Launching the EarthWays Sustainability Network: A Case Study in Waste Reduction in Schools

EarthWays Center of Missouri Botanical Garden

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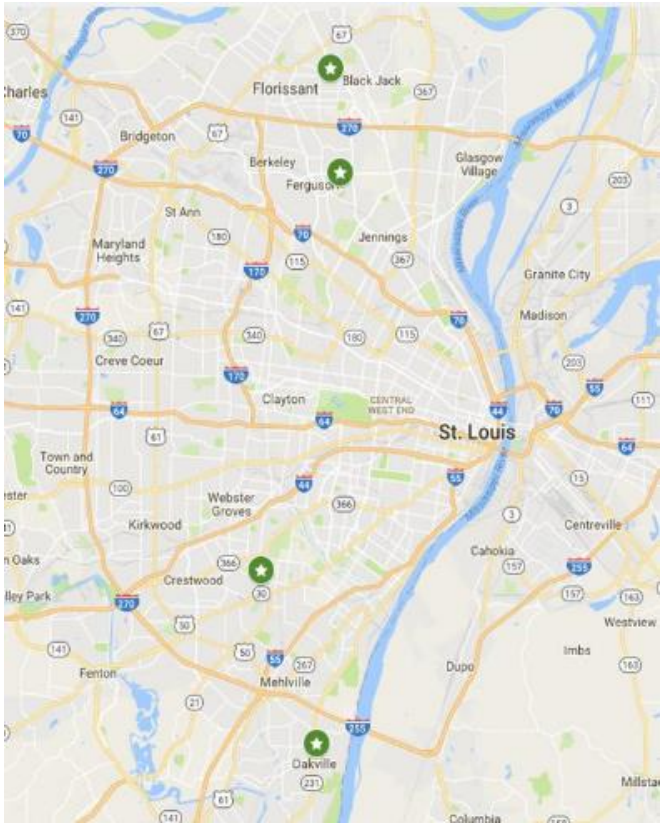
Summary

It is our belief that schools, including teachers and students have the greatest capacity to make a difference in our community. The EarthWays Sustainability Network, or ESN, program serves to better prepare teachers to be the leader in empowering students to take action and solve real-world problems. By connecting with professional educators in the community, EarthWays Center hopes to establish a network of educated, confident, and empowered educators that serve as champions for sustainability at their school. This program serves to develop the necessary tools, knowledge and resources for both students and teachers to better achieve waste reduction goals. As young learners, students form the knowledge-base and values that are carried into their adult lives. These values and judgments impact students' relationship to the environment and their community, and many of these values are formed by the school environment. Training professional educators to better be prepared to address waste reduction goals is a key tool in creating a community of sustainability, waste reduction, and recycling for years to come.

EarthWays Sustainability Network launched during the 2016-17 academic year with funding from a St. Louis County Department of Public Health grant. This grant was supported by utilizing County landfill surcharge funds sought to increase awareness about waste in the St. Louis County community. The pilot year of the program included work with a cohort of four teachers from St. Louis County schools. The participating pilot schools include: Griffith Elementary, Gotsch Intermediate, Halls Ferry Elementary, and St. Francis Assisi Catholic School. Through the year, educators from these schools were supported by EarthWays Center staff as they benchmarked waste data, initiated a Green Team, and implemented projects that directly impacted the amount of waste generated by the school. While each school implemented different projects, the teachers used the ESN program to overcome difficulties together, share success stories, and discuss challenges they faced in their individual schools. Many small projects and changes came from the Green Team's and their projects – from student zero-waste ambassadors, spontaneous waste audits, plastic bag recycling collections to field trips to a local landfill, students teaching students, and changes to service ware in the cafeteria these four schools covered it all. EarthWays Center staff involved in the project included former staff member Jim Biggs, current Sustainability Education Manager Katherine Golden, and Education Coordinator Simon Warren. Katherine served as the main lead for the project and worked closely with each of the teacher to ensure successes. Katherine has an extensive history working with schools on waste reduction projects.

About the Schools



For the pilot project of the ESN project, we recruited four schools from the greater St. Louis County area. The primary focus for recruitment was schools located within areas of St. Louis County where curbside recycling rates were average or below average (approximately less than 40lbs/per household/month) based on hauler tonnage data for the areas. Three public schools and one private school were recruited for the project. The participating pilot schools included two schools from the Ferguson-Florissant School District, one school from the Affton School District, and one private school. The participating schools in the pilot year of ESN were: Griffith Elementary, Gotsch Intermediate, Halls Ferry Elementary, and St. Francis of Assisi School. From each school one teacher was chosen to participate in the full ESN program.

Griffith Elementary School, led by 5th grade teacher Shelly Godfrey, is a public school part of the Ferguson-Florissant School District. The school serves 377 students in grades K-6th grade and has 100% minority enrollment. A second Ferguson-Florissant school participated in the program, Halls Ferry Elementary, and was led by 4th grade teacher Julie Vollmar. Halls Ferry serves 329 students in grades K-6 with 89% of the student body being minority students. Gotsch Intermediate, led by 3rd grade teacher Nicki Hejlek and located in Affton, MO serves 529 students in grades 3-5. Gotsch has a 22% minority enrollment. St. Francis of Assisi is an independent Catholic school located in the Oakville community of St. Louis County. St. Francis of Assisi School's participation was led by the middle school science and computer teacher Mike Herris and the principal Greg Stallman. The school serves students in grades pk-8 with a total of 404 students.

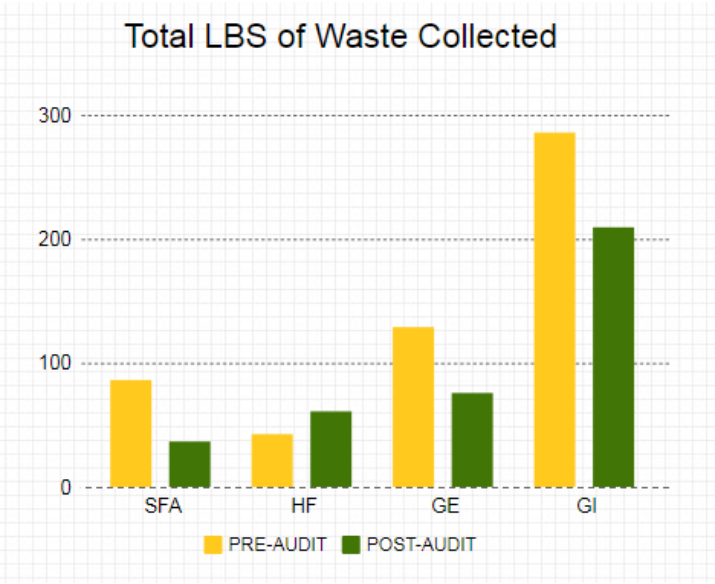
Goals for the four ESN schools included: the desire to significantly decrease the waste generated by increasing recycling in the building and at home, improving recycling behaviors and building knowledge, targeting the spork and other packages issues that were used in cafeterias, learning about composting and waste in school cafeterias, and building better awareness of sustainability and understanding of how actions affect a larger community.

How Did ESN Help Our Teachers and Students?

During the 2016-17 pilot program, teachers from the participating schools demonstrated increased knowledge in recycling processes and practices, a better understanding of the connections between recycling and the environment, and a deeper level of engagement with school initiatives and efforts to reduce waste and increase recycling. On average, teachers were able to correctly identify recyclable materials 80% of the time, with paper towels and scrap metal being the number one contaminates still found in recycling bins. Teachers identified time as the number one barrier to project implementation, with lack of knowledge and resources as two other obstacles to overcome.

Students participating in the program learned about recycling through the two waste audits conducted and through various lessons prepared by their classroom teachers. These students increased their confidence in recycling correctly and identified the need to pay attention and learn more about recycling. Students overwhelming reported that they feel good when they recycle and that there is an inherent interest in wanting to learn ways to reduce what gets thrown away every day. Students were surprised to find recyclables in the trash and items that were in perfectly good condition tossed into bins. Student surveys showed that student interest and participation in recycling habits increased by 20%. An average of 9 out of 10 students believed that it is important to recycle and make less trash, with common responses being “to help the animals” or “to help the environment”. Overall students were able to correctly identify that paper was a recyclable material. After the program, students were able to correctly identify plastic bottles and aluminum cans as recyclable. For students, the most common item incorrectly identified as recycling was chip bags a very common item found in school cafeterias.

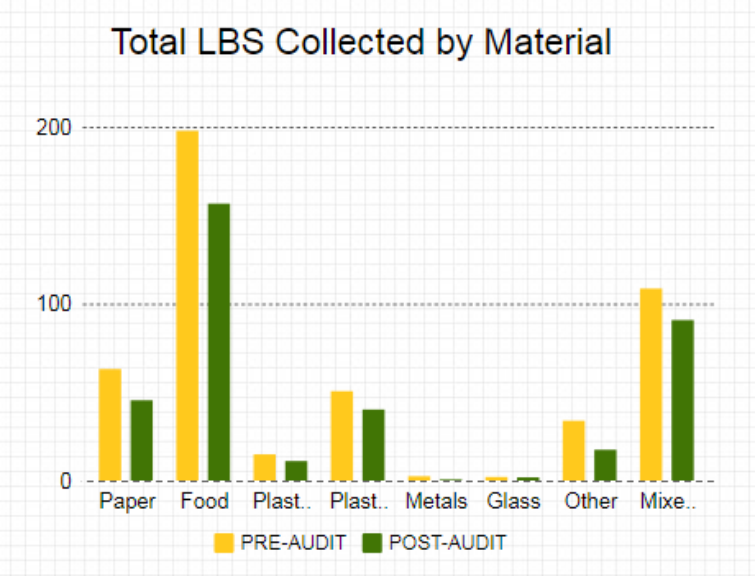
ESN Schools Reduce Waste



Each ESN school performed a pre and post waste audit to measure the success of the waste reduction projects. Pre-waste audits were conducted in September 2016. For each audit, ESN teachers worked with custodial staff at their school to collect the trash from one day’s worth of trash generated at the school. Recycling, if collected, was checked for contamination and weighed. Waste was sorted into six categories (paper, plastic containers/ recyclable plastic, film plastic, metals, glass, and wet waste including paper towels and food waste) and weighed.

During the year, three of the four schools showed a measured decrease in the pounds of waste collected during the day. Total, these four schools reduced the amount of waste generated at their schools by 65%! Halls Ferry Elementary (HF), while having generated more waste during the post-waste audit, also

demonstrated a significant increase in collecting recyclables with 94% of the post-waste audit materials being food waste.

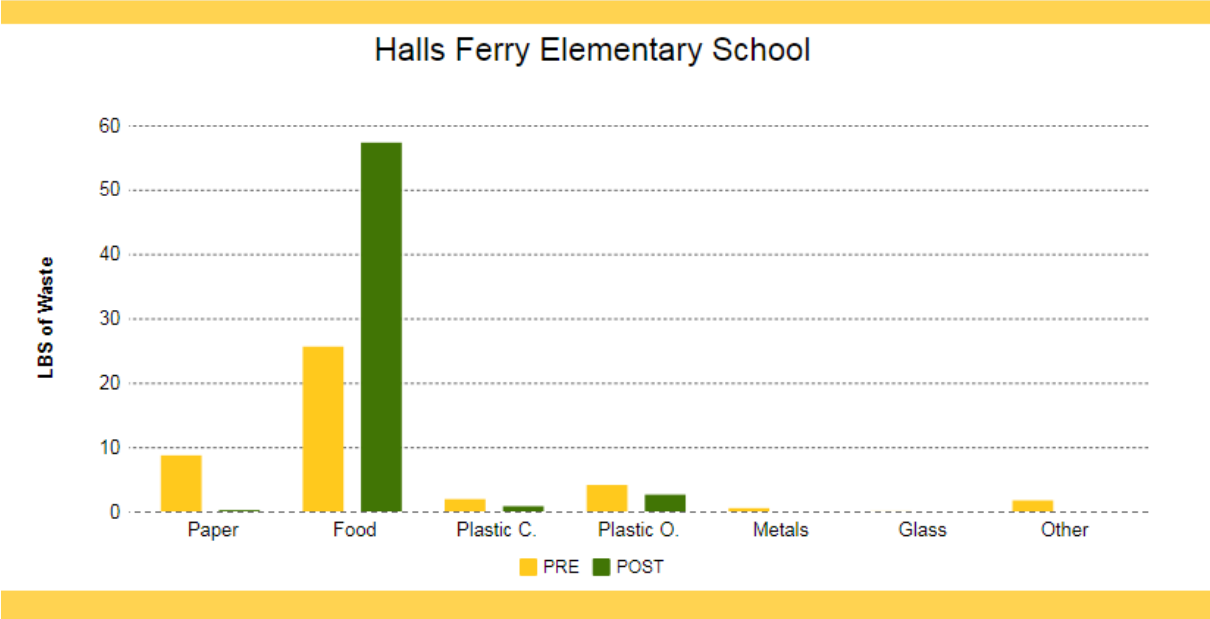


Other tracking measures included monitoring the increase in recycling, collection of specific material types, and student observations during lunch periods regarding waste collected. Schools were more aware of what cafeteria meals generated more lunch, what portions created more waste, and other behaviors related to waste production. Several of the schools reported a switch in the number of times the recycling containers filled over the trash containers. One school, Halls Ferry, worked directly with Ms. Pam their custodial staff, to track this as a measure of tracking their progress. Halls Ferry reported that just three weeks after the student presentations in January the recycling container was full and the waste container was only 1/3 of the way full at the end of the week, a reversal of the types of waste collected prior to the ESN.

Overall, the number one material in the school waste stream was food waste and other organic materials that could be composted. This waste category accounted for nearly 57.5% of all waste generated. Commercial composting was not a feasible resource for the schools to pursue this year, so many chose to work on portion reduction, implementing share tables, and starting small-scale compost projects in their classrooms. As a tangible material to target, schools worked on increasing the paper and plastic collected for recycling. St. Francis of Assisi School targeted film plastic, their number problem material, by getting involved with the TREX challenge. Metals such as aluminum, steel and tin, as well as glass were not a typical material found in these four schools waste streams, with the only items being generated from teacher lounges or offices. Overall, all materials that were measured and weighed saw a decrease in the number of pounds collected at these four schools.

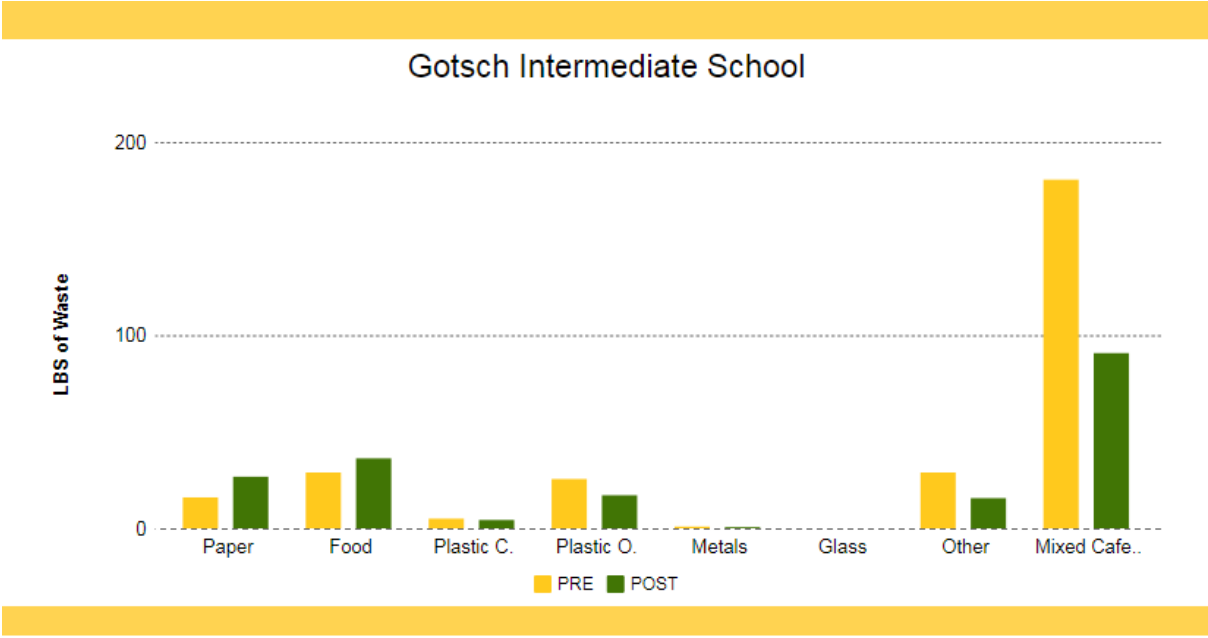
During the waste audits, student comments were collected. Students, while maybe initially hesitant, overall enjoyed the waste audit experience. Students were shocked by the amount of trash their school was generating. Many students made comments about the amount of recyclable materials, specifically paper that should have been included in recycling. Food waste and materials that were still perfectly good such as toys and books also stood out as a surprise find for students. Students offered suggestions such as starting clubs, giving presentations, making posters, and labeling bins as a result of the waste audits. A summary of student responses is included at the end of this report.

School Waste Audit Results



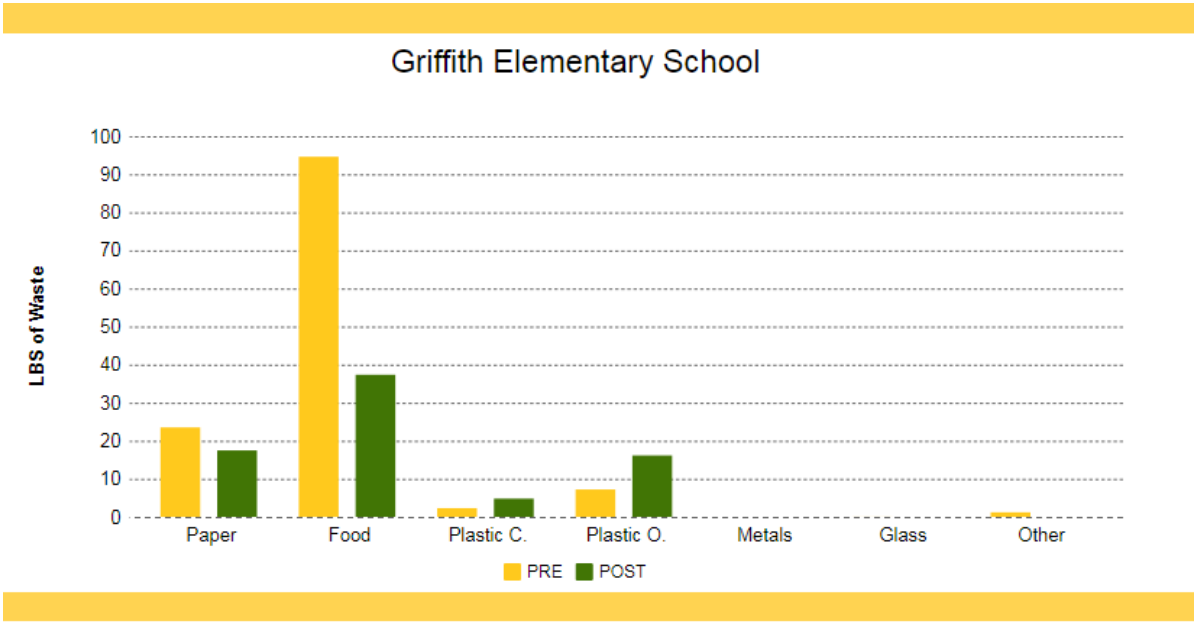
Halls Ferry Elementary

Pre-Waste Audit: 42.52 LBs of Waste
Post-Waste Audit: 60.9 LBs of Waste



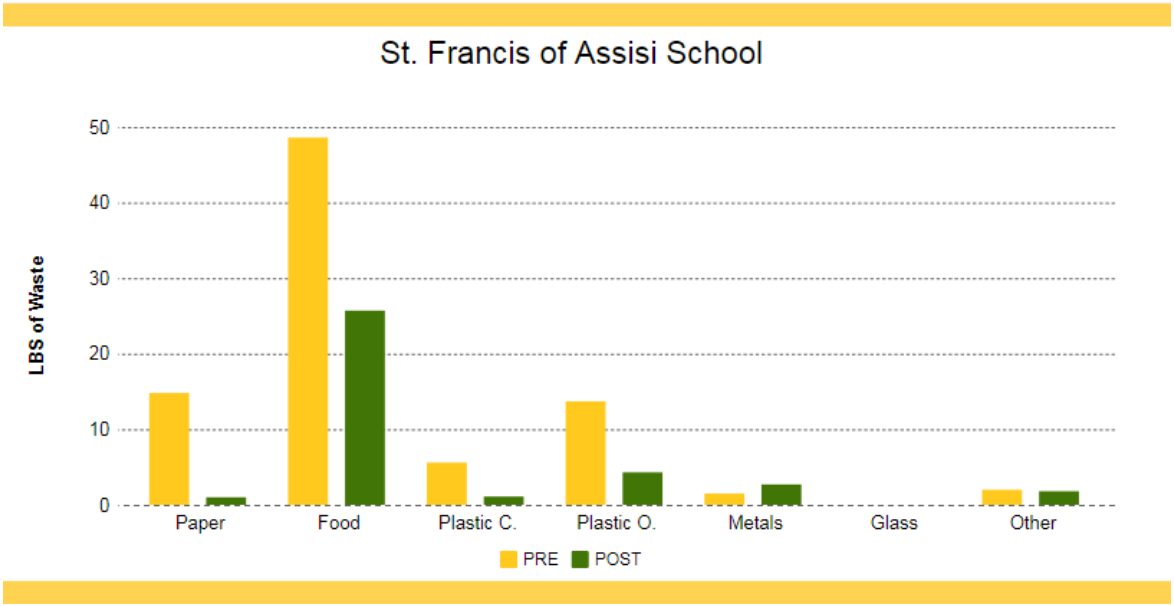
Gotsch Intermediate

Pre-Waste Audit: 285.7 LBs of Waste
Post-Waste Audit: 209.3 LBs of Waste



Griffith Elementary

Pre-Waste Audit: 128.82 LBs of Waste
Post-Waste Audit: 275.73 LBs of Waste



St. Francis of Assisi School

Pre-Waste Audit: 86.2 LBs of Waste
Post-Waste Audit: 36.6 LBs of Waste

School Projects and Green Team Initiatives

Gotsch Intermediate

Nicki Hejlek

Gotsch Intermediate set out to learn better ways to reduce, reuse and recycle in the building. Mrs. Hejlek hoped to include students, staff, and the community in the projects that helped to highlight the importance of recycling and how the practice of recycling helps build a better tomorrow for all. To achieve these goals, the school set-out to change the way things were done, particularly in the cafeteria. After forming a Green Team and conducting the waste audit of the school the students were ready to get to work. While the Green Team met after school to learn more about waste and recycling, even visiting a local landfill, the students worked hard to make changes in the cafeteria. Students trained to be ambassadors and monitor lunch periods in the cafeteria and worked with cafeteria staff to replace single use sporks with washable, reusable silverware. Additionally, the students worked with the staff to look at what was being wasted in the cafeteria and make changes to the amount of food being served and the containers the food was being served in. This made a big difference in the amount of waste generated in the cafeteria. The students even started a worm bin in their classroom to further reduce the amount of food wasted in the cafeteria and help build awareness of the issues they observed during the waste audit.

Griffith Elementary

Shelly Godfrey

Prior to the ESN program, Griffith Elementary had very little awareness for recycling. Staff and students occasionally used classroom recycling bins, but the majority of the waste collected went straight into the trash bin. Styrofoam trays were used for student trays along with plastic utensils, dressing cups, and napkins. All of the cafeteria waste was collected in one trash bin with no recycling efforts in place.
ESN worked with the 6th graders to help build awareness and engagement for the project among other classes. These students worked to write persuasive essays about recycling, organized a schedule for collecting recycling bins, and worked to educate their person proper recycling practices. When the students first started going into rooms to collect the recycling bins, they helped educate other students (and some teachers) what items could and could not go into the recycling bin. The students became extra aware of what they were throwing away and what they were putting in the recycling bins and even parents began asking the Green Team about recycling. Griffith has plans to expand their Green Team next year and focus on recycling in the cafeteria.

Halls Ferry Elementary

Julie Vollmar

Halls Ferry Elementary had a history of building efforts towards recycling and waste reduction, but students and staff lacked knowledge of what could be recycled and how to properly use the bins. As a result, much of the items in the recycling bins were contaminated by food waste, napkins, and other non-recyclable materials. Going into the project, the school wanted to raise awareness about recycling and improve their overall

single stream recycling processes. Two major initiatives were implemented as part of the ESN project year. Fourth grade students created lessons to teach each classroom using props, videos, PowerPoints, games and other teaching tools. Additionally, these fourth graders took turns monitoring lunch shifts for a period of three weeks. Ms. Pam, the school custodian, even got in and helped reinforce students for doing the right thing. Finally, the students and Ms. Pam made recycling mobiles to hang in the cafeteria to help remind students what could be recycled. Within the first week of implementing our projects, Ms. Pam reported that she was able to fill the recycle container all the way while only filling the waste container about a third of the way, typically the opposite of what normally was collected. Students also made recycling mobiles to be put up at the start of the next school year to kick-off the school with a reminder to recycle.

St. Francis of Assisi School

Mike Herries

St Francis of Assisi (SFA) is a Preschool/PreK through 8th grade Archdiocese of St Louis elementary school, located in south St Louis County. SFA has 300 students on our campus. This school year SFA has been involved in several projects which revolve around the theme of sustainability, including the EarthWays Center ESN – Pilot School Program. The year started out with a school wide waste audit which gave us a baseline of our waste production and areas which we could work on to improve. We also conducted a pre-audit waste survey to check student's awareness. Our audit identified that we did not really understand the difference between trash and recycle. Our waste audit quantified one (1) days accumulation of waste and we found that we were landfilling a significant amount of material that could be recycled. One of the biggest issues was the amount of Ziploc bags we use. These are used primarily for snacks in our preschool and primary grades; however we found that this single stream of waste was in the range of 16% of our total waste…yikes. A quick note to parents when we got our numbers resulted in a "we can fix this!". The fix was not so simple, although most parents said that they would change (use reusable containers, etc) what really happened is this. Parents packed snacks in containers, students threw the containers away or left them at school. Our great container fix lasted a week and most parents went back to sandwhich bags! So we found another way, Trex Recycling who allows us to collect film waste (grocery bags, dry cleaning bags). Now parents love us, we are in competitions with other schools for a plastic recycled material bench and a big part of our waste is out of the landfills. We have our bins available during time when the school is open to our Parish so our larger community can participate.

Our Green Team, the 4th & 5th graders worked hard to educate the school. They labeled waste bins with what can go in them, created skits and songs (at the School Advent Program) to teach the school and classes about recycling, and so much more. Two Green Team students monitored the cafeteria each day to help direct and taught students on which waste bin the waste goes when they are finished eating. Green Team students also went into classroom and audit what is in the classroom waste bins. The school audit classroom program has brought all grade levels into the project. The results are posted monthly and are available for all to see. All of these efforts led to a significant decrease in trash getting sent to the landfill.

Challenges

Every school and school district is distinct. Each school presented their own challenges and obstacles as they tackled the projects they set out to complete. Prior to starting the ESN program, teachers identified lack of knowledge and resources as a barrier in completing successful projects. During the one day training workshop for ESN teachers, this was addressed as teachers explored concepts of recycling, reducing, and reusing and even visited a local Material Recovery Facility. This equipped the ESN teachers with the knowledge they needed to teach the other students and adults in their school community. After completing the ESN program for one year, ESN educators noted that time and difficulty getting other members of their school environment on board as the largest barriers to their projects success. ESN educators noted that being part of the ESN network allowed them to feel supported, to brainstorm and troubleshoot with colleagues despite challenges getting other teachers in their school onboard.

Several schools encountered set-backs in the results they were seeing throughout the year, these set-backs were attributed to time-off school for breaks such as winter or spring break and changes in who was picking up the trash/recycling. Many schools noted that younger grade levels met expectations in recycling, maintaining their recycling habits, and overall waste reduction better than older students. Difficulties in scheduling waste audits proved challenging at the end of the school year, and it was suggested to move this portion to the month of April.

Growing the ESN Program

While the first year may be over, the work of the ESN program is just beginning. Funding for a second year of the ESN program was secured through a grant from the St. Louis – Jefferson Solid Waste Management District. This grant funding will be used to expand the newly created network to a second cohort of educators, from around the entire St. Louis City region including schools within the City. Recruitment for the new cohort of educators is currently underway for the 2017-18 academic year. These teachers will begin their training with a workshop in August/September, form their Green Team, and implement projects. Focus for the second year will be on connecting the teachers to each other, strategies for overcoming the obstacles identified by our pilot year educators, and more.

Current ESN schools and educators are committed to continuing the efforts they have initiated during the 2016-17 school year. Gotsch Intermediate hopes to expand their small composting efforts and continue the Green Ambassador cafeteria program they began this year. St. Francis of Assisi School hopes to expand their recycling efforts to the parish community that utilizes the school building during evening and weekend special events. Julie Vollmar's 4th graders from Halls Ferry Elementary are excited to continue recycling efforts for the next year with their recycled mobiles kicking off the start of the school year. Hall's Ferry is also hoping to reintroduce composting at least once per week with a focus on composting for their school garden. Griffith Elementary plans to start the next year off with a big Green Team kick-off to engage the entire school in becoming more waste aware. Mrs. Godfrey also plans to expanding conversations with cafeteria staff to become more engaged, trained, and ready to take on recycling projects.

EarthWays Center staff will stay connected with the first year cohort teachers, inviting them to attend all meetings and trainings during the second year. This will help the network grow and stay connected. Additionally, work to expand the amount of resources provided in the resource guide will be done to help increase the knowledge and understanding of ESN teachers.

Comments Collected From Students:

- *We need to help and have more recycling*
- *We learned to recycle the right things*
- *I was so surprised by the food waste we found, chicken bones, cheese, etc.,*
- *Good to do this with experts - we learned!*
- *That's wasteful, we shouldn't do that. It's not good*
- *I found books, perfectly good books*
- *It stunk*
- *We should make an assembly and teach everyone*
- *Unbelievable how much trash there was*
- *Good to know we got to recycle today, I felt great!*
- *This was at least 3lbs or more*
- *More wet waste than anything*
- *We learned why it is important to recycle, reuse things - it's important*
- *We could create something out of the trash*
- *I feel like this is really helpful when we are at home we could put plastic bottle in recycling cans to help out and reuse stuff*
- *I was surprised that it was really gross, I didn't do as much even though some girls didn't even*
- *Gross but lots of fun*
- *It was worth it - feeling like we're saving the animals and that helps us. Less animals means less people in the world.*
- *At first I thought the bees were going to both us, but then I got into it, and the bees didn't bother me. We were helping the bees and not we need to teach people about the trash and bees*
- *It was fun to do*
- *Pretty surprised, slimy, nasty, disgusting garbage helped environment and people*
- *At first, oh my God, couldn't believe going through trash but then it became addictive and I got into it*
- *I was overall surprised because we went through so much trash and it felt good because we were recycling*
- *This experience brought us all closer together, we interacted more than we usually do*
- *Do this all the time, it's way better than doing schoolwork*
- *Surprised how much the trash stinks*
- *We need to stop littering because people have to pick it up*
- *Never going that again!*
- *I wasn't bothered by the trash because I clean up every day*
- *We have recycling bins and there was still so much in the trash*
- *I got a weak stomach - I can't do this*
- *Everything goes in its place*
- *Recycling and putting stuff in the environment is good*
- *Pick-up our community*
- *We can have a recycling day at the school*

- *We could go around to the classrooms and teach about putting trash in correct bins*
- *Recycling posters and bulletin boards*
- *Recycling competition*
- *This was fun. I want to be part of a waste audit. We should make this a club.*
- *We could make a commercial or a tv show [to teach others]*
- *There were a lot of milk cartons*
- *So much grody, soggy paper, towels, and even things not supposed to be through away*
- *There was a lot of soggy, wasted food that didn't need to be wasted*
- *We could put this information on Promethean boards to help teach people*
- *Maybe we could reuse the glue sticks instead of throwing away before they are used all the way*
- *Learned we should try to reduce what we are throwing away, especially recyclable stuff*
- *We should really put stuff in the right bins*
- *Instead of trash you should always look at what you're doing*
- *We could hang up posters with pictures of people throwing things into the right bins*
- *Songs*
- *Stickers*
- *Pictures of all the trash on the floor*
- *There's so much trash. We have lots of waste.*
- *[Recycling] is doing the right thing for the earth*
- *I noticed that if we didn't pick up trash it could hurt the world and the environment*
- *What can we do about sporks?*
- *Maybe we need more recycling bins*
- *[we could] tell others not to throw away things with recycling. Then check for the recycling bins*
- *Look for the recycling code on everything, #6 can't be recycled*
- *Found a bunch of pencil shavings*
- *[I learned that] aluminum can be recycled, metal and foil can be recycled*
- *First bag was a lot of other paper; paper should just be put in the recycling bin.*
- *The school should start using metal silverware instead of stuff we have to throw away*
- *A lot of people don't care about recycling. We should make it fun for them. If you recycle you get candy…*
- *Instead of milk cartons we could use plastic cups to wash and use*
- *[I] saw a black skeleton toy that was perfectly fine – that surprised me*
- *Lots of dumped out milk*
- *An eraser?*
- *There was so much recyclable stuff in the trash*
- *We had so much leftover lunch stuff*
- *I was surprised by the food waste*
- *So much wasted homework!*
- *[I found] a game to a DS, perfectly fine. I don't know why they put it in there.*
- *I learned that not everybody knows what can and can't be recycled*

Ideas:

- *Using actual cups, reusable*
- *Put recycle signs on peoples backs to help teach people*
- *Try bringing lunch instead of buying*
- *Go around and ask teachers how much gets recycled*
- *Weigh how much every month*
- *Talk to Dr. Powers*
- *Check recycling bins and trash cans and put signs to remind people*
- *Could have janitor look in recycling bin and put a note on teachers desks to remind them to recycle*
- *We need to teach the school*
- *What if we make books that say how to recycle that kids can learn and keep at their desks*
- *Or bookmarks!*
- *Should be a wet recyclable can for milk cartons*
- *Could be a wall with posters in the school*
- *Surprised because…*
    - *people throw away t-shirts*
    - *There were a few items*
    - *How many milk cartons there were full*
    - *How much container plastic there were – so much!*
    - *The amount of food waste*
    - *Juice boxes wasted*
    - *How much food people didn't eat*
- *I actually had fun getting dirty because we actually did something to help*
- *Learned recycling helping the earth*
- *There are many different things that can be recycled*
- *Didn't know glass could be recycled*
- *Maybe at lunch we could put 1 bin for recyclables*
- *Should go in and show how much food is being left behind*
- *If we do it right we won't have to audit*
- *Keep wet waste basket and dry waste. Have a teacher or student help teach kids.*
- *Tell people to we are filling up landfills up with so much garbage, we could have more things to reuse*
- *Show [the school] what they are throwing away*
- *Bring more recyclable containers*
- *Celebrate Earth Day – have more than one so we can talk more*
- *Put up signs to recycle and keep recycling to help our earth*
- *Have a recycling contest*
- *Classroom that recycles the most could get a pizza party.*
- *It was awesome*
- *It was disgusting*

- *Stop throwing the wrong things in the wrong bin*
- *I learned there were two kinds of plastic, one is recyclable and one isn't*
- *We should label bags*
- *I was thinking… "eh"*
- *I just liked it because it was dirty*
- *It's gross but it's very fun*
- *Someone threw this whole thing away!*
- *I was so grossed out I was having fun*
- *We should be careful of what we throw away*
- *We should label all our trash cans and do our own sorting*
- *We need to set a good example*
- *We can make a video*
- *We could talk about sorting the stuff*
- *KSFA on Youtube*
- *Let's make a commercial*
- *Make posters! Should always tell what could be recycled*
- *Tell me sister we are getting to have a safe environment by trying to help the environment*
- *We need to keep stuff out of the landfill*
- *Conserve water and energy!*
- *You can't just throw all your trash in one bin, because if it's recyclable you're wasting possibilities*
- *I thought it was cool and I learned the different ways to throw stuff away*
- *Don't just throw everything in one bin*
- *Think before you throw anything away*
- *Sometimes you have to take time to think before you throw away*
- *Takes longer for recyclables to break down in the landfill taking up more space*
- *Think before you trash poster*
- *Teach to take more time and think about our trash*
- *Make a presentation*
- *Have multiple bins and make a fun challenge to see if it works*
- *Label trash cans - with what can go in*
- *Put up posters around the school*
- *Make a play to tell people about recycling and the landfill*