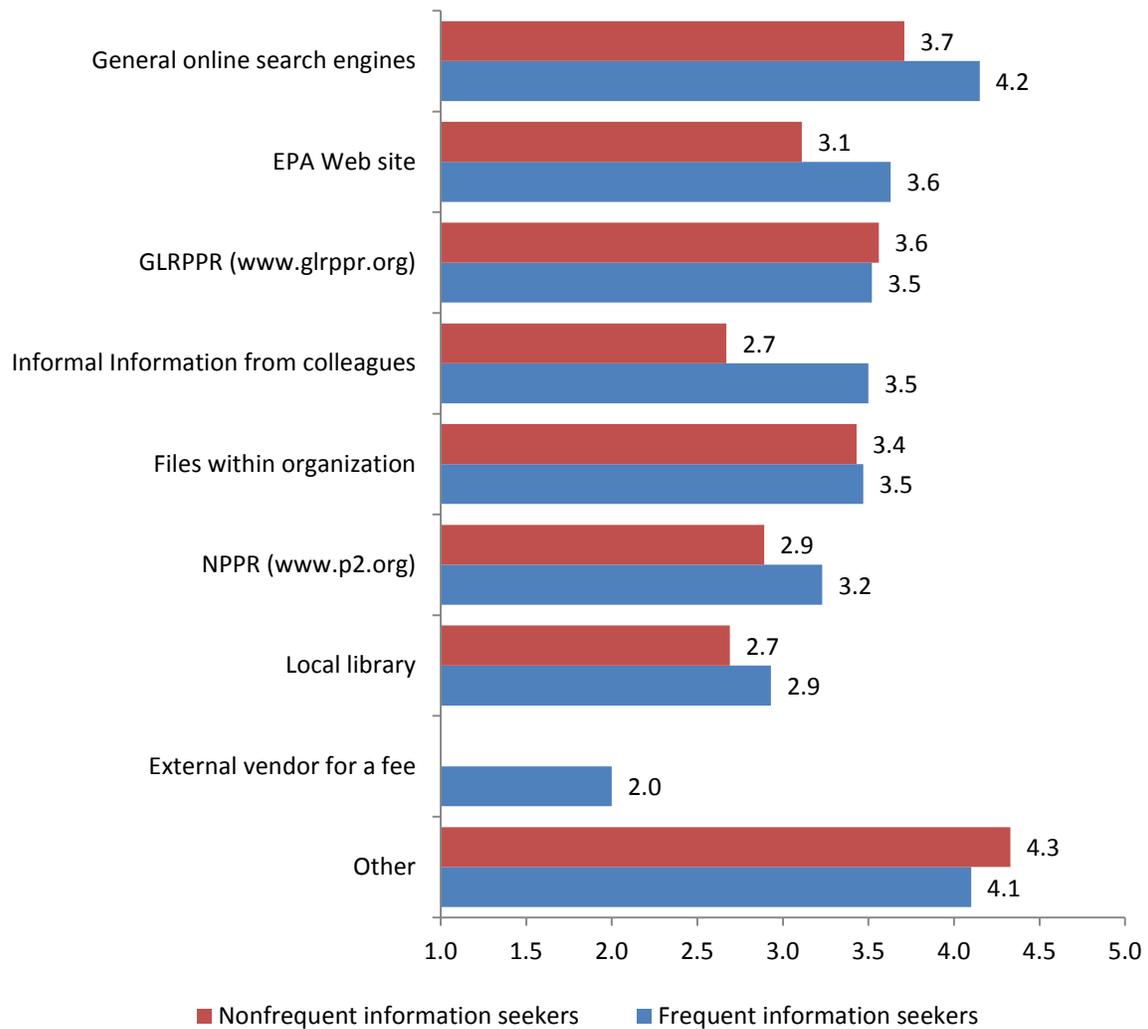
Respondents who said they used GLRPPR as a source for information on pollution prevention and waste reduction topics were asked about the information topics they have accessed from the GLRPPR site in the past. Topic hubs are accessed by the majority of those who use the GLRPPR Web site, while the Help Desk Librarian is used the least.

Table 9. Topics of Information on Pollution Prevention or Waste Reduction Accessed from GLRPPR Web Site

	Total (n = 40)	Frequent (n = 22)	Nonfrequent (n = 18)
		By frequency of information seeking	
RESPONSES	%	%	%
Topic hubs	72.5	77.3	66.7
Sector resources	57.5	63.6	50.0
News	52.5	50.0	55.6
Links to other regional P2Rx centers	52.5	59.1	44.4
GLRPPR Contacts Directory	27.5	27.3	27.8
Event calendar	27.5	22.7	33.3
Link to P2 results database	22.5	13.6	33.3
Funding opportunities	20.0	18.2	22.2
Help Desk Librarian/P2Rx Rapid Response	15.0	18.2	11.1
Other	5.0	9.1	—

Respondents who selected the "other" option specified that they had used the Web site to look for case studies on chemical substitution and to use the search feature.

Respondents also were asked to recall the last time they had tried to find information about pollution prevention or waste reduction and to list the topic(s) for which they had looked for information on this occasion. Fifty-eight respondents answered this question, of which thirty-four were frequent and twenty-four were nonfrequent information seekers. We categorized the responses from the 58 respondents into several commonly occurring themes. Table 10 summarizes these themes and the number of mentions for each. Each respondent's comments could be classified into a single theme if it mentioned only one or into multiple themes if more than one was touched upon. Therefore, the number of mentions listed for each theme will sum to more than the number of respondents across themes. The detailed responses are provided in Appendix C.

Table 10. Topics of Information on Pollution Prevention or Waste Reduction Searched for Most Recently by Respondent

|	Total (n = 58)	Frequent (n = 34)	Nonfrequent (n = 24)
		By frequency of information seeking	
RESPONSES		Number of mentions	
Disposal, recycling, reuse methods	12	8	4
Green chemistry, green purchases	11	10	1
Alternate sources, substitutions	8	4	4
Toxics reduction	7	5	2
Waste reduction	7	4	3
Regulations, policy	5	3	2
Compost, composting	4	2	2
Pertaining to industry	3	1	2
Training, Webinar, conferences	3	2	1
Case studies	2	1	1
Best practices	2	1	1
Recognition programs	2	2	0
Unable to remember	2	0	2
Other	13	11	3

Barriers to Getting Information

Respondents report facing the following issues while trying to find the information they need. Not being able to find information on current topics of interest is the reason selected by the largest percentage of respondents, and incomplete information on a topic is the reason selected by the next largest.

Table 11. Issues Faced While Trying to Get Information

	Total (*n* = 68)	By frequency of information seeking	
		Frequent (*n* = 40)	Nonfrequent (*n* = 28)
RESPONSES	%	%	%
Could not find information on current topics of interest	49.3	56.4	39.3
Incomplete information on a topic	40.3	43.6	35.7
Too much information to sift through	37.3	46.2	25.0
Lack of good quality information	34.3	41.0	25.0
Experienced no issues	25.4	17.9	35.7
No information on whom to contact when you cannot find the information you need	19.4	28.2	7.1
Other	13.4	20.5	3.6

Figure 3. Whether Able to Find Information Needed on Pollution Prevention and Waste Reduction
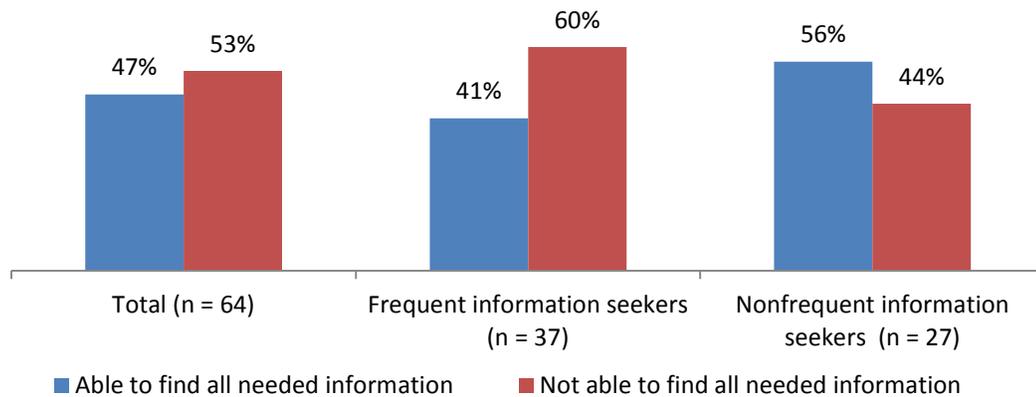
When asked to recall the last time they had tried to find information about pollution prevention or waste reduction, a little over half of all respondents (53.1%, *n* = 64) indicated that they were unable to find all the information they needed; this number was higher for the frequent information-seeking group (see Figure 3).

Those who reported being able to find all the needed information were presented with a follow-up question that asked them to rate the usefulness of the information they found. The mean rating for all respondents is 3.63, which is between "moderately" to "very" useful (see Table 12). The rating of usefulness is higher for nonfrequent information seekers as compared to frequent information seekers.

Table 12. Ratings of Usefulness of the Information Found by Respondents

| | Total (*n* = 30) | By frequency of information seeking | |
		Frequent (*n* = 15)	Nonfrequent (*n* = 15)
RESPONSES	%	%	%
Moderately useful	40.0	46.7	33.3
Very useful	56.7	53.3	60.0
Extremely useful	3.3	—	6.7
Mean rating	3.63	3.53	3.73

Those who reported being unable to find all the needed information were asked a different follow-up question about the topics for which they were not able to find all the needed information. Thirty of the thirty-four respondents provided a response to this open-ended question. Responses have been categorized into themes; the themes and the number of mention for each are listed in Table 13.

Table 13. Topics on Which Respondents Were Not Able to Find All Needed Information

| | Total (*n* = 30) | By frequency of information seeking | |
		Frequent (*n* = 11)	Nonfrequent (*n* = 19)
RESPONSES		Number of mentions	
Specific substance, chemical, item, topic	4	2	2
Regulations, policy	4	2	2
Analytic tools, metrics	3	2	1
Alternate sources, substitutions	2	1	1
Incomplete information	2	1	1
Waste reduction, recycling	2	1	1
Best practices, program-related information	2	2	0
New technologies, methods, up-to-date information	2	2	0
Renewable energy	1	0	1
Examples, case studies	1	0	1
Funding opportunities	1	1	0
Training	1	1	0
None	2	1	1
Other	4	3	1

Finally, all respondents were asked about the issues they had experienced, if any, during their most recent attempt to find information relevant to pollution prevention and waste reduction. The top two issues that respondents selected was incomplete information on topics and lack of high-quality information (see Table 14).

Table 14. Issues Faced While Trying to Get Information During Most Recent Search

| | Total (*n* = 68) | By frequency of information seeking | |
		Frequent (*n* = 40)	Nonfrequent (*n* = 28)
RESPONSES	%	%	%
Incomplete information on a topic	66.7	79.2	33.3
Lack of high-quality information	48.5	45.8	55.6
Too much information to sift through	33.3	29.2	44.4
No information on whom to contact when you cannot find the information you need	30.3	37.5	11.1
Other issues	15.2	12.5	22.2

The other issues faced by respondents were as follows:

- *Blocked by agency web filter*
- *Great info; just not entirely applicable to our situation*
- *Need insight on timing for grants for clean air, retrofit of older diesel engine DPF*
- *Search engine results produced a lot a vendor information*

Training Needs

In the last section of the questionnaire, respondents were asked about their training needs. Respondents rated the utility of training sessions or seminars on issues of pollution prevention or waste reduction to themselves (Table 15). The mean rating was 3.21, which corresponds to a "moderately" useful rating. About a third of respondents rated training as potentially "very" or "extremely" useful to themselves. This varied by frequency of information-seeking behavior; as one would expect, frequent information seekers rated training as more useful than did nonfrequent information seekers.

Respondents who rated the utility of training as something other than "not at all useful" were asked to list up to six topics that would be of use to them if covered during training. The topics spontaneously mentioned by respondents and the number of topics for each is summarized in Table 16. Detailed responses are in Appendix C.

Table 15. Utility of Training to Respondents

ITEM WORDING	Not useful at all	Slightly useful	Moderately useful	Very useful	Extremely useful	Mean
If training sessions or seminars were to be offered on issues of pollution prevention or waste reduction, how useful would these be to you?						
All respondents (*n* = 63)	7.9%	11.1%	42.9%	28.6%	9.5%	3.21
Frequent information seekers (*n* = 37)	5.4%	8.1%	37.8%	32.4%	16.2%	3.46
Nonfrequent information seekers (*n* = 26)	11.5%	15.4%	50.0%	23.1%	—	2.85

Table 16. Topics on Which Training Would Be Useful

		By frequency of information seeking	
	Total (*n* = 68)	Frequent (*n* = 40)	Nonfrequent (*n* = 28)
RESPONSES		Number of mentions	
Waste, waste reduction, recycling, disposal	25	17	8
Alternates, substitutions, alternate assessments	16	9	7
Case studies, best practices, techniques	13	10	3
Measurement tools, data, analytics	11	9	2
New technologies, methods	10	9	1
Toxics, toxic reduction, emission reduction	9	6	3
Green chemistry	8	5	3
Pertaining to industry	8	6	2
Regulations, policies, compliance	7	5	2
Behavior change, engagement	6	4	2
Financing, funding	6	6	0
Energy related	5	4	1
Other green topics	4	2	2
Life cycle	4	4	0
Advanced information	3	2	1
Source reduction	3	3	0
Basic information	1	1	0
Other	30	26	4

And, finally, respondents were asked to rate their likelihood of participating in a training seminar about pollution prevention or waste reduction if it was offered in a variety of formats (see Table 17). The Webinar and online training taken at one's own pace were the most popular options (mean ratings = 3.84 and 3.28, respectively, for all respondents); even so, the mean likelihood ratings for taking part in training offered in these formats are less than 4.0 ("very likely"). Frequent information seekers report greater likelihood of taking part in trainings in all formats as compared to nonfrequent information seekers.

None of the other format options yield a likelihood of taking part that is high or even moderate.

Table 17. Likelihood of Attending Training Sessions if Offered in a Variety of Formats

Item wording	Not at all likely	Slightly likely	Moderately likely	Very likely	Extremely likely	Mean
How likely would you be to participate in a training seminar about pollution prevention or waste reduction if it was offered...						
As a Webinar?						
All respondents (*n* = 58)	1.7	6.9	24.1	39.7	27.6	3.84
Frequent information seekers (*n* = 35)	2.9	2.9	20.0	37.1	37.1	4.03
Nonfrequent information seekers (*n* = 23)	—	13.2	30.4	43.5	13.0	3.57
As an in-person workshop?						
All respondents (*n* = 58)	24.1	41.4	22.4	8.6	3.4	2.26
Frequent information seekers (*n* = 35)	22.9	42.9	20.0	8.6	5.7	2.31
Nonfrequent information seekers (*n* = 23)	26.1	39.1	26.1	8.7	—	2.17
At a conference?						
All respondents (*n* = 58)	13.8	39.7	29.3	13.8	3.4	2.53
Frequent information seekers (*n* = 35)	8.6	42.9	31.4	11.4	5.7	2.63
Nonfrequent information seekers (*n* = 23)	21.7	34.8	26.1	17.4	—	2.39
As an online training course, which includes tests or quizzes and is scheduled at a specific time?						
All respondents (*n* = 57)	14.0	22.8	40.4	19.3	3.5	2.75
Frequent information seekers (*n* = 35)	14.3	17.1	45.7	20	2.9	2.80
Nonfrequent information seekers (*n* = 22)	13.6	31.8	31.8	18.2	4.5	2.68
As an online training course, which includes tests or quizzes, taken at your own pace?						
All respondents (*n* = 57)	7.0	10.5	42.1	28.1	12.3	3.28
Frequent information seekers (*n* = 34)	5.9	11.8	35.3	32.4	14.7	3.38
Nonfrequent information seekers (*n* = 23)	8.7	8.7	52.2	21.7	8.7	3.13

Appendix A

Questionnaire

GLRPPR Information Needs Survey

<u>**Welcome**</u>

As a member of GLRPPR it is very likely that you have used the services and information offered by the organization. We would like to know from members like you how we can do better at serving your information needs. Your input will be helpful as we improve our website design and resources offered.

We are asking for your help in completing this online questionnaire and providing your feedback. While there is no compensation for participating in this study, we value your input and hope that you can devote approximately 15 minutes of your time to answer the questions.

You must be 18 years or older to participate in this research study. Participation is voluntary and you are free to stop answering questions at any time. The decision to participate, decline, or withdraw from participation will have no effect on your status at or future relations with GLRPPR. The information you provide will be completely confidential and will only be reported as aggregated group data. There are no known risks associated with participating in this study beyond those experienced in everyday life. Your participation will likely benefit others by suggesting areas for improvement.

To protect the confidentiality of your responses, the Survey Research Laboratory (SRL) at the University of Illinois is managing the administration of this survey. SRL will not provide GLRPPR with any personal, identifying information.

If you have any questions about this survey, please contact Sowmya Anand at (217) 333 2219 or via email at <u>sanand@illinois.edu</u>. You can also contact me; details are below. If you have any concerns about the study or questions about your rights as a research participant, you can contact the University of Illinois Institutional Review Board (IRB) via phone at (217) 333 2670 (you may call collect) or via email at irb@illinois.edu.

Thank you for considering helping us in this effort!

Laura L. Barnes
Librarian/Executive Director,
Great Lakes Regional Pollution Prevention Roundtable (GLRPPR)
l-barnes@illinois.edu
_____
I have read the consent document above and voluntarily agree to complete the survey. Click the "print" button on the browser if you would like to print this document for your records.
(Please click on "next page" below to provide consent and to get to the survey.)

Some notes on navigating the survey . . .

- **Questions will be presented to you on each screen.**

- **Although we have tried to prevent it, sometimes you will have to scroll down to see all the questions on a page.**

- **After you have answered all the questions on a screen, please click "Next Page" to save your answers and move to the next screen. When you reach the end of the questionnaire, please click "Submit" so that your responses can be saved.**

- **If you would like to return to a previous screen, please click "Previous Page."**

- **If you change any of your previous answers on a screen, please remember to click "Next Page" before proceeding to the next screen.**

- **If you need to exit the survey before completing, simply close your browser. The next time you click the survey link in the e-mail invitation, you will see that your previous responses have been saved. You can change your previous responses and/or continue from where you left off.**

- **The survey link is unique to you; please do not forward it or otherwise share it with anyone else.**

<div align="center">

ID: 2

</div>

How often do you try to find information about pollution prevention or waste reduction?

○ Never
○ Rarely
○ Sometimes
○ Often
○ Extremely often

> **IF:** response to ID 2="Never" **THEN:** Disqualify and display: "This survey pertains to members who access information on pollution prevention and waste reduction topics. Thank you for your time."

<div align="center">

ID: 4

</div>

Have you looked for information on pollution prevention or waste reduction as part of your job duties, for some other reason, or both?

Please select all that apply.

☐ Part of job duties

☐ Some other reason

> **IF:** response to ID 4="some other reason" **THEN:** Display question ID 6

<div align="center">

ID: 6

</div>

Please describe the non-job-related reason(s) why you have looked for information on pollution prevention or waste reduction.

[   ]

ID: 8

Which type of information on pollution prevention or waste reduction have you ever tried to find?

	Ever tried to find
Toxics reduction	☐
Regulatory compliance	☐
Information related to pollution prevention or waste reduction	☐
Chemical substitution/alternatives	☐
Upcoming training opportunities in pollution prevention	☐
Upcoming funding opportunities in pollution prevention	☐
Environmental news	☐
Employee engagement/behavior change	☐
Case studies/success stories	☐
Other	☐

ID: 73

Which type of information on pollution prevention or waste reduction do you anticipate you are <u>most likely to need in the future</u>?

	Most likely to need in the future
Toxics reduction	☐
Regulatory compliance	☐
Information related to pollution prevention or waste reduction	☐
Chemical substitution/alternatives	☐
Upcoming training opportunities in pollution prevention	☐
Upcoming funding opportunities in pollution prevention	☐
Environmental news	☐
Employee engagement/behavior change	☐
Case studies/success stories	☐
Other	☐

ID: 48

When you need information about pollution prevention or waste reduction, what sources do you use to look for the information?

☐ General online search engines

☐ Your local library

☐ Great Lakes Regional Pollution Prevention Roundtable website (GLRPPR; www.glrppr.org/)

☐ National Pollution Prevention Roundtable website (NPPR; www.p2.org)

☐ EPA Website

☐ Files available within your company/organization

☐ An external vendor for a fee

☐ Information informally obtained from colleagues or peers

☐ Other (please specify):_____

<div align="center">

ID: 84

</div>

How often do you use [piped from ID 48] to look for information about pollution prevention or waste reduction issues?

○ Never
○ Rarely
○ Sometimes
○ Often
○ Extremely often

<div align="center">

ID: 50

</div>

While searching for information about pollution prevention or waste reduction, did you experience any of the following issues while trying to get the information you need?

If you have not experienced any issues, please select "Experienced no issues."

☐ Did not experience any issues

☐ Too much information to sift through

☐ No information on whom to contact when you cannot find the information you need

☐ Lack of good quality information

☐ Incomplete information on a topic

☐ Other issues (please specify): _____

Page entry logic: IF: response to ID 48 ="Great Lakes Regional Pollution Prevention Roundtable website (GLRPPR; www.glrppr.org/" **THEN** display ID 30

<div align="center">

ID: 30

</div>

You indicated earlier that you have used the GLRPPR website to look for information on pollution prevention or waste reduction. Which of the following information have you accessed from the GLRPPR website?

☐ Topic hubs

☐ News

☐ GLRPPR Contacts Directory

☐ Help Desk Librarian/P2Rx Rapid Response

☐ Event calendar

☐ Funding opportunities

☐ Sector resources

☐ Links to other regional P2Rx centers

☐ Link to P2 results database

☐ Other (specify): _____

<div align="center">

ID: 51

</div>

In answering the next set of questions, please think back to the last time you used one or more resources to look for information on pollution prevention or waste reduction.

<div align="center">**ID: 23**</div>

On what topic or topics pertaining to pollution prevention or waste reduction were you looking for information?

<div align="center">**ID: 24**</div>

Thinking back to the <u>last time</u> you used one or more resources to look for information on pollution prevention or waste reduction...

Were you able to find all the information you needed, or were you not able to find all the information you needed?

○ Able to find all the information
○ Not able to find all the information

IF: response to ID 24 ="Able to find all the information" **THEN:** Display ID 52

<div align="center">**ID: 52**</div>

How useful was the information that you found?

○ Not useful at all
○ Slightly useful
○ Moderately useful
○ Very useful
○ Extremely useful

IF: response to ID 24 ="Not able to find all the information" **THEN:** Display ID 53

<div align="center">**ID: 53**</div>

On what topic or topics pertaining to pollution prevention or waste reduction were you unable to get information?

<div align="center">**ID: 28**</div>

Thinking back to the <u>last time</u> you used one or more resources to look for information on pollution prevention or waste reduction...

Which of the following issues, if any, did you experience while trying to get the information you needed?

If you did not experience any issues, please select "Did not experience any issues."

☐ Did not experience any issues

☐ Too much information to sift through

☐ No information on whom to contact when you cannot find the information you need

☐ Lack of good quality information

☐ Incomplete information on a topic

☐ Other issues (please specify): _____

<div align="center">

ID: 54

</div>

If training sessions or seminars were to be offered on issues of pollution prevention or waste reduction, how useful would these be to you?

○ Not useful at all
○ Slightly useful
○ Moderately useful
○ Very useful
○ Extremely useful

IF: response to ID 54 =""Slightly useful", or "Moderately useful", or "Very useful", or "Extremely useful"" **THEN:** Display ID 55

<div align="center">

ID: 55

</div>

What pollution prevention or waste reduction topics would be useful to address in training sessions or seminars?

Topic 1:	
Topic 2:	
Topic 3:	
Topic 4:	
Topic 5:	
Topic 6:	

IF: response to ID 54 =""Slightly useful", or "Moderately useful", or "Very useful", or "Extremely useful"" **THEN:** Display ID 87, 85, 86, 89, 90, and 91

Below is a list of formats in which training might be offered. For each format, please indicate how likely you would be to participate in a training seminar about pollution prevention or waste reduction if it was offered in that format.

How likely would you be to participate in a training seminar about pollution prevention or waste reduction if it was offered...

<div align="center">

ID: 85

</div>

As a <u>webinar</u>

○ Not at all likely   ○ Slightly likely   ○ Moderately likely   ○ Very likely   ○ Extremely likely

<div align="center">

ID: 86

</div>

As an <u>in-person workshop</u>

○ Not at all likely   ○ Slightly likely   ○ Moderately likely   ○ Very likely   ○ Extremely likely

<div align="center">

ID: 89

</div>

At a conference

○ Not at all likely   ○ Slightly likely   ○ Moderately likely   ○ Very likely   ○ Extremely likely

<center>**ID: 90**</center>

As an online training course, which includes tests or quizzes and is <u>scheduled at a specific time</u>

○ Not at all likely   ○ Slightly likely   ○Moderately likely   ○ Very likely   ○ Extremely likely

<center>**ID: 91**</center>

As an online training course, which includes tests or quizzes, <u>taken at your own pace</u>

○ Not at all likely   ○ Slightly likely   ○Moderately likely   ○ Very likely   ○ Extremely likely

---

About you

Next, we have some questions about you.

<center>**ID: 57**</center>

Which of the following best describes your current employment status?

○ Working full time
○ Working part time
○ Unemployed, looking for work
○ Retired
○ In school

IF: response to ID 57 ="Working full time", or "Working part time" **THEN:** Display ID 59, 60, 61

<center>**ID: 59**</center>

How many years have you been working on issues related to pollution prevention or waste reduction?

<center>**ID: 60**</center>

If you have been working on these issues for less than one year, please select the "Less than one year" option.

○ Less than one year

<center>**ID: 61**</center>

Otherwise, please specify the number of years in the text box provided.

IF: response to ID 57="""Unemployed, looking for work", or "Retired", or "In school""" **THEN:** Display ID 68, 69, 70

<center>**ID: 68**</center>

How long have you been interested in issues related to pollution prevention or waste reduction?

<center>**ID: 69**</center>

If you have been interested in these issues for less than one year, please select the "Less than one year" option.

○ Less than one year

ID: 70

Otherwise, please specify the number of years in the text box provided.

ID: 92

In which country do you reside?

○ Canada
○ United States of American
○ Other

IF: response to ID 57=""Unemployed, looking for work", or "Retired", or "In school"" AND response to ID 92 = "United States of America" **THEN:** Display ID 62

ID: 62

In which state do you reside?

○ Alabama
○ Alaska
○ American Samoa
○ Arizona
○ Arkansas
○ California
○ Colorado
○ Connecticut
○ Delaware
○ District of Columbia
○ Federated States of Micronesia
○ Florida
○ Georgia
○ Guam
○ Hawaii
○ Idaho
○ Illinois
○ Indiana
○ Iowa
○ Kansas
○ Kentucky
○ Louisiana
○ Maine
○ Marshall Islands
○ Maryland
○ Massachusetts
○ Michigan
○ Minnesota

○ Mississippi

○ Missouri

○ Montana

○ Nebraska

○ Nevada

○ New Hampshire

○ New Jersey

○ New Mexico

○ New York

○ North Carolina

○ North Dakota

○ Northern Mariana Islands

○ Ohio

○ Oklahoma

○ Oregon

○ Palau

○ Pennsylvania

○ Puerto Rico

○ Rhode Island

○ South Carolina

○ South Dakota

○ Tennessee

○ Texas

○ Utah

○ Vermont

○ Virgin Islands

○ Virginia

○ Washington

○ West Virginia

○ Wisconsin

○ Wyoming

IF: response to ID 57="Working full time", or "Working part time" AND response to ID 92 = "United States of America"
THEN: Display ID 63

ID: 63

In which state is your primary work location?

○ Alabama

○ Alaska

○ American Samoa

○ Arizona

○ Arkansas

○ California

○ Colorado

○ Connecticut
○ Delaware
○ District of Columbia
○ Federated States of Micronesia
○ Florida
○ Georgia
○ Guam
○ Hawaii
○ Idaho
○ Illinois
○ Indiana
○ Iowa
○ Kansas
○ Kentucky
○ Louisiana
○ Maine
○ Marshall Islands
○ Maryland
○ Massachusetts
○ Michigan
○ Minnesota
○ Mississippi
○ Missouri
○ Montana
○ Nebraska
○ Nevada
○ New Hampshire
○ New Jersey
○ New Mexico
○ New York
○ North Carolina
○ North Dakota
○ Northern Mariana Islands
○ Ohio
○ Oklahoma
○ Oregon
○ Palau
○ Pennsylvania
○ Puerto Rico
○ Rhode Island
○ South Carolina
○ South Dakota
○ Tennessee
○ Texas

○ Utah
○ Vermont
○ Virgin Islands
○ Virginia
○ Washington
○ West Virginia
○ Wisconsin
○ Wyoming

IF: response to ID 57="Working full time", or "Working part time" **THEN:** Display ID 64

ID: 64

Which of the following best describes the type of organization for which you work?

○ Private company
○ Nonprofit organization
○ Federal Government or government agency
○ Regional Government or government agency
○ Local Government or government agency
○ State Government or government agency
○ K–12 education
○ Community college
○ Technical school
○ Four year college or university
○ Other (specify): _____

IF: response to ID 57="Working full time", or "Working part time" **THEN:** Display ID 65

ID: 65

About how many people work in your organization at all locations?

Count part-time and full-time employees.

ID: 71

Thank you for taking our survey. Your response is very important to us.

Appendix B

Text of E-mail Invitation

E-vite and Reminder Text

Dear [contact("first name")],

The Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) is sponsoring an online survey to get feedback from members like you about how we can do better at serving your information needs. Your feedback will help GLRPPR make decisions about its services and help improve them.

To protect the confidentiality of your responses, the Survey Research Laboratory (SRL) at the University of Illinois is managing the administration of this survey. SRL will not provide GLRPPR with any personal, identifying information about anyone who completes the survey. In addition, the results of the survey will be reported at the aggregate level, and individual responses will not be reported.

Please do not forward this email invitation to anyone else, as the link is unique to you. If you have any questions about this survey, please contact Sowmya Anand at (217) 333 2219 or via email at sanand@illinois.edu. If you have any concerns about the study or questions about your rights as a research participant, you can contact the University of Illinois Institutional Review Board (IRB) via phone at (217) 333 2670 (you may call collect) or via email at irb@illinois.edu.

Please click the following link to access the survey: [invite("survey link")]

Thank you for your participation.

Laura L. Barnes
Librarian/Executive Director, Great Lakes Regional Pollution Prevention Roundtable (GLRPPR)
l-barnes@illinois.edu

Reminder #1 sent via GLRPPR Listserv

Subject: Please help GLRPPR improve by giving your feedback

Dear GLRPPR member,

GLRPPR is looking for feedback on the information services it provides to it members. And, we are hoping to collect this feedback by means on an online survey. Last week you would have received an email invitation to take part in this online survey with the subject: "GLRPPR requests your feedback." If you have already completed the survey; thank you very much. If you have not yet had a chance to do so, please consider taking 10 minutes to complete this survey. Your feedback will be extremely helpful as GLRPPR makes changes and improvements to its services.

If you have not received the email with the link to the online survey, please contact Sowmya Anand at sanand@uiuc.edu and she will send you one.

Laura L. Barnes

Librarian/Executive Director,

Great Lakes Regional Pollution Prevention Roundtable (GLRPPR)

l-barnes@illinois.edu

Reminder #2 sent via GLRPPR Listserv

Subject: Last chance to help GLRPPR by giving your feedback

Dear GLRPPR member,

GLRPPR is looking for feedback on the information services it provides to it members. We are collecting this feedback through an online survey, which will remain open only for another week. Your feedback will be extremely helpful as GLRPPR makes changes and improvements to its services.

You might have received one or more email invitations to take part in this survey. If you have already completed the survey; thank you very much. If you have not yet had a chance to do so, please consider taking 10 minutes to complete this survey.

If you previously attempted to access the online survey and ran into problems, please accept our apologies for the technical errors. The website on which the survey is hosted was under a "Denial of Service" attack, but has since taken steps to rectify the situation.

If you have not received the email with the link to the online survey, please contact Sowmya Anand at sanand@uiuc.edu and she will send you one.

Laura L. Barnes

Librarian/Executive Director,

Great Lakes Regional Pollution Prevention Roundtable (GLRPPR)

l-barnes@illinois.edu

Appendix C

Full Text of Open-Ended Responses

Please describe the non-job-related reason(s) why you have looked for information on pollution prevention or waste reduction.

Reducing pollution, toxics at home

- Building projects, lawn, garden & fruit tree care, household toxics removal
- Figure out how to reduce pollution from home as well as figuring out how to become more LEAN
- Home maintenance, lawn care.
- Health and Family issues

Interest in personal or public health issues

- Curiosity on what's happening in the field and how P2 relates to health.
- Interest in public health as it is related to pollution
- Personally for healthier ways to do things. Natural cleaning supplies, places to recycle anything, reuse options and ideas to reduce what I currently do.
- Health and Family issues

Curiosity about or interest in the field, up-to-date information

- Curiosity on what's happening in the field and how P2 relates to health.
- Energy efficiency and waste reduction opportunities for communities, curiosity
- I am a Instructor in the field of hazardous waste remediation and use this service to stay current in the industry.
- Personal interest in subject
- personal interest—environmental interest.
- good source of information
- I am retired from a P2 job, and I am still interested in the subject.
- Personal knowledge

Building projects; lawn, garden, and fruit tree care

- Building projects, lawn, garden, & fruit tree care, household toxics removal
- Home maintenance, lawn care
- I helped my mom set up a compost to reduce food waste so we researched that. We also researched ways to help her lawn without using traditional fertilizers that just run into Madison's lakes

Care about the environment

- I recycle items for friends and relatives. Items like electronics. Lights from conversions to LED from ballasted fluorescence.

- Looking for anything the we can add that will lower waste which can lower costs or make our service better
- personal information, help family or friends
- personal interest—environmental interest
- Personally for healthier ways to do things. Natural cleaning supplies, places to recycle anything, reuse options and ideas to reduce what I currently do.
- Because I live on this planet and every human should work towards reducing waste and preventing pollution. (Yes, that sounds ludicrously Pollyanna-ish, but so be it.)
- I helped my mom set up a compost to reduce food waste so we researched that. We also researched ways to help her lawn without using traditional fertilizers that just run into Madison's lakes

Other

Frequent user comments

- At home
- Energy efficiency and waste reduction opportunities for communities, curiosity
- Figure out how to reduce pollution from home as well as figuring out how to become more LEAN
- Interest in public health as it is related to pollution
- volunteer activities

On what topic or topics pertaining to pollution prevention or waste reduction were you looking for information?

Disposal, recycling, reuse methods

Frequent user comments

- Beneficial use of alum sludge
- Composite recycling Disposal of carbon fines
- Diesel exhaust emission reduction/aftertreatment for industrial vehicles, generators, off road/on road, etc.
- Fluorescent bulb recycling for school program.
- green chemistry, metal finishing P2, energy efficiency, water efficiency, and finding reuses for plastic substrates
- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs
- P2 for printers, auto repair and body shops, educational facilities
- Where to recycle certain items.

Nonfrequent user comments

- Options for expired military grade de-icing fluid.
- PCB disposal methods.
- Printers
- Recycling of various items.

Green chemistry, green purchases

Frequent user comments

- Environmental regulatory updates, Green topics, new equipment or procedures.
- green building alternatives/green chemistry
- green chemistry
- Green Chemistry, how to help businesses start up a waste reduction program, source reduction
- green chemistry, metal finishing P2, energy efficiency, water efficiency, and finding reuses for plastic substates
- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs
- health care hazardous waste regulatory compliance, composting, green chemistry, trends in P2 assistance
- P2 for coating aluminum, surface preparation; nanocrystalline cobalt alloy as hard chrome alternative; Recognizing employee efforts for better P2; Green chemistry
- environmentally preferable purchasing
- green cleaning products

Nonfrequent user comments

- green chemistry

Alternate sources, substitutions

Frequent user comments

- alternatives assessments
- Green Chemistry, how to help businesses start up a waste reduction program, source reduction
- P2 for coating aluminum, surface preparation; nanocrystalline cobalt alloy as hard chrome alternative; Recognizing employee efforts for better P2; Green chemistry
- safer chemical alternatives case studies for specific chemicals

Nonfrequent user comments

- renewable energy issues (if that counts) small business (manufacturing) waste reduction ideas other
- solvent substitution
- Solvent substitutions
- Usually toxics reduction—especially related to substitution of alternative chemicals.

Toxics reduction

Frequent user comments

- Diesel exhaust emission reduction/aftertreatment for industrial vehicles, generators, off road/on road, etc.
- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs
- Organics reduction & management
- Toxics reduction resources
- toxics use reduction

Nonfrequent user comments

- POPs and elimination from waste water releases
- Usually toxics reduction—especially related to substitution of alternative chemicals.

Waste reduction

Frequent user comments

- Dry cleaning, general cleaning, waste reduction and energy use
- Green Chemistry, how to help businesses start up a waste reduction program, source reduction
- green chemistry, metal finishing P2, energy efficiency, water efficiency, and finding reuses for plastic substrates
- zero waste to landfill

Nonfrequent user comments

- renewable energy issues (if that counts) small business (manufacturing) waste reduction ideas other
- Waste reduction for laboratories
- zero waste

Regulations, policy

Frequent user comments

- Environmental regulatory updates, Green topics, new equipment or procedures.
- health care hazardous waste regulatory compliance, composting, green chemistry, trends in P2 assistance
- I was looking for analysis of policy—specifically the effectiveness of various p2 and waste reduction laws or policy approaches. There is almost NOTHING out there that I could find. This would a huge contribution if GLPPR could help.

Nonfrequent user comments

- chemical regulation TSCA issues
- regulatory compliance.

Compost, composting

Frequent user comments

- Composting efforts
- health care hazardous waste regulatory compliance, composting, green chemistry, trends in P2 assistance

Nonfrequent user comments

- Compost
- Composting, waste-to-energy

Pertaining to industry

Frequent user comments

- Green Chemistry, how to help businesses start up a waste reduction program, source reduction

Nonfrequent user comments

- pollution prevention in manufacturing or industry. pollution prevention conference. case studies
- renewable energy issues (if that counts) small business (manufacturing) waste reduction ideas other

Training, Webinars, conferences
Frequent user comments

- P2 training
- Webinar

Nonfrequent user comments

- pollution prevention in manufacturing or industry. pollution prevention conference. case studies

Case studies
Frequent user comments

- Case studies; use of metrics

Nonfrequent user comments

- pollution prevention in manufacturing or industry. pollution prevention conference. case studies

Best practices
Frequent user comments

- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs

Nonfrequent user comments

- sectors best practices

Recognition programs
Frequent user comments

- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs
- P2 for coating aluminum, surface preparation; nanocrystalline cobalt alloy as hard chrome alternative; Recognizing employee efforts for better P2; Green chemistry

Unable to remember
Nonfrequent user comments

- Can't remember since it was quite a while ago.
- I don't recall any specific examples.

Other
Frequent user comments

- Boiler MACT
- Dry cleaning, general cleaning, waste reduction and energy use
- e-waste data tracking for recycling brownfields
- Environmental regulatory updates, Green topics, new equipment or procedures.
- Green chemistry, toxics reduction, recycling, BPS, recognition programs, partner programs
- health care hazardous waste regulatory compliance, composting, green chemistry, trends in P2 assistance
- P2 training
- PAHs
- storm water management
- Sustainability planning
- Waste to energy

Nonfrequent user comments

- gasification
- plating
- Technical assistance program in Texas.

On what topic or topics pertaining to pollution prevention or waste reduction were you unable to get information?

Specific substance, chemical, item, topic

Frequent user comments

- disinfectants that would meet a green cleaning spec
- health care hazardous waste nuances

Nonfrequent user comments

- drilling down to a particular chemical—would end up going to several different spots—sometimes EPA's site
- Printers

Regulations, policy

Frequent user comments

- Boiler MACT
- Policy analysis and effectiveness of certain legal or policy approaches (for example: how effective are laws that mandate commercial recycling?)

Nonfrequent user comments

- Legislation or regulatory guidance to eliminate the release and creation of POPs especially the Dirty Dozen
- TSCA reform, state status

Analytic tools, metrics

Frequent user comments

- Financial analysis methodology
- Metrics (how to quantify cost and quantity related to P2 efforts)

Nonfrequent user comments

- green chemistry analytical tools

Alternate sources, substitutions

Frequent user comments

- chemical substations

Nonfrequent user comments

- Good nonhazardous solvent substitutions

Incomplete information

Frequent user comments

- Quality and specifics were not as expected. Most articles and information either attempt to sell something or are fluff pieces. Very little in depth material is found.

Nonfrequent user comments

- I am always able to get information but it is not always complete. renewable energy

Waste reduction, recycling

Frequent user comments

- Where to recycle certain items.

Nonfrequent user comments

- waste reduction

Best practices, program related information

Frequent user comments

- Best P2 practices, cost efficient P2 practices
- environmental impact of EPP, exactly how much GHG and other pollutants we can expect to eliminate through EPP

New technologies, methods, up-to-date information

Frequent user comments

- Many times looking to provide cutting-edge technology information, and that information is harder to find than tried and true practices. When working w/cos. that are doing P2 they may already have pursued the low-hanging fruit and are looking to move to the next step/improvement
- up to date P2 information for printers

Renewable energy

Nonfrequent user comments

- I am always able to get information but it is not always complete. renewable energy

Examples, case studies

Nonfrequent user comments

- Was looking for existing examples were a particular process had been used in practical application.

Funding opportunities

Frequent user comments

- Grant monies...federal, state, city, EPA, DNR, clean cities

Training

Frequent user comments

- State programs and training

None

Frequent user comments

- can't remember

Nonfrequent user comments

- n/a

Other

Frequent user comments

- Registration—This was remedied quickly though.
- State programs and training
- You can never have enough information.

Nonfrequent user comments

- To clarify, there are restrictions on the gov't side that prevents certain waste reduction options to be entertained.