GEORGIA ENVIRONMENTAL HEALTH ASSOCIATION

JOURNAL

VOLUME 44 • SEPTEMBER 2023

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About the Georgia Environmental Health Association

The Georgia Environmental Health Association (GEHA) is a non-profit, professional organization, dedicated to promoting, supporting, training and registering, individuals working in environmental health fields throughout government, academia, industry and business.

GEHA History

Georgia Department of Public Health Environmental Health Section

Inspections and permitting of: on-site sewage management systems, food service establishments, tourist accommodations, personal care homes, institutions, and public swimming pools. Additional programs include: childhood lead poisoning prevention, rabies and vector control, injury prevention, hazardous materials exposure investigations, Georgia healthy farmers, epidemiological investigations, indoor air quality, nuisance complaints, individual and non-public water systems, and occupational health assistance.

Georgia Department of Agriculture Food Safety Division

Inspection and permitting of: food products including meats, eggs and milk in grocery stores, bakeries, food processing plants, bottled water and soft drink bottling plants, farmers markets and meat and seafood dealers. Additional activities include: inspection of all commercial scales and fuel pumps for accuracy, licenses and monitors commercial nurseries, lawn care companies, exterminators, pesticides, pet and animal industries, tests dairy cattle and equipment, assures proper formulation of fertilizers, pesticides, feeds and fuels, enforces fair standards in the purchase of grain and livestock, inspects bedding manufacturers for quality and proper content, monitors the health of livestock in the state as well as those imported into Georgia.

Academia

- University of Georgia College of Agricultural and Environmental Sciences
- University of Georgia College of Public Health
- Georgia Southern University College of Public Health
- Georgia State School of Public Health
- Fort Valley State University Master of Public Health

Georgia Business and Industry

Georgia business and industry support and encourage a wide variety of environmental leadership initiatives.

They share a commitment to the environment based on the principle that they shall conduct business in ways that protect and preserve our environment. Furthermore, they promote a philosophy of shared responsibility, where all participants in the supply chain accept responsibility for the environmental impacts occurring in their specific part of the chain.

Working together with suppliers, customers, regulators and other environmental partners, Georgia business and industry achieve an effective balance between responsible environmental and economic stewardship.

GEHA is incorporated under the laws of Georgia, and the recognized Georgia affiliate of the National Environmental Health Association.

GEHA is not an official part of the Georgia Department of Public Health or the Georgia Department of Agriculture but its membership is comprised of many employees from these two Georgia Departments as well as members from the private sector and academia.

The Georgia Environmental Health Association is a 501(c)4 ***non-profit organization.***

Contact us:

gehaonline@gmail.com

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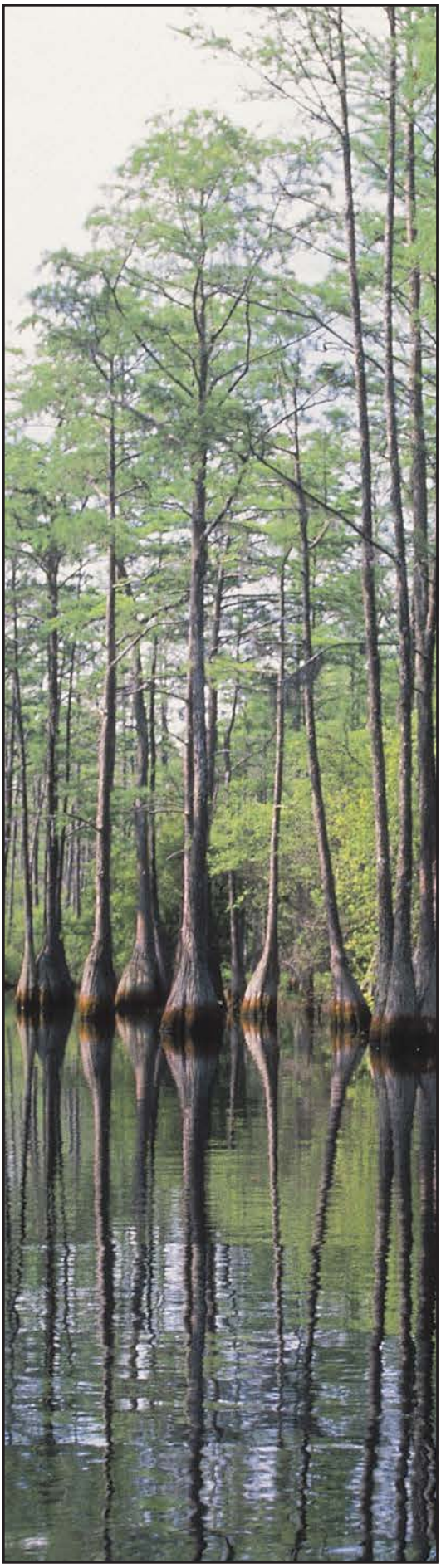
CONTENTS

LETTERS

ARTICLES



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GEHA President: Here We Are...Crushing It!

By: Melinda Knight, BSA, REHS
District Environmental Health Director, District 4
GEHA President

GEHA Members and AEC Affiliates:

Thank you so much for the dedication and support over the past 4 years of my tenure as President of GEHA. It has been an unprecedented term to say the least. What started out as a normal one-year cycle, quickly turned into three years with the pandemic, and now we are closing out the 4th and final year with the IEHS Conference in Jekyll Island. It truly has been an honor for me to be a part of such a dedicated and hard-working membership!

The resiliency that I have seen over the past 4 years has been monumental! Coming straight from COVID-19 into the high demands of the housing market and on-site sewage programs, new body art rules that have been on the horizon for a while in Georgia, and the changes in the food industry forcing an abundance of mobile food units to take our communities by storm. These are just a few of the “big” things we have all been working tirelessly with over the past few years, never mind the tremendous amount of work that never ceases to find its way to our desks. I'm baffled at what all has changed in such a short time. Yet here we all are…crushing it! I believe that environmental health, no matter what program or location, is not meant for the weak. There is an uncanny amount of grit that we all hold within us that makes environmental health successful. Take a moment and be proud of yourself. Be proud of your team. Be proud of your colleagues. Be proud of the progress we have already made and that which will come from the strides forward we take now.

When I began my career in rural Meriwether County in September of 1998 as an environmentalist in public health, I honestly thought I would be pulling rabid raccoons out of trees for testing. Although, there have been numerous opportunities of picking up suspected animals and sending the heads off for testing, there has been so much more to environmental health than anything I could have imagined. And plenty of stories to tell along the way. One of my favorite parts of educational trainings, such as the AEC, is the time we all get to sit around after hours and share the ridiculous, grotesque, hilarious things that we see in the field, in our facilities, and at times, in our own offices.

We all have "those" stories to tell. Whether it be a complaint from the local gentleman's club, a foodborne outbreak, the elderly lady up the street with too many cats, the local farmer with diseased produce, the irate restaurant or convenience store owner, or a septic installer that always seems to find the bad lots. One thing that remains true at the heart of our stories, is we serve a population that needs us. Albeit at times we are exasperated, tired,

Continued on Page 7

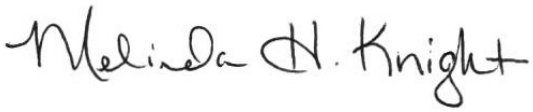
Continued From Page 6

overwhelmed, overworked, under paid…etc.…etc., we are necessary in our communities. What we do, matters and it matters a lot!

On behalf of GEHA, I want to thank you all for what you do. You have made a difference in your communities, and perhaps even bigger than that, in the way environmental health will continue to change for future generations. For the science you bring to work every day, and for the commitment in your work that you take home all too often, YOU have made someone's life better! Keep up the good work!

I would also like to take a moment and thank those that continue to make GEHA better! The GEHA Officers, Directors, Committee Chairs and Membership are bar none, the best of the best! I am so thankful for each of you and for the influence you all have had on my career over the past 25 years. I look forward to the changes we are striving to implement with increased training opportunities around the state in the coming years. Thank you for being supportive, pro-active, and open to new ideas on ways to further the mission of GEHA in the State of Georgia.

All my best,



GEHA President Elect: We Make A Difference

By: Stephen Stanley
Emergency Preparedness/Facilities Manager Chatham County HD
GEHA President Elect

Dear GEHA Members and IEH Members,

Welcome to the 2023 GEHA and Interstate Environmental Health Seminar at the beautiful Jekyll Island. We are lucky to have and be able to share such a wonderful destination with our Interstate guests. Make the best of your time here and visit the beach, the Georgia Sea Turtle Center, play a round of golf, or go for a stroll on the walking trails. Truly indulge in what our Georgia coast has to offer.

With this being our second conference "post" COVID, we have all been able to slow down and reflect upon the last few years. While there was a lot of negative impact in the world, jobs, the workforce, etc. I believe there is some good that came out of this pandemic. The thing that stood out most to me is that the pandemic highlighted Public Health overall but even more so the

importance of Environmental Health. When SPOC's needed to be stood up, who did they call for help? Who was depended upon to provide the manpower for the non-clinical rolls? When they had an issue that they didn't know how or what to do who did they reach out to? From setting up tents, to providing traffic control, data entry, and whatever else they could throw at us, Environmental Health was there and got the job done. Not only did we handle those roles, but we were also still handling our day-to-day roles as well. I have said for years that Environmental Health was the Navy Seals of Public Health. If you need the job done but don't know who's supposed to do it, then give it to Environmental Health and rest assured they will find a way to get it done. We are the true Swiss Army Knives of our industry. As Environmental Health Staff we need to take pride on the dependance that is placed upon us and know that while most of the world may see us as just restaurant inspectors or the people they call when they need a new septic system, we play a much bigger roll not only in our day-to-day, but in Public Health overall. So, take advantage of the fact that we have representatives from 8 different States gathered at one location who are just like you and have been through similar situations and take time to meet new friends, grow your network, and most of all take pride in the fact that you are a part of such wonderful organizations that DO make a difference in your communities.

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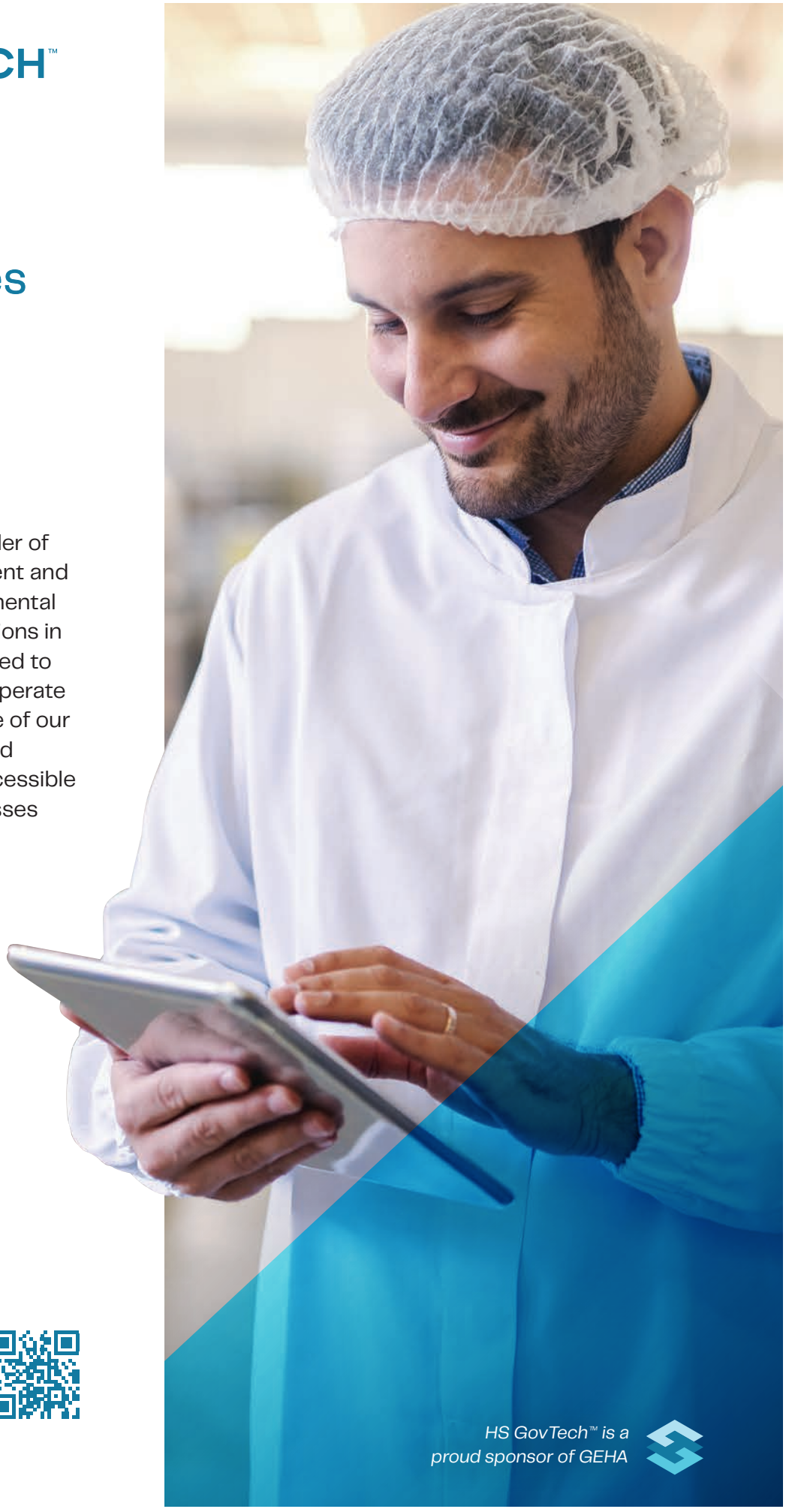

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State Environmental Health Director: We May Be Different, But Our Mission is The Same

By: Galen C. Baxter, REHS
State Environmental Health Director
Georgia Department of Public Health

This is the first time in history that we've had 5 different generations in the workplace: The Greatest Generation, Baby Boomers, Gen X, Millennials, and Gen Z. Add to that, each "speaks" a different language and has different perspectives and motivations. Challenging? You bet. Impossible to overcome? Not at all!

While there are many differences among our EH workforce, the overall mission is the same – to prevent illnesses and outbreaks, protect the public's health, and promote well-being by educating and informing.

When I stepped into this role as the State Environmental Health Director in September 2022, I had one vision: to create an Environmental Health program that attracts candidates with integrity, increase retention amongst our current EHS, provide outstanding customer service to both our internal and external customers, and create a workplace culture that fosters personal growth and development.

We have begun this process with the creation of subcommittees focused on recruitment and retention, training, leadership and the 10 Essential Services of Environmental Health.

In the few months since the creation of these subcommittees, issues have already been identified for improvement, and I am looking forward to the many positive outcomes ahead.

Coming together for a conference such as this provides camaraderie and a platform to share ideas, learn about new trends and grow and develop into the sharply honed Environmental Health Specialists for tomorrow.

I hope you enjoy the sessions and connect (or re-connect) with

your counterparts from the other states who are in attendance this year for the 77th Interstate Environmental Health Seminar!

Sincerely,

Ag Commissioner: Ag's Success is State's Success

By: Tyler Harper
Commissioner
Georgia Department of Agriculture

It is an honor to serve Georgia's farmers, producers, and consumers every day as our state's 17th Commissioner of Agriculture. As Commissioner, I am proud to partner with the dedicated professionals at GEHA to lead Georgia's agriculture industry into the future, and I look forward to our work together ensure Georgia agriculture continues to thrive while becoming more efficient, sustainable, and profitable for our farmers and producers.

It has been said many times that farmers are the original conservationists, and, as a 7th generation farmer myself, I believe that statement rings true. Here in Georgia our farmers and producers, who make their living off the land, know full well importance of safeguarding our state's abundant natural resources and environmental health. Every day, Georgia farmers are implementing new, innovative technologies and systems to produce larger yields while using less resources, and I believe investing in the next generation of education and technology is vital to the continued success of our industry and our state as a whole.

Agriculture is Georgia's number one industry – contributing roughly $75 billion to our state's economy, employing almost 400,000 Georgians, and sustaining local economies across Georgia. Simply put, agriculture's success is our state's success.

As Commissioner, I am committed to continuing that success, empowering our state's farmers, and leading our industry into the future.

I look forward to seeing and meeting with GEHA members at the 2023 annual conference, and I look forward to our work together to support Georgia farmers and producers and protect our state's abundant natural resources. Together we can ensure the success of our number one industry for decades to come.

God Bless & Keep Plowin',

Septic Installer Field Proficiency Project Continues Efforts

By: Jeremy Robinson *(EHS)* **and Jill S. Reade** *(Environmental Health County Manager, Tift County)*

Two members of the Georgia Department of Public Health in South Health District and MPH program alumni with Fort Valley State University have continued their capstone project after graduation. Jeremy Robinson and Jill Reade (Class of 2022) while obtaining a Master of Public Health (Concentration in Environmental Health) completed a Field Experience capstone that involved a commitment of three hundred contact hours surrounding environmental health. The purpose of the Field Experience Capstone is to allow the MPH student to apply the knowledge gained throughout their course of study and apply this to actual real-life, work-related situations.

The goal of their field experience project was to develop and implement a field proficiency exercise portion in addition to the existing written exam for new septic contractors. New septic installers take a written exam to become certified and usually do not have prior experience regarding correct installation of a septic system until their first job. Instead of waiting for contractors to make mistakes and having to spend more time and effort to remedy those mistakes, Robinson and Reade identified a need to help educate new contractors at the time of certification.

It is the role of the Environmental Health Specialist in the health districts of the Georgia Department of Public Health to uphold the manual for onsite sewage and to ensure that contractors are installing septic systems correctly. Implementing a plan for a field proficiency exercise, after passing the written exam, gives the contractor an opportunity to demonstrate their knowledge while asking questions and becoming further educated. Jeremy and Jill have developed mock permits which the newly certified contractor goes by to shoot grades, lay out the system, determine proper stub out height to maintain trench depth, etc. Several individuals have inquired of a contractor exam since the project started, where field proficiency exams were conducted after the exams were passed. To create these exercises, forms were developed to support the exercises and practice “sites” were set up at each designated testing

location. These forms included new septic system installation documents, repair septic system installation information, area fill system installation, sand calculations for area fills systems, and trench depth calculation documents for each area; all items needed to successfully conduct the field training exercise.

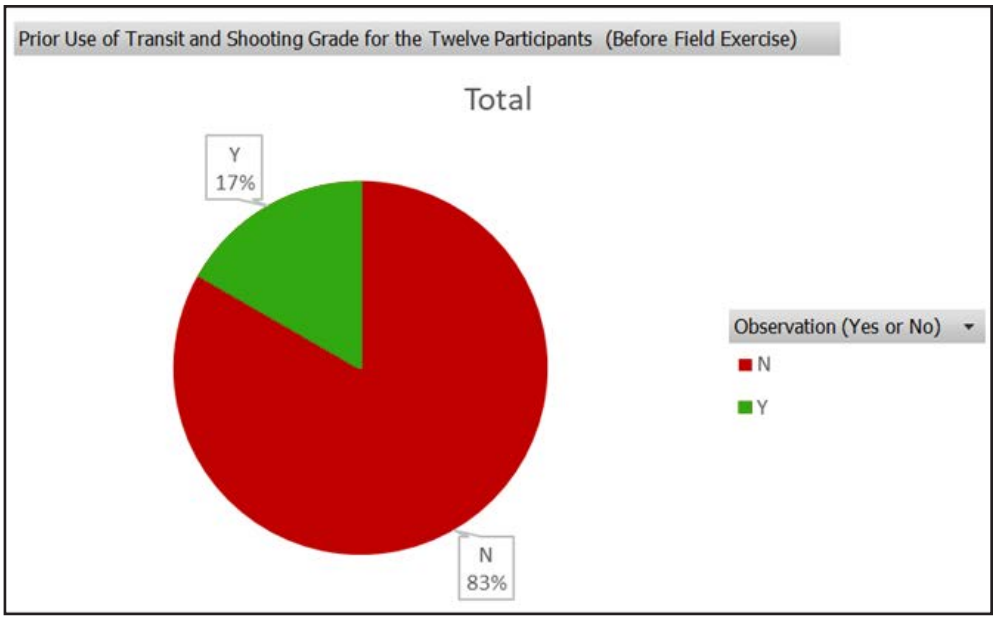
In addition to providing the new contractor with some field experience, this project also was initially intended to help build a good rapport with the Environmental Health Specialist. The project took place at the Tift and Lowndes County Health Departments. Since beginning the project, twelve contractors have gone through the field experience exercise. Six of these contractors completed the field proficiency exercise after the team of graduate students graduated from the Fort Valley MPH Program. Almost a year later, the conclusion continues to support the hypothesis as valid. It was demonstrated that many of the contractors had little to no experience regarding laying out a septic system, using a transit, and shooting grades. Those with experience that claimed they did not need a refresher walked away grateful of the time spent refreshing on how to read the permit and

Continued on Page 13

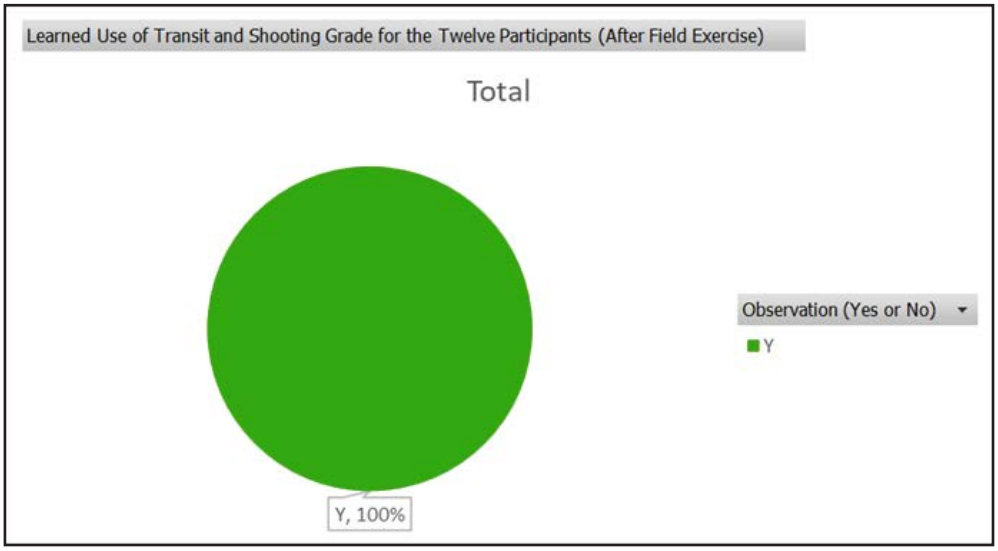
"Septic Installer Field" Continued From Page 12...

lay out the system. All of them have been very grateful and appreciative of the time spent explaining the basics of how to successfully install a system and learning how to read the permit requirements.

The contractors all provided feedback on the information and knowledge gained; this data contributed to data collected for the project. The data shows that most of the contractors passing the septic installer exam showed little to no existing septic installation knowledge, but later reported on knowledge gained through the project. This knowledge was mostly based on the prior use of a transit and shooting grades. In District 8-1, it has been found the contractors which have gone through the field proficiency exercise had no problems with passing the inspection on their first installation. Compared to past experiences, this had been a huge win for the Environmental Health Specialists in saved time and energy as well as decreasing the frustration for both EHS and installers on site. By spending an extra hour explaining expectations during the certification process on installations versus the installer having to correct the problems during the install has been very rewarding for both parties. Each contractor is sent home with a folder filled with educational materials developed by Robinson and Reade to refer to when out in the field on their own. The goal is for the field proficiency exercise to be expanded to other districts. This will enable new contractors all over the state to start off on the right foot before their first septic install and to develop a long-lasting relationship with their local health departments. Those who may wish to learn more about this process should contact Jeremy Robinson or Jill Reade directly through the South Health District.



South Health District Septic Installer Field Proficiency Exercise Chart Data, 2023



Note: This chart is produced by the South Health District Environmental Program in 2023, assessing data of the project. Data was assessed by responses among participants and analysis of the field proficiency exercise of the 12 participants.

References

Bracco Gartner, G. L., & Schlager, W. (1997). Quantification of topography using a laser-transit system. Journal of Sedimentary Research, 67(5), 987-989.

GDPH. (2022, October 12) Certification Information. Georgia Department of Public Health. https://dph.georgia.gov/environmental-health/onsite-sewage

GDPH. (2022, October 12) General Requirements for On-Site Sewage Management Systems. 511-3-1-.03. Georgia Department of Public Health. (2014) https://dph.georgia.gov/environmental-health/onsite-sewage

Reade, J. S., Robinson, J. N. (2022). South Health District Septic Installer Field Proficiency Project. Georgia Environmental Health Association Journal, 43 (July 2022), 20-22.

Do Your Facility's Surface Sanitizers and Disinfectants Leave Chemicals Behind?

By Dawn Yeomans, Ph.D.,
Research Principal, GOJO Industries

It is common knowledge that cleaning, sanitizing, and disinfecting surfaces helps prevent cross-contamination of germs. A lesser-known fact is that some commonly used surface cleaners, sanitizers, and disinfectants contain chemicals that can linger on surfaces and even transfer to the hands that touch them. With frequent use of these products in facilities every day, we need to expand our definition of 'safe' cleaning beyond just germ kill. Facilities should consider the impact that certain surface sanitizing and disinfecting chemicals may have on the health of the building's inhabitants.
Surface sanitizers and disinfectants are specially designed to reduce or eliminate bacteria, and most contain an active chemical that specifically works to destroy germs that may cause illness. That means germ-killing chemicals are deposited on surfaces every time products are sprayed or wiped. Whether the goal is to disinfect a restroom, food-contact surface, or a child's desk, when it comes to sanitizing or disinfecting surfaces, it is important to consider what gets left behind by the materials and products used. Have you ever wondered, "What happens to the chemical after it's done killing germs?"

Many Common Sanitizer and Disinfectant Products Leave Unwanted Residues Behind
One potential “hidden” danger of some chemical-based products is the residue their active ingredients may leave behind. A chemical residue is what is left behind on a surface after the product is used. Just as a paper towel can leave bits of paper residue on a surface, so can a disinfectant spray or wipe. Not all disinfectant chemicals produce unwanted surface residues – it really depends on their chemistry:

- Some chemicals – like ethanol or isopropanol alcohols – evaporate quickly, so they do not leave a chemical residue behind.
- Other types of chemicals are not very stable (i.e., do not last long) on surfaces and quickly “break apart” after killing germs. One example is hydrogen peroxide, which breaks down into naturally occurring materials: water and oxygen.
- Some of the most common disinfectant chemicals – quaternary

Continued on Page 15

"Sanitizers and Disinfectants" Continued From Page 14...

ammonium compounds or "quats" – have electric "charges" that help them to kill microorganisms, but also means they may linger on surfaces for extended periods of time. These chemicals may actually require rinsing and wiping to physically remove them from surfaces after product use (if required, this would be indicated on the product's label).

In What Types of Products are "Quats" Found?

Two of the most common antimicrobial quats are alkyl dimethyl benzyl ammonium chloride (ADBAC) and didecyl dimethyl ammonium chloride (DDAC). They are commonly used because they are inexpensive, compatible with other ingredients, and lack odor, in addition to their antimicrobial activity, making them well-suited for consumer products that combine cleaning with disinfection.

Are Sanitizer and Disinfectant Residues Common?

Many facilities use the same surface cleaning, sanitizing, and disinfecting products every day – potentially for years – so residues can easily build up, depending on the ingredients in the formulations. We recently partnered with leading toxicologists and environmental health experts to understand disinfectant chemical exposures in K-12 schools. Together, we conducted a research study in a school that had been using a common quat-based disinfectant for many years and had increased its use – as most schools did – during the pandemic. We wanted to understand how much chemical residue was left on surfaces between product uses. When desks were sampled on days when the product was not used, we were able to measure quats on more than 90% of surfaces sampled, left over from cleaning the day before![1] We also showed that quat residues on hard surfaces like desks were easily transferred to hands simply by touching their surfaces![2]

Why Are Chemical Residues a Concern?

Residues like the ones found in this study can create short- and long-term issues, which may include:

• ***Damage to hard surfaces.*** Visible signs of damage from residues include surface material corrosion and discoloration.

• ***Buildup of dirt or grime (and even germs).*** Chemical residues often make surfaces sticky, so it is easier for dirt and grime to pile on. Also, surfaces often need to be cleaned first for the sanitizer or disinfectant to work, so if there is a lot of buildup on the surface, your disinfectant may be unable to cut through the grime to reach and kill the germs.

• ***Skin irritation or allergy.*** In places like school and office settings, hands and forearms are in close contact with desks, handrails, and other surfaces on which disinfectants are used. Skin that repeatedly comes in contact with chemical residues for extended periods of time can become irritated, or skin allergies like eczema can be triggered.

• ***Problems with indoor air quality.*** Surface residues may also aggravate allergies or other sensitivities such as asthma.

How to Avoid Disinfectant Chemical Residues in Your Facility

With safety top of mind, we should ensure we are not saturating our hard surfaces with chemicals that may be touched for hours each day, potentially exposing people to more risk. Here are four steps to help avoid chemical residues:

• ***Look for Surface "Signs."*** Residue is often unseen at the onset, so any change in surface feel, texture, or signs of corrosion is often an indication. Do surfaces feel sticky, tacky, slimy, or greasy, even if they appear clean? Lingering odors are also often a sign of residues. One school district was made aware of improper use of chemical disinfectant and residues present due to strong odors and discolored clothing of students.[3]

• ***Follow Label Instructions.*** One of the easiest ways to eliminate residues is to ensure directions are followed for proper application. Spot the difference between "rinse" and "non-rinse" sanitizers and disinfectants.

• ***Swap-Out Chemicals.*** Consider alternating the usage of disinfectant products with different chemicals to avoid buildup. However, avoid mixing them together!

• ***Choose Lower-Toxicity Products.*** Choosing the best sanitizers and disinfectants means doing your homework. Read the ingredients list carefully and note potential dangers such as lung or skin irritation or allergy. Consider lower toxicity or "green" cleaning and disinfecting programs. Consult independent resources like EPA's Safer Choice Standards for more information.[4]

References

1. Boles C, Maier A, Vincent M, Stewart C, Attar S, Yeomans D. Multi-route exposure sampling of quaternary ammonium compounds and ethanol surface disinfectants in a K-8 school. Indoor Air. 2022 May;32(5):e13036.

2. GOJO Industries, Inc., Field Test, Quat Measurement Pilot Study at University of Cincinnati, 10 February 2021 (300004969).

3. Midland Daily News. "Dow High students upset over clothing discolored due to disinfectant." https://www.ourmidland.com/insider/article/Vital-Oxide-15997881.php. Accessed June 28, 2023.

4. United States Environmental Protection Agency. "Safer Choice." https://www.epa.gov/saferchoice. Accessed June 28, 2023.

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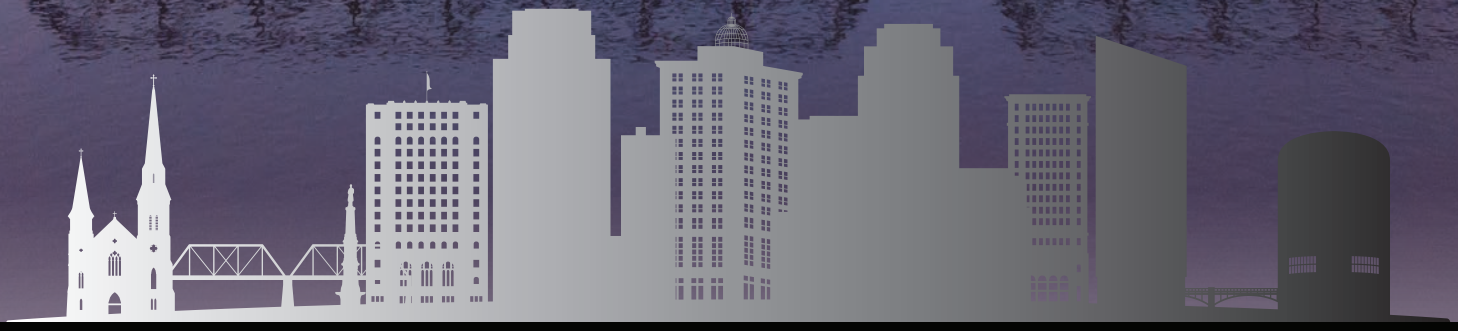

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Conference agenda is available on our webpage, www.afdoss.org/conferences/2023-afdoss-conference

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Active Managerial Control: Factors Influencing How EHS Mark Supervision Compliance Status in Food Service

By: Lauren Baker-Newton, MPH, REHS
Environmental Health Manager – Chatham County Health Department

Background
According to the Centers for Disease Control's (CDC) 2017 Foodborne Disease Outbreak Surveillance Report, "restaurants were linked to outbreaks more often than any other place where food was prepared. Restaurants were associated with 489 outbreaks, accounting for 64% of outbreaks that had a single location where food was prepared." (CDC, 2019).
The United States Food and Drug Administration (FDA) has reported that, in order to effectively reduce major foodborne illness risk factors in retail establishments, a food service business should use food safety management systems (FSMS), however in a 2018 report, it was determined that less than 11% of audited food service businesses were using a well-documented FSMS. (King, 2020).
During an inspection, an EHS is responsible for determining if the operator is practicing AMC by evaluating the systems that the person in charge (PIC) has put into practice, regarding oversight and routine monitoring of the duties listed in Georgia Department of Public Health Food Service Rules and Regulations. Per Georgia's Instructions for Marking the Food Service Inspection Report form, when "there is a pattern of noncompliance and obvious failure of the PIC to ensure compliance," then PIC duties should be marked out of compliance (DPH, 2019). Therefore, a PIC violation is not a simple observation; it is a combination of conditions and interview findings that need to be evaluated and assessed by an EHS.

Problem Statement
The contributing factors influencing how active managerial control violations are reported by environmental health specialists in Georgia during routine inspections of retail establishments are unknown.

Research Questions
1. What association does inspection data show between risk factor violations and person in charge (PIC) performance of duties compliance status?
2. What factors influence how an EHS documents compliance status regarding the fulfillment of the duties of the person in charge (PIC) when risk factor violations are observed during routine inspections?

Methodology
In Part one, Digital Health Department (DHD), Georgia's statewide electronic system used to manage food service inspection data entry, was used to compile and review all routine food service inspections conducted by each EHS during the period from January 1, 2018, through December 31, 2020.
In Part 2, a Microsoft Forms survey was distributed statewide. The survey used closed-ended questions and sought to determine the following: how EHS were trained regarding the assessment AMC when EHS marked PIC performance of duties out of compliance; how EHS defined both pattern of noncompliance and obvious failure of the PIC; the factors contributing toward uncertainty during AMC assessment; and actions EHS believed would better prepare them to assess AMC.

Results
Part 1, inspection data showed the following:
• Risk-factor violations occurred during 50% of routine inspections.
• 18% of routine inspections required a follow-up inspection.
• 12% of violations were marked as "repeat," with a 2% increase in repeat violations between 2018 – 2020.
• AMC marked out of compliance during 2% of routine inspections.

Part 2, 135 survey responses were received. Survey data showed the following:
• EHS received multimodal training regarding AMC

Continued on Page 19

"Supervision Compliance" Continued From Page 18...

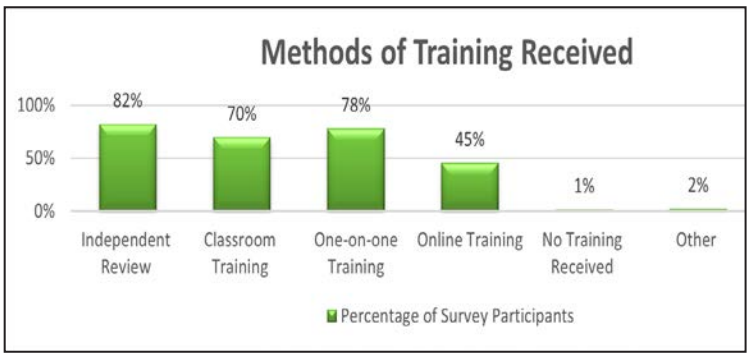
assessment. (Graph 1)
• EHS marked AMC out of compliance under differing circumstances.
• EHS held varying interpretations regarding pattern of noncompliance and obvious failure of the PIC. (Graphs 2 & 3)
• When asked to do a self-evaluation regarding their own ability to appropriately assess AMC, 68% of participants reported assessing AMC properly.
• The remaining 32% reported uncertainty when assessing AMC. The underlying reasons EHS identified as contributing to their uncertainty when assessing AMC are displayed below, with lack of understanding being the most highly reported contributor.
• EHS identified the following actions as strategies that would better prepare them to assess AMC: AMC specific training (73%); descriptive language added to marking instructions (62%); AMC assessment document (59%).

Conclusions

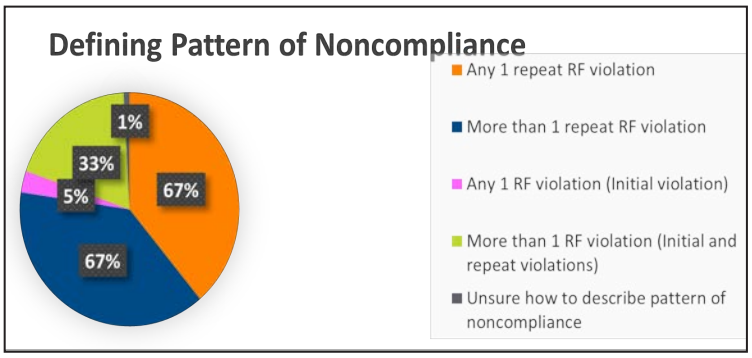
Risk-factor violations were observed during 50% of routine inspections conducted during the specified time frame. Inspection data indicated the assessment of the PIC performance of duties, as it related to AMC, was underassessed during routine inspections, as AMC was only marked "out of compliance" during 2% of inspections. Data also showed a 2% increase in repeat violations which could be inferred as missed opportunities to thoroughly discuss process gaps and long-term corrective actions with PICs during routine inspections. EHS reported receiving multimodal training regarding AMC assessment, however the varying definitions for "pattern of noncompliance" and "obvious failure of the PIC to ensure risk factor compliance," coupled with the commonality of risk-factor and repeat violations, demonstrated that training received by EHS should be evaluated for effectiveness. Uncertainty when assessing AMC was self-reported by 32% of survey participants. Fifty percent (50%) of the identified subset attributed their uncertainty to a lack of understanding, which led to an increased subjectivity as EHS were relying upon their own understanding of how to assess AMC.

Recommendations

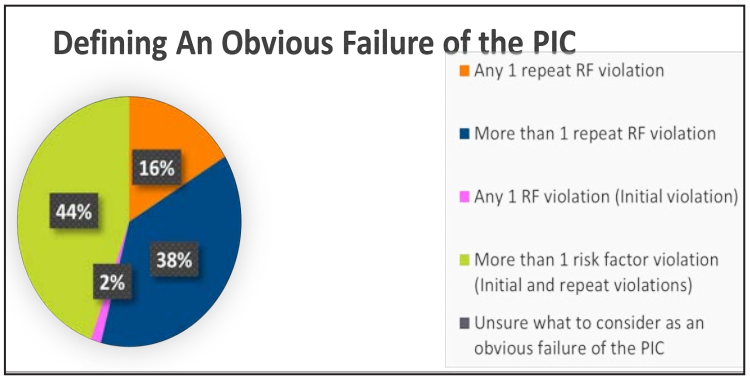
This research led to the following recommendations:
1. Amend Georgia's marking guide instructions to include concrete language regarding the assessment of AMC and a definition of both pattern of noncompliance and obvious failure of the PIC to ensure compliance.
2. Evaluate effectiveness of the training received by EHS related to the assessment of AMC.
3. Develop supplemental assessment documents for EHS to utilize during routine inspections to assist with the assessment of AMC.
4. Evaluate how EHS are assessing and reporting AMC.
5. Conduct additional research to determine what interventions would be appropriate to address the lack of understanding reported by environmental health personnel.



Graph 1: Methods of Training Received



Graph 2: Defining Pattern of Noncompliance



Graph 3: Defining An Obvious Failure of the PIC

References

• *Centers for Disease Control and Prevention. (2019). Highlights from the 2017 surveillance report. Centers for Disease Control and Prevention.*
• *Georgia Department of Public Health, Environmental Health Section. (2019, April 10). Instructions for marking the Georgia food establishment inspection report form: Rules and regulations food service chapter 511-6-1.*
• *King, H. (2020). Food safety management systems: Achieving active managerial control of foodborne illness risk factors in a retail food service business. ResearchGate. DOI:10.1007/978-3-030-44735-9*

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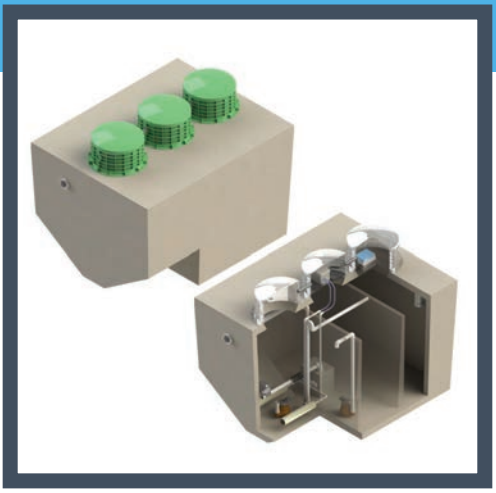
PRODUCT OVERVIEW

RESIDENTIAL SYSTEM



- Sewage enters the separation chamber from the inlet-primary treatment occurs
- Sewage gravity flows into the dosing chamber - secondary settling occurs
- The controller determines an appropriate batch size and transfers the selected volume to the reaction chamber via a transfer pump-fill mix occurs
- The air blower initiates aeration via twin fine air diffusers - reaction occurs
- Following settling, decanting occurs - discharging the supernatant through the outlet

MODULAR SYSTEM

- Sewage enters a traditional trash/grit tank - setting and dosing occur
- Sewage gravity flows to the dosing chamber - dosing and secondary settling occur
- The controller determines an appropriate batch size and pumps the selected volume to the reaction chamber - fill mix occurs
- The above grade blower initiates aeration through twin fin air diffusers - reaction occurs
- After settling and decanting, the effluent is discharged to the specified disposal means
- DWTU Treatment Volume Size: 1500, 2000, 3500, 5000 (in GPD)

HIGH-FLOW SYSTEM

- Sewage enters a traditional trash/grit tank - settling and dosing occur
- The controller determines an appropriate batch size and pump the selected volume to one of two reactors within the treatment module shown here
- The above grade air blowers in aeration through fine air diffusers - reaction occurs
- After settling and decanting, the effluent is discharged to the specified disposal means
- DWTU Treatment Volume Size: 15,000-150,000 GPD

Collaboration is key to Georgia's Rapid Response Team

By: Colby Brown, MPH
Georgia Rapid Response Team Coordinator, Georgia Department of Agriculture

In-person meetings and trainings were nonexistent for a few years, but Georgia's Rapid Response Team had an idea to get the team back together and to work on building a necessary capability – environmental sampling. Environmental sampling is a process where the regulatory authority (or even a food establishment) collects samples from the environment where foods are produced. These environments can range from food manufacturing facilities to a commercial kitchen. This type of sampling uses sterile tools like swabs and sponges to collect samples from food contact surfaces and non-food contact surfaces (e.g., slicers, utensils, storage bins, floor drains). Environmental sampling is crucial because a contamination in the environment can lead to a contaminated finished product.

The process of collecting these types of samples is mostly consistent among differing public health agencies. There may be differences in the types of tools used but a sponge and swab are the basic form of sampling tool used by all agencies that perform environmental samplings. Having tools that are similar can help in training individuals in the environmental sampling process. Most agencies also have certain teams of individuals that collect these samples (like laboratorians, epidemiologists, or inspectors). Having these expected procedures and practices can be a comfort if an outbreak were to occur, or a finished product tested positive in a regulated facility, there can be a response without much thought. What about if those individuals or teams were no longer available? What if the response was so complex that those who typically collect samples were involved in other processes? These questions led to an idea shared between South Carolina and Georgia Rapid Response Teams.

Rapid Response Teams (RRTs) are multi-agency, multi-disciplinary teams that operate utilizing National Incident Management System – Incident Command System principles and use a Unified Command Structure to respond to human food and animal feed emergencies. These teams are funded through a cooperative agreement grant provided by the Food and Drug Administration. The purpose for establishing and maintaining these teams is to minimize the amount of time between a notification of a human or animal food emergency and the implementation of effective control measures. For more information on RRTs check this link to the FDA website – FDA RRTs (fda.gov > Menu > Federal, State and Local Officials > IFSS Programs & Initiatives > Rapid Response Teams (RRTs)). RRTs are an important piece of creating and then continuing an integrated food safety system because partnerships between multiple agencies across multiple disciplines. There are subject matter experts for any type of food or feed emergency within these teams. The RRT in Georgia has brought together many partners – FDA, USDA FSIS, GDA, GA DPH, GPHL, EDP DNR, GRWA, and GA Department of Education to name a few.

The RRTs of South Carolina and Georgia began planning an Environmental Sampling Course in February of 2022. The idea was to

Continued on Page 23

"Rapid Response Team" Continued From Page 22...

bring together not only our respective RRT members but to expand the invitation across state lines and to train our team in a new capacity. The training was a collaboration between Department of Agriculture Food and Feed Inspectors, Environmental Health Inspectors, Epidemiologist and Laboratorians from both states, which does include both departments of agriculture and public health – an ultimate collaborative effort! The training course has been offered as a one-day face to face training event preceded by a virtual presentation on environmental assessments and sampling. The virtual course consisted of a presentation with discussion points which was recorded so it could be reviewed for future trainings. During the in-person training we reviewed main topics regarding environmental assessments, antecedents, sampling zones, pathogen behaviors, sampling techniques and applied that review and new training in scenarios that would carry over from classroom to our sampling practice area. We also instructed and practiced aseptic techniques (donning and doffing gloves, proper bagging of samples, etc.). We chose our training venues carefully taking note of geographical location, classroom size, amenities nearby for lodging/food, and a practice area for environmental sampling/swabbing. The courses so far have been held at two Culinary Institutes and a hotel conference area. The courses have been well attended and feedback thus far has been extremely constructive, with requests to continue offering this course. We have planned to build this course into all phases of a food or feed outbreak response – environmental assessment, traceback/traceforward, and environmental sampling.

Participating Agencies: South Carolina Department of Health and Environmental Control (DHEC), South Carolina Department of Agriculture (SCDA), Georgia Department of Public Health (GaDPH), and the Georgia Department of Agriculture (GDA).

Deep Dive into Swimming Pool Hydraulics

By: Liza Hardison, MPH
Public Swimming Pool Program Consultant, Georgia Department of Public Health

Principles of Plan Review Hydraulics Analysis Training Class" June 12-13, 2023. (L-R) 1st Row: Leslie Lanier, Liza Hardison, Laura Moore, Keli Hinson, Bonnie Turner, Anganette Davis, Eugene Polk, and Maurice Redmond. (L-R) 2nd Row: Monique Kramer, Padraic Thompson, Samuel McCullough, Ethel Hagans, James Davis, Jonathan Terry, Jeremy Robinson, Brittany Holt, and Christopher Hutcheson.

The mission of the Georgia Department of Public Health (DPH), Swimming Pool Program is to minimize illnesses and injuries associated with contaminated or hazardous conditions in or around public swimming pools. County Boards of Health Environmental Health Specialists (EHS) work to achieve this mission through training, enforcement, complaint investigations, and performing compliance inspections of all regulated swimming pools, spas, and recreational waterpark facilities to ensure adherence to design, operation, and maintenance rules.

The DPH Swimming Pool Program worked with Kennesaw State University Department of Civil and Environmental Engineering in designing a program specific training for the County Environmental Health Specialists. This training focused on gaining a better understanding of the hydraulic principles applied when designing a public swimming pool and its components necessary to circulate, filter and disinfect pool water.

The two-day course covered topics such as fluid fundamentals, conservation of energy, Hazen-Williams' equation, and basic calculations such as pool volume, design flow rate, and pool turnover rate. Additionally, students learned to calculate friction loss and velocity of moving water in pipes from empirical equations used by engineers when making total dynamic head determinations. The course also consisted of a laboratory component that complimented the lectures and supplemented the rules and regulations used by County EHS to review a public swimming pool hydraulic analysis worksheet. The hydraulic analysis worksheet is a five-page document that is required for any public swimming pool and must be completed by a licensed engineer or architect. The intent of this training was to provide foundational knowledge for the County EHS to use when reviewing a hydraulic analysis worksheet to determine compliance with the Georgia Rules and Regulations Public Swimming Pools, Spas, and Recreational Water Parks Chapter 511-3-5.

The principles of pool hydraulics training were conducted at Kennesaw State University in Marietta, Georgia in four sessions, one for the month of March, April, May, and June of 2023. Dr. Sunanda Dissanayake, Chair of the Department of Civil and Environmental Engineering and Dr. Tien Yee, Assistant Professor for the Department of Civil and Construction Engineering, conducted the course. Dr. Yee stated, "The knowledge retained during this training will remain with the Department of Public Health for a long time and will help bridge any knowledge gaps." Overall, approximately 60 County EHS with varying years of experience attended the sessions. At the end of the course, students completed an evaluation form and agreed the course increased interest in the subject of swimming pool hydraulics and suggested other County EHS attend this training.

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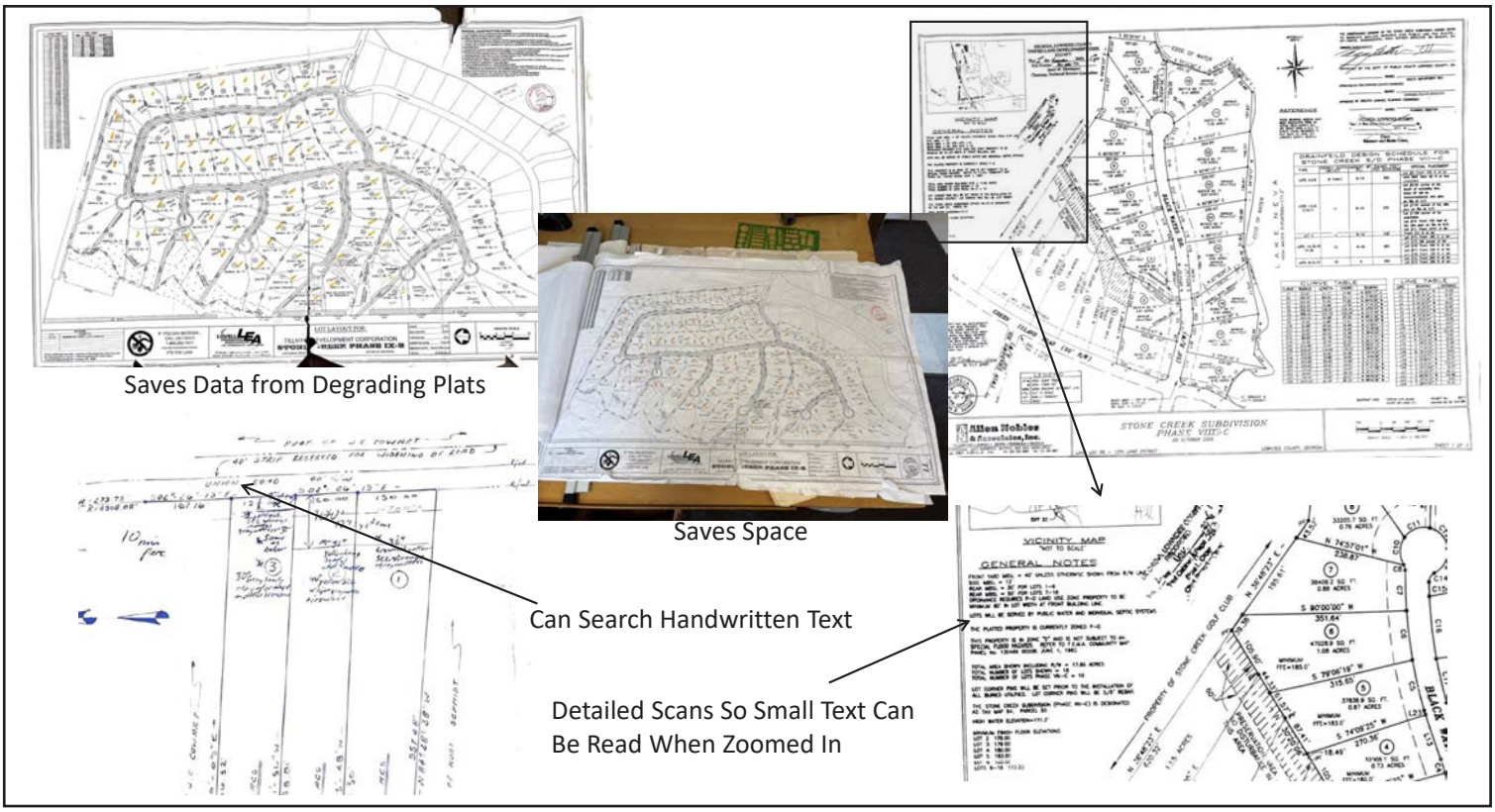


Paperless Platt Room Allows Easier Access, Preserves Data

By W. Austin Haney,
Environmental Health Specialist, District 8-1

Over the past ten years environmentalists across the state have seen a shift from physical media to digital media in their day-to-day operations. Pages of handwritten code provisions on addendums of paper food inspections are now handled with a simple drop-down menu in the digital health department (DHD). Handwritten septic inspections with drawings on grid paper can now be input in the DHD on-site and a digital drawing created with touchscreen laptops and a stylus. This shift to digital media has allowed easy tracking of data across the state and ease of use for incoming employees. New data input generally starts as a digital document, but what about physical media that has been around for 50 years tucked in a filing cabinet in your local health department? When a homeowner calls for the location of their septic system installed in 1982, what if you could simply type in an address and it appears on your laptop ready to print. This would save countless hours of searching through files looking for the original document to scan and send to the resident. The solution to easily scannable items like septic installation inspections is simple. Run them through the scanner to create a PDF file and organize the files on a cloud drive or local hard drive to mimic the filing system you use at your local health department so that they are easy to find. Large physical documents like subdivision plats, are not as intuitive. In this article, I propose a solution to digitizing large physical documents and moving your plat room into the current digital age. Subdivision plats are physically large documents that contain property boundaries, topographic maps, level three soil reports, and special notes pertaining to specific lots within a subdivision. They are generally kept hanging in a plat room or they are rolled up in bundles for safe keeping. These documents can consume a large space within a health department and can degrade over time rendering them unreadable. To preserve space and the information contained in the plats, digitization of these physical copies is a viable option.

Since 2011, with the introduction of the Cam Scanner app, there have been several iterations of smart

Continued on Page 27

"Paperless Platt Room" Continued From Page 26...

phone apps that allow users to create PDF files with the camera on their smartphone. Adobe Scan and Microsoft Lens are two apps that are readily available to employees of the State of Georgia, and both have pros and cons of digitizing a plat room. The main advantage of Adobe Scan is its use of Adobe's Optical Character Recognition (OCR). OCR takes text from an image that is uneditable and makes it into an editable (searchable) text. In my preliminary testing using both apps to scan the same plats containing both typed and handwritten text, Adobe scan will pick up handwritten street names (if they are legible) where Microsoft lens will only recognize typed texts. This is important if you want to search for keywords in older plats that were handwritten (i.e., soil type, road name, subdivision name, etc.). Both apps have an intuitive user interface that automatically detects the edge of the plat when the picture is taken, although I found that Adobe Scan more accurately finds these edges and requires less user input. The main advantage for Microsoft lens is its cloud integration with Microsoft OneDrive. As an employee of the state of Georgia, we already have Microsoft accounts and integrating your scanned PDFs on Microsoft Lens with OneDrive is as easy as logging in with your credentials. One can easily share access to your digitized plat room with everyone in your district, or anyone within your organization. With Adobe Scan, you need to get your local district to create/add your adobe account to their existing account. Then you can upload the scanned plats to the Adobe cloud. From there, because of ease of sharing, I would recommend transferring the plats to your Microsoft One Drive and store them there. This adds extra time to the process but allows you to have multiple locations for your data.

Once all the plats are organized in their respective folders in the digital plat room, anyone with access to that folder can then go into it and search for what they need no matter where they are. This lends itself to become more accessible, especially since most environmentalists are more often traveling to sites and are mobile rather than spending time in the office.

I believe that if being able to search for handwritten text, or an overall more detailed digitization is what is important to your health department then Adobe Scan is the better option. If you want a more streamlined digitization process with accounts that all health departments already have, then Microsoft Lens is the better choice. Digitizing the plat room can not only save space and preserve data that may be lost over time due to physical degradation, but also has practical uses for modern subdivisions with ease of access to data.

Tick Surveillance in Georgia, Collecting Useful Data Through Interagency Collaboration

By: Rosmarie Kelly, PhD MPH and "Tiffany" Thuy-vi Thi Nguyen, PhD, MPH
Public Health Entomologist

Ticks are arthropods in the Class Arachnida. Along with mites, they constitute the subclass Acari. Almost all ticks belong to one of two major families, the Ixodidae or hard ticks, and the Argasidae or soft ticks. Adults have ovoid or pear-shaped bodies, which become engorged with blood when they feed, and eight legs. In addition to having a hard shield on their dorsal surfaces, hard ticks have a proboscis at the front containing the mouthparts, whereas soft ticks have their mouthparts on the underside of their bodies. Both families locate a potential host by odor or from changes in the environment.

Ticks have four stages to their lifecycle: egg, larva, nymph, and adult. Ixodid ticks have three hosts, taking at least a year to complete their lifecycle. Argasid ticks have up to seven nymphal stages (instars), each one requiring a blood meal. Because of their habit of ingesting blood, ticks are vectors of many diseases that affect humans and other animals.

Larval ticks hatch with six legs, acquiring the other two after a blood meal and molting into the nymphal stage. In the nymphal and adult stages, ticks have eight legs.

While adults are the most commonly found stage of the tick because of their size, immature stages are also important to the disease transmission cycle. Typically, the larval tick picks up a disease organism while feeding. The disease organism stays with the tick during the molt and can now be transmitted to the next host. Nymphs are most implicated in disease transmission, although the disease organism does stay with the tick into the adult stage.

Surveillance for ticks has been mostly lacking in Georgia, even where tick-borne diseases have been reported. Tick surveillance is intended to monitor changes in the distribution and abundance of ticks and to assess the presence and prevalence of tickborne pathogens to provide actionable, evidence-based information on infection risk to clinicians, the public, and policy makers (https://www.cdc.gov/ticks/index.html). Tick surveillance can be active or passive and is accomplished in several different ways. Passive surveillance systems accept reports and tick submissions from the public, and animal and human healthcare providers. Active surveillance is the direct, systematic collection of ticks from the environment or from host animals.

Continued on Page 29

"Tick Surveillance" Continued From Page 28...

Drag/Flag Sampling
Many adult ixodid ticks can be collected while questing for hosts from the vegetation. Dragging or flagging is done with a 1 m2 piece of white cotton flannel attached to a 1.5 m wooden dowel. Dragging is more effective in more open areas, where a greater surface area of material would contact the tick environment. Flagging, where the flannel is waved back and forth under, in, and around vegetation or leaf litter works better in heavy vegetation. These data can be used to determine tick densities.

Carbon Dioxide Trapping
To construct a CO2 trap, simply place some dry ice in a vented, insulated container and set the container in the center of a sheet or board on the ground. If the trap will not be monitored, tape can be attached, sticky side out, on the perimeter to capture attracted ticks. A half-pound of dry ice will last about 2 hours at 80oF in an insulated container.

Live/Dead Host Collection
This is a passive method of tick collection that can provide useful information on the presence and abundance of ticks. Ticks collected from hosts should only be included in assessments of county status when travel history is considered.

Calculating county status:
• Counties classified as "established" are those where six or more ticks of a single life stage or more than one life stage of the tick were collected in the county within a 12-month period.
• Counties classified as "reported" are those where less than six ticks of a single life stage were collected in the county within a 12-month period.
• Counties classified as "no records" should not be interpreted as the tick being absent. No records could arise either from a lack of sampling efforts, lack of tick collection during sampling efforts, or lack of reporting or publishing the results of sampling efforts.
Currently, tick surveillance at the Georgia Department of Public Health (DPH) is only done in collaboration with the Georgia Department of Agriculture (GDA) tick attach study and with the Georgia Department of Natural Resources (GA DNR), checking deer and bear at check stations on Wildlife Management Areas during hunts. While this is an acceptable method of determining presence of tick species, it does not provide prevalence or density data. DPH has also collaborated with the Southeastern Center of Excellence in Vector Borne Diseases to do tick drags along Georgia's borders with North and South Carolina and Tennessee and to monitor and look at control methods for lone star ticks in State Parks.
At least two surveys of ticks attached to humans have been done in Georgia since 1990. The first, which ran from 1990-1995, was a collaboration between the Medical College of Georgia and Georgia Southern University, and is published in the Journal of Parasitology, 1996. The second study was done between April 2005 and December 2006 by the DPH. This study was not published, but information from this study is included in a paper on Rickettsia parkeri published in Emerging and Infectious Diseases, 2009.
The GDA has conducted an ongoing survey on ticks attached to animals since at least 2005. In 2018, the DPH Environmental Health Section (DPH/EHS) reached an agreement with the GDA to assist with the study in exchange for access to the data. The GDA shared data from 2005 to the present. When the Vector Surveillance Coordinator program was active (2016-2020), DPH provided tick collection kits and mailers to local veterinarians around the state. The ticks were sent for ID and testing to the National Veterinary Services Laboratories in Iowa. Currently,

Continued on Page 30

"Tick Surveillance"
Continued From Page 29...

a few veterinarians continue to send in ticks, and DPH/EHS interns are tasked with reaching out to veterinarians in their surveillance areas to collect ticks. Data from all sources are returned to the GDA, who send the raw data to the DPH for analysis. Richmond County Department of Health Mosquito Control program (RCMC) had also partnered with the State Entomologists for DPH and the GDA to survey collected ticks from felines and canines in Richmond County, GA. All veterinary clinics in Richmond County were called by the regional Entomologist to request participation and explain procedure. RCMC used the same tick collection kits, containing tick forms and vials of isopropyl alcohol, along with GDA collection forms. These were disseminated to local veterinary clinics willing to participate, as well as Augusta Animal Services. Clinics were called to check for collected ticks about once every 2 months. Ticks were picked up in vials with forms and returned to the lab to be identified, followed by shipment to GDA for verification and to be included in a state-wide survey in Georgia. This program is currently on hold. Additional tick data were collected in collaboration with the GA DNR. Entomologists and interns from DPH have been attending quota hunts at 15 different Wildlife Management areas to check deer and bear brought in for tagging for ticks. We are hoping to increase the number of WMAs where tick collecting is done when possible.

The major tick-borne diseases in the southeastern US include Lyme disease, Rocky Mountain spotted fever, STARI, ehrlichiosis, and anaplasmosis (FIG 1). In addition to tick-borne diseases, a toxin can be transmitted through the saliva of a tick bite that causes progressive paralysis, a condition known as "tick paralysis." Tick feeding also may result in mild to severe allergic reactions in some individuals. Many tick-borne diseases are successfully treated if symptoms are recognized early. When the disease is not diagnosed during the early stages of infection, treatment can be difficult and chronic symptoms may develop or death may occur. A recently discovered reaction to the bite from the Lone Star tick is that it can cause people to develop an allergy to red meat, including beef and pork. This specific allergy is related to a carbohydrate called alpha-gal.

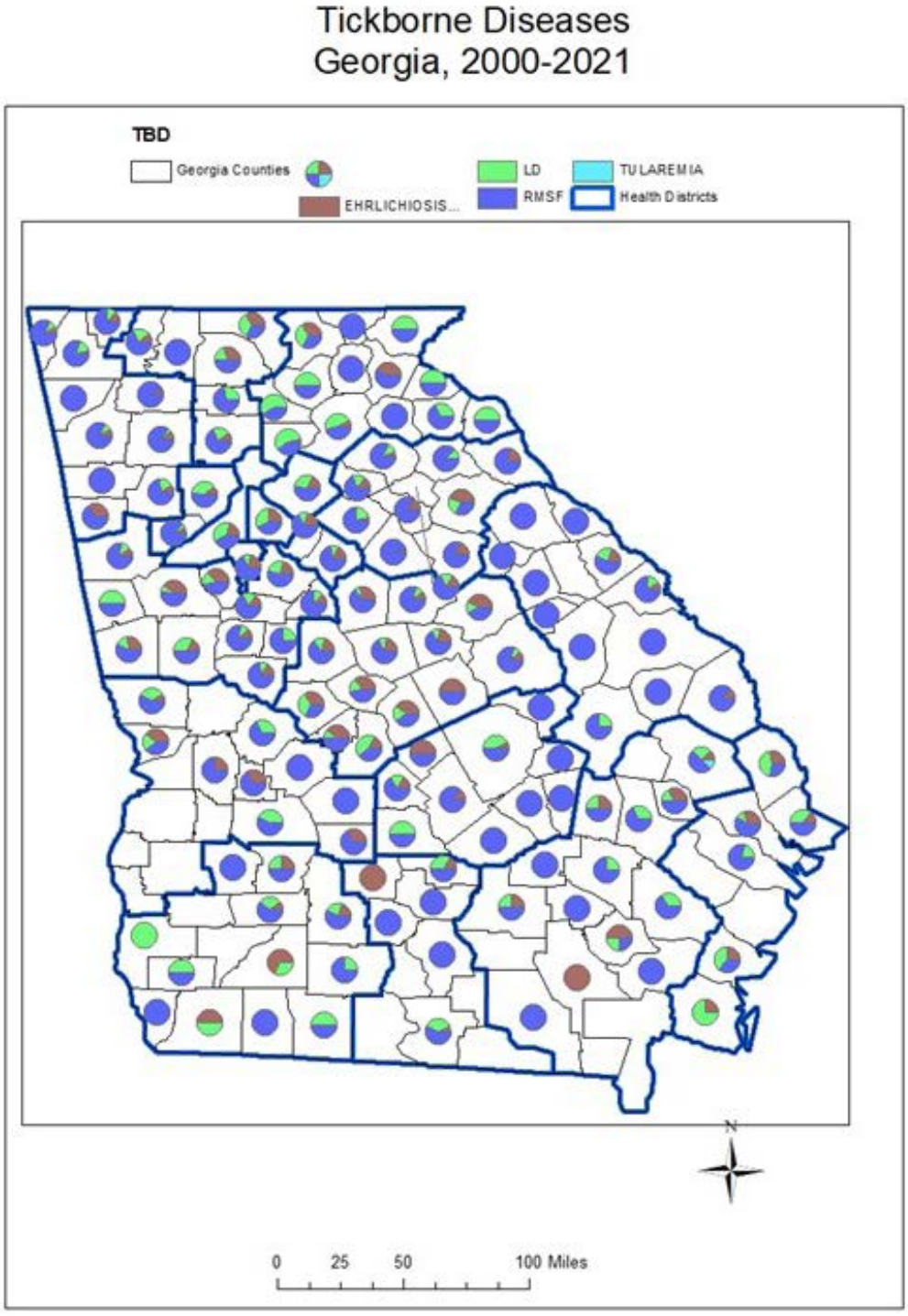


Figure 1

Current Goals:

• Obtain a better understanding

Continued on Page 31

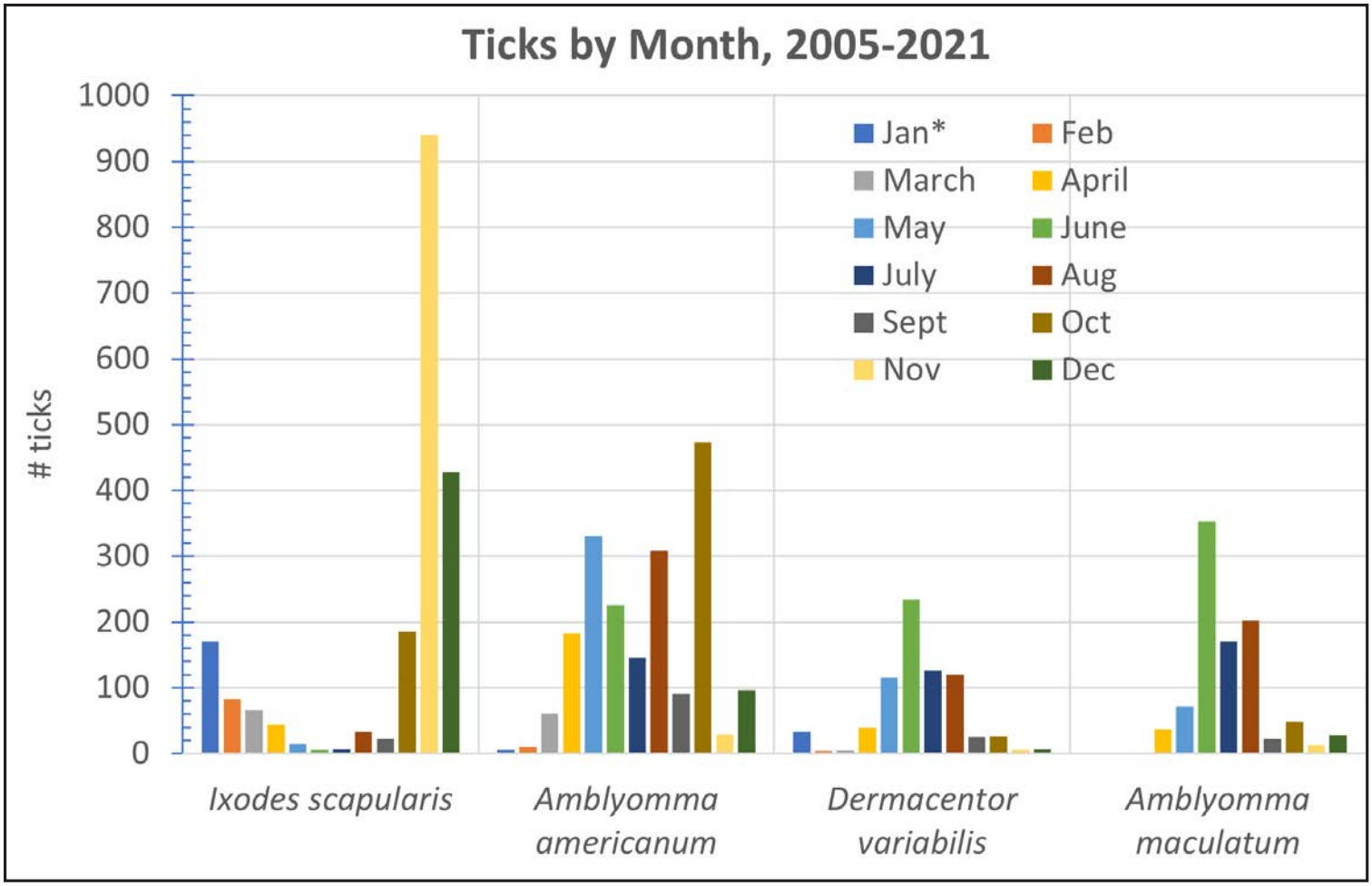


*Figure 2: *does not include 2000 larval ticks collected from one source in January*

"Tick Surveillance" Continued From Page 30...

of tick species found in Georgia
• Map potential tickborne disease risk
• Monitor for Haemaphysalis longicornis (East Asian or longhorned tick)
To date, Asian longhorned ticks have been found in Arkansas, Connecticut, Delaware, Georgia, Kentucky, Maryland, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, and West Virginia.

Data collected with the help of interagency cooperation are put into an Excel spreadsheet for analysis. Information collected include the date the tick was collected, the tick genus and species, the life stage, the number collected from the animal host, and the county where the tick was collected. Additional information (accession number, case number, and species to which the tick was attached) are preserved in an Access database.
Data are analyzed (FIG 2) and an annual summary is created and sent out to collaborators. The most current summary can be found at https://dph.georgia.gov/environmental-health/insects-and-diseases.

Acknowledgements
I would like to thank everyone who assisted with this tick surveillance project. We could not collect useful tick data without our collaborators.

RESOURCES

https://dph.georgia.gov/epidemiology/zvbd/tbd
https://www.slideshare.net/AllergyChula/alpha-gal-allergy-red-meat-allergy
https://www.cdc.gov/ticks/longhorned-tick/index.html
https://www.contagionlive.com/news/rutgers-investigators-create-pictorial-key-for-accurate-identification-of-asian-longhorned-tick
https://zookeys.pensoft.net/article/30448/
https://www.cdc.gov/mmwr/preview/mmwrhtml/00040975.htm
https://www.ncbi.nlm.nih.gov/pubmed/26935205
Pictorial Key to the Adults of Hard Ticks, Family Ixodidae (Ixodida: Ixodoidea), East of the Mississippi River. James E. Keirans and Taina R. Litwak. J. Med. Entomol. 26(5): 435-448 (1989)
Ticks Parasitizing Humans in Georgia and South Carolina, Michael W. Felz, Lance A. Durden, James H. Oliver Jr. The Journal of Parasitology, Vol. 82, No. 3 (June 1996), pp. 505-508

Trash to Treasures: Sustainable **Recycling of Electric Vehicles Batteries**

By: Sherone Lloyd
Student, Fort Valley State University

Introduction:

What would happen if batteries were not recycled properly? The toxic material within batteries can be released into the environment and pose serious threats to human health and the environment. If placed in landfills, the toxic materials can leak into soil, which can, in turn, contaminate water supplies. Consider that according to Clarios: “Materials in vehicle batteries are the most recycled consumer products in the world? Compared to 55% aluminum cans, 45% newspaper, 26% tires and 26% glass bottles, 99% lead is currently recycled.” (2022).

Discussion

The Importance of Battery Recycling: Lithium-ion recycling could help decrease material dependence, increase supply chain security, and lessen the negative effects these batteries have on people and the environment. Recycling also prevents valuable material (resources) from entering the waste stream, A battery's parts may be recycled if it cannot be utilized in a secondary application. Battery specialists and environmentalists suggest multiple reasons to recycle lithium-ion batteries, including material recovery which contributes to manufacturing of new batteries and other sustainable items. Auto recyclers (previously known as junkyards or salvage yards) ship batteries to specialized companies that disassemble the packs and separate them into their many components, including cables, circuits, plastics, and the actual cells, rather than throwing them away. The recycling process for car batteries is not complex and begins with the removal of any materials that are combustible including plastic and insulation before breaking down the actual cells into small pieces. The cells are then heated to liquify the metals within which are poured into molds to create new cells. Next, the battery is shredded until reduced to powder which is then smelted, a process that separates or extracts the metal from its ore or chemically it is dissolved in an acid solution to extract elements that may be reused or sold. What is left is crushed in order to recover any remaining usable materials with the remainder discarded. This process basically reduces the battery to a few small particles as opposed to a complete battery. This process sounds like a wonderful plan, but let’s be clear, EV batteries for vehicles were first introduced between 1996 and 1999. EV car batteries have a life span of 10-20 years; so the first batch of “spent” EV batteries probably have already hit the landfills. The quantity of EV batteries that will be left over as older EVs start to reach the end of their useful lives poses an unexpected future threat. Imagine EV batteries, as well as batteries from smartphones and other electrical gadgets, filling landfills. This new burden on landfill spaces and the surrounding environments can only spell disaster. Additionally, mining the components for EV batteries is already having a significant negative impact on the environment.

An impressive engineering achievement is the Tesla Model S battery pack. To convert lithium and electrons into enough energy to move the automobile over hundreds of kilometers without emitting exhaust emissions, thousands of cylindrical cells made of parts from all over

Continued on Page 33

"Electric Vehicles" Continued From Page 32...

the world are used. However, the battery's environmental advantages disappear once reaches the end of its useful life as the cells could emit harmful pollutants, including heavy metals. When these heavy metals reach a landfill, there is a danger of releasing toxic chemicals in the air and through the water system causing health issues to humans and aquatic life.

The cost, emissions, and fuel efficiency of EVs may all be improved with batteries and appears on the not-so-distant horizon to the be wave of the future. Better Air Quality (AQ), improved health, improved national security, and improved environmental conditions are all social benefits of EVs. Recycling, if either self-imposed or a federal mandate may help minimize the amount of waste going to landfills, which could have positive economic effects. Researchers highlight that improved recycling techniques would not only lessen pollution but would also help governments increase supplies of vital battery metals, which are now controlled by one or a small number of countries, thus enhancing their economies and national security. On the one hand, there is a waste management issue with how to dispose of EV batteries. According to Gavin Harper, a researcher at the University of Birmingham who specializes on EV policy issues, "on the other side, it's an opportunity for producing a sustainable secondary stream of critical materials."

What is an end-of-life EV batteries?

End-of-life batteries are just what they sound like: batteries that have outlived their useful lives and/or have reached the point where they are no longer able to function at a satisfactory level and subsequently must be discarded in favor of a working replacement. The longevity of an EV battery is determined by the vehicle's architecture (e.g., fully electric, or plug-in hybrid) and use (e.g., passenger cars, transit/school buses, heavy-duty trucks). When a battery is discarded, the usable resources that may recovered are lost. Recycling the batteries reduces greenhouse gas emissions as well as air and water pollutants. Additionally, local recycling efforts prevent batteries from being delivered to locations where they could cause a fire hazard in facilities that are not set up to handle them safely. A battery's material composition, or "chemistry," is matched to its intended function. Lithium-ion (Li-ion) batteries are employed in a wide range of applications and environmental conditions. Some batteries are designed to give a small quantity of energy for a long period of time, such as when operating a cellphone, but others must provide a bigger amount of energy for a shorter period, such as when operating a power tool. Li-ion battery chemistry can also be optimized to increase charging cycles or to allow the battery to operate in high or low temperature conditions. Furthermore, technical innovation leads to the usage of new battery chemistries throughout time. Lithium, cobalt,

Continued on Page 34

"Electric Vehicles" Continued From Page 33...

nickel, manganese, and titanium are common elements used in batteries, as well as graphite and flammable electrolytes. Current and future research being conducted looks to develop Li-ion batteries that are less harmful or fit the requirements for new applications.

With about 70-80% initial capacity despite no longer operating at peak-performance, End-of-life EV batteries may provide an excellent secondary source of critical material in the future, sparking a second life application including windmills (backup power), low speed electric bicycles, and streetlights that was powered by old Nissan Leaf batteries and solar energy. The technical requirements for second life are usually less stringent than the first ones. Participating agencies that oversee such things are generally found within Federal and State offices. Several pop-up plants have been noted as expanding from different countries, launching the most comprehensive electric vehicle battery recycling program, with several noted as making their home here in Georgia.

The Future of EV Battery Recycling:

As China, North America, and Europe, the world's three major auto markets, continue their shift to EVs, demand for batteries will rise in the 2020s and '2030s. Furthermore, new mining takes a long time to start up, particularly in nations with strict environmental regulations. The sole purpose of EV recycling is to create sustainable products for the environment to supplement mining of needed elements. The future of transportation involves phasing out combustion engines; industry analysts predict at least 145 million EV will be on the road by 2030. Scientists are attempting to ensure that the batteries used in electric vehicles (EVs) sold today can be recycled in

2030 and beyond, when thousands of batteries will reach the end of their useful lives every day. EV batteries come in a variety of designs, but they all have the same components, much of which can be recycled in the right environment.

The Purpose of Grant Funding:

The purpose of grant funding and increased stewardships for EV batteries is first step towards environmental protection. Education and accessibility are two of the most effective tools to ensure safety, especially as the world phases out the combustible engines in favor of cleaner power sources. Without appropriate knowledge, EV batteries are more likely to be improperly handled, leading to significant safety risks and environmental insult. Li-ion batteries can cause dangerous fires if not handled properly, endangering waste workers, residential communities, and entire recycling facilities. Continuing to streamline guidance on collecting, transporting, and recycling these batteries for both consumers and producers will help decrease safety risks.

The future is only getting more electrified, and the batteries that are at the heart of that revolution are evolving rapidly with the development of new battery chemistries, and sizes. Collaboration within the network of manufactures, auto recyclers, governments, and civil society partners is necessary to stay at the forefront of the battery recycling as a positive environmental action. Grant-based fundings allows consumers to build the necessary facilities to conduct and manufacture sustainable equipment in support of future transportation needs.

Who is funding who?

As automakers and their suppliers transition away from internal combustion engines, the development of a viable electric vehicle (EV) battery recycling sector has progressed from a net-positive sideline to a future requirement for transportation in future decades. The good news is that the newly passed Inflation Reduction Act by the Biden Administration gives incentives for automakers to employ recycled materials in their batteries. Startup companies, including one formed by Tesla's former CTO, are taking on the recycling challenge, and collaborating with automakers. The Biden Administration launched

Continued on Page 35

"Electric Vehicles" Continued From Page 34...

a $74 million funding program to promote domestic battery recycling and reuse, thereby strengthening the nation's battery supply chain and safe-guarding landfills from unnecessary salvage. The Energy Department is one of many that provided over 5.5 million to aid in collecting, storing, and transporting EV batteries, as well as transitioning towards renewable energy production. Michigan Technological University and Eagle Mine are co-recipients of some of these funds, according to Michigan Tech News who reported that $8.1 million will be utilized to demonstrate innovative research technologies for developing sustainable ways for supplying essential minerals for electric vehicle (EV) battery manufacture. For the development and expansion of lithium-ion battery recycling technologies, UC San Diego will receive $10 million. A $6 million grant has been given to Carlsbad's Smartville Inc. to increase battery utilization in energy storage systems. EV batteries recycling funding, stewardships, and grants are being provided throughout different countries. Here in the United States the Department of Energy (DOE) is one of many entities providing funding with over 5.5 billion being awarded to aid in establishing renewable energy production.

Georgia – A Major Player:

Other EV industry firms have recently made moves in the state as well. According to the governor's office, Rivian made the single largest economic investment in Georgia's history last year with plans for a $5 billion EV production facility in East Augusta. Hyundai also began ground last month on a $5.5 billion "mega campus" in Savannah, Georgia, where it would manufacture batteries including a variety of EVs. In the author's own backyard, Covington, GA welcomes Ascends Elements. Under the old name of Battery Resources, the facility, known as "Base 1", commenced partial operations in August, 2023. It then changed its name to Ascend Elements and has the capacity to handle up to 30,000 metric tons of used lithium-ion batteries and manufacturing scrap per year, which is enough to build approximately 70,000 electric vehicle batteries. The recycling process recovers up to 98% of the important battery metals such as nickel, cobalt, manganese, and lithium from spent electric vehicle batteries and scrap. The State of Georgia is steadily becoming a hub for the recycling of EV batteries.

Conclusion

As a "Georgia Peach," this author has witnessed many plants relocated here in their community, including innovations occurring as a result of Georgia hosting a $850M EV battery parts plant (Dive Brief, 2022). Solvay Specialty Polymers intends to construct an $850 million plant in Augusta, Georgia, to produce crucial lithium-ion EV battery components. Polyvinylidene fluoride will be used to make EV battery binders and separator coatings by the polymer firm. Solvay claims that with the new facility, it will have the highest production capacity of the lithium-ion chemical component in North America. The initiative is a collaboration between Solvay and Orbia, a chemical producer that will supply raw ingredients. The firms intend to establish two manufacturing facilities, both of which are scheduled to be operational by 2026, less than two years from now.

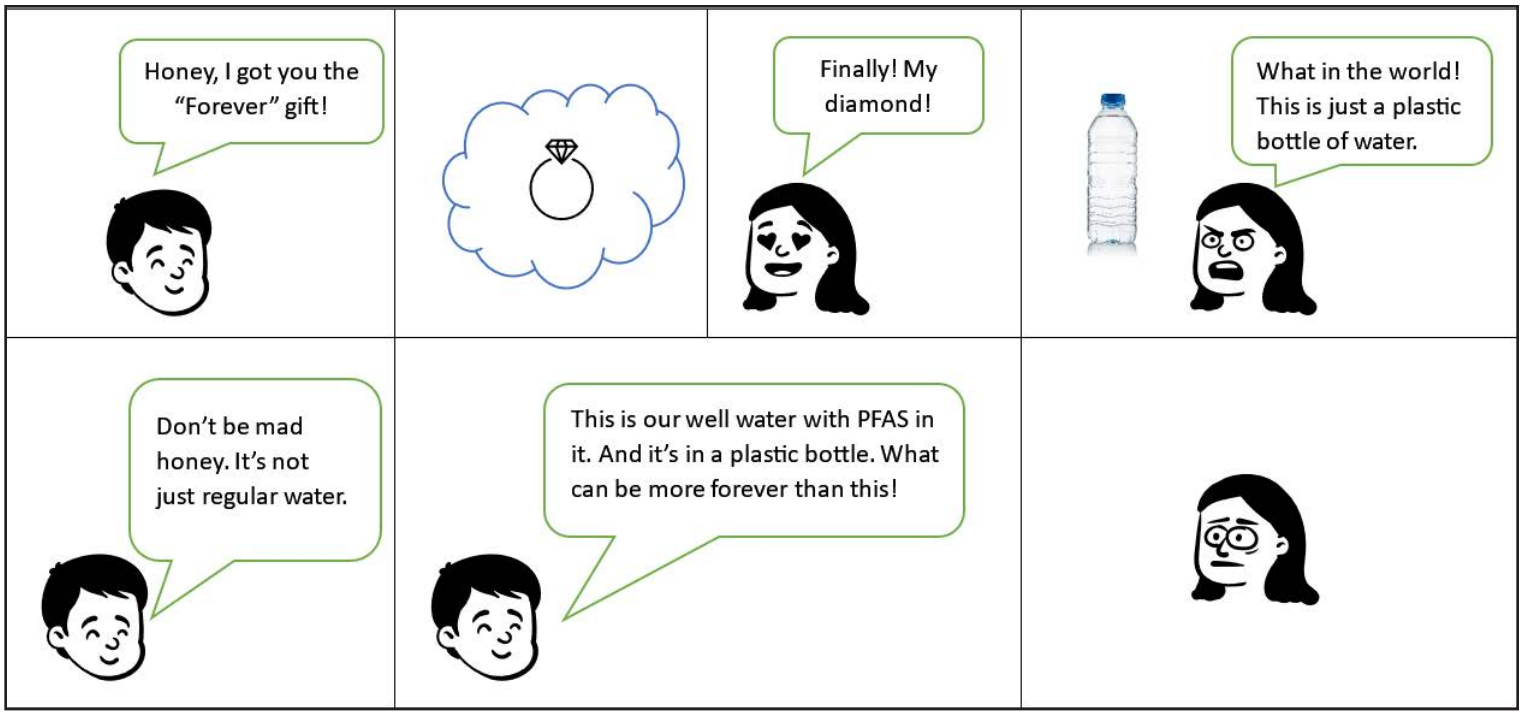
References

Battery policies and Incentives Search. Energy.gov. (n.d.). Retrieved June 15, 2022, from https://www.energy.gov/eere/vehicles/battery-policies-and-incentives-search#/

Battery policies and Incentives Search. Energy.gov. (n.d.). Retrieved June 23, 2022, from https://www.energy.gov/eere/vehicles/battery-policies-and-incentives-search

Battery recycling is important for environmental health. Gallegos Sanitation / Republic Services. (2020, January 20). Retrieved June 17, 2022, from https://gsiwaste.com/battery-recycling-is-important-for-environmental-health/#:~:text=As%20batteries%20corrode%2C%20their%20chemicals,could%20be%20ingesting%20dangerous%20metals.

Recycling my battery: We make it easy! Clarios. We make it easy! | Clarios. (n.d.). Retrieved June 20, 2022, from https://www.recyclingmybattery.com/en-us



Together Forever with PFAS

By: Anita Saha, MS
Environmental Exposure Risk Assessor

PFAS (per- and polyfluoroalkyl substances) are a group of man-made chemicals that have properties that resist heat, grease, and water. The chemistry of PFAS was discovered in the late 1930s. Since the 1950s, PFAS chemicals have been used in many consumer products and industrial processes [ITRC 2022]. PFAS is a strongly bonded, long chain of carbon and fluorine atoms that do not degrade easily in the environment; hence, why they are known as "forever chemicals". Currently, PFAS are classified as an emerging contaminant. An emerging contaminant is a chemical or material characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards [DEEP 2023]. PFAS are not the "new kid in the town", but a contaminant that can be labeled as "emerging" because of the discovery of a new source or a new pathway to humans. Despite their long history of use, scientific studies have shown that PFAS can have adverse impacts on human health and the environment, even at very low levels [ATSDR

Continued on Page 37

Common PFAS: Abbreviations and Names

Abbreviation	Chemical Name
PFOS	Perfluorooctane sulfonic acid
PFBS	Perfluorobutanesulfonic acid
PFOA (aka C8)	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFOSA (aka FOSA)	Perfluorooctane sulfonaminde
MeFOSAA (aka Me-PFOSA-AcOH)	2- (N-Methyl-perfluorooctane sulfonamido) acetic acid
Et-FOSAA (aka Et-PFOSA-AcOH)	2- (N-Ethyl-perfluorooctane sulfonamido acetic acid
GenX (aka HFPO-DA)	Hexafluoropropylene Oxide (HFPO)
PFHxS	Perfluorohexane sulfonic acid

"PFAS" Continued From Page 36...

2020]. Research suggests that high levels of certain PFAS may lead to:
• increased cholesterol levels (PFOA, PFOS, PFNA, PFDA);
• changes in liver enzymes (PFOA, PFOS, PFHxS);
• decreased vaccine response in children (PFOA, PFOS, PFHxS, PFDA);
• increased risk of high blood pressure or pre-eclampsia in pregnant women (PFOA, PFOS);
• small decreases in infant birth weights <20 grams (0.7 ounces) decrease in birth weight per 1 ng/mL increase in PFOA or PFOS in blood).

People exposed to PFAS at high levels may have an increased risk of kidney cancer or testicular cancer. The Environmental Protection Agency (EPA) has classified PFOA and PFOS as having suggestive evidence of carcinogenic potential in humans. The International Agency for Research on Cancer has classified PFOA as possibly carcinogenic (causing cancer) to humans, but it has not evaluated whether other PFAS may also cause cancer [ATSDR 2020].
The PFAS family includes hundreds of chemicals. Structural differences are the basis for different chemical properties and names. The PFAS family tree image shows some of the different families of PFAS [ATSDR 2017]. For simplicity, it does not include all PFAS subfamilies [ATSDR 2017]. The U.S. Environmental Protection Agency (EPA) is proposing to regulate six specific PFAS: PFOS, PFOA, PFHxS, GenX chemicals (also known as HFPO-DA), PFNA, and PFBS [USEPA 2023a]. PFAS are widespread and can be detected in human blood, urine, and even in breast milk [DPH 2022]. However, chemical levels in the human body can decrease as the environmental exposure goes down. People are repeatedly exposed to PFAS chemicals and some PFAS can build up in blood over time.
The main source of exposure to PFAS is ingestion of contaminated food and water. Breathing contaminated air can also be a source; however, this is a likely scenario in occupational settings. Some common sources of PFAS exposures include [ATSDR 2020]:
• nonstick cookware;
• grease-proof packaging;
• stain, water- and flame-resistant products such as upholstery;
• firefighting foam; and
• pesticides.
PFAS do not fully break down in the environment, they continue to 'cycle' through a variety of media including soil, groundwater, surface water, and air. The following image shows how PFAS chemicals can cycle through the environment [DEEP 2023]. PFAS can enter surface water when PFAS-containing wastewater is discharged (intentionally or accidentally) from industrial facilities, landfills,

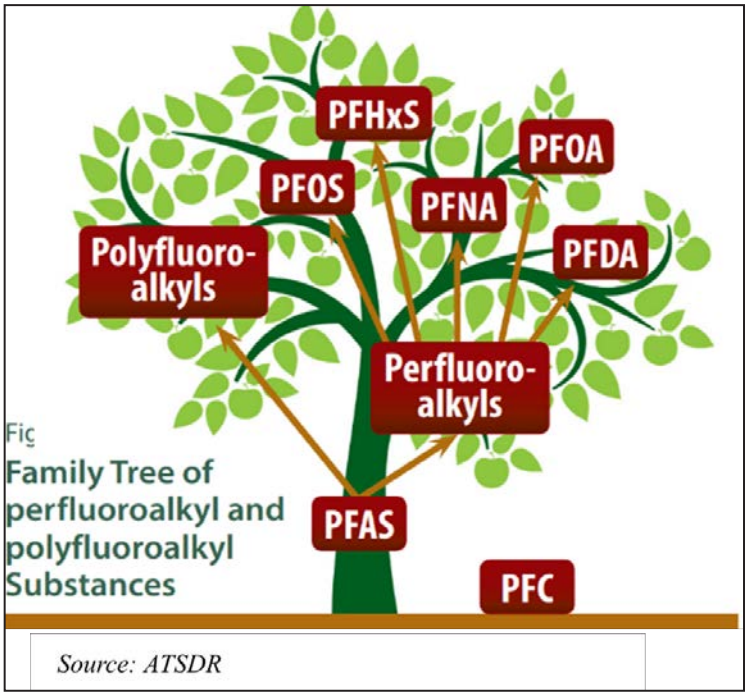


Fig
Family Tree of perfluoroalkyl and polyfluoroalkyl Substances

Source: ATSDR

and wastewater treatment plants. Soil and groundwater contamination can occur in areas that have leaking septic systems or where PFAS-containing fertilizers, such as biosolids, have been applied to gardens and farmlands. The release of PFAS-containing firefighting foam is also a significant source of soil and groundwater contamination. Industrial emissions and solid waste incineration may release PFAS into the air, which can travel long distances before eventually settling back down onto land. Fish exposed to contaminated water and soil can also become contaminated with PFAS [DEEP 2023].
Filters containing activated carbon or reverse osmosis membranes have been shown to be effective at removing PFAS from water supplies. However, water treatment units must be maintained properly to preserve effectiveness.

A study conducted by the Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Health (MDH) found that some faucet mount water filters, which is intended for home use to treat water from a single faucet, can effectively remove nearly all PFAS typically found in County groundwater to below detectable levels and MDH health recommendations [MDH 2017].
Currently, EPA is monitoring thousands of drinking water systems across the country for PFAS chemicals and restricting PFAS discharges by strengthening Clean Water Act Standards. EPA is taking final action on a proposal to designate two PFAS (PFOA and PFOS) as "hazardous substances" to help hold polluters accountable. EPA is proposing to regulate PFOA and PFOS at a level that can be reliably measu-

Continued on Page 38

"PFAS" Continued From Page 37...

red, which is 4 parts per trillion (4.0 nanograms/Liter) [USEPA 2023b]. The proposed rule would also place limits on any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. If finalized, the proposed regulation will require public water systems to monitor for these chemicals. It will also require systems to notify the public and reduce the levels of these PFAS if levels exceed the proposed regulatory standards. EPA anticipates finalizing the rule by the end of 2023.

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 2020. Perfluoroalkyls – ToxFAQs. March 2020. https://www.atsdr.cdc.gov/toxfaqs/tfacts200.pdf.

[ATSDR] Agency for Toxic Substances and Disease Registry. 2017. The family tree of perfluoroalkyl and polyfluoroalkyl substances (PFAS). June 2017. https://www.atsdr.cdc.gov/pfas/docs/PFAS-FamilyTree-Community.pdf.

[DEEP] Department of Energy and Environmental Protection, Connecticut. 2023. Per- and Polyfluoroalkyl Substances (PFAS). June 2023. https://portal.ct.gov/DEEP/Remediation--Site-Clean-Up/Contaminants-of-Emerging-Concern/DEEP-PFAS-Homepage.

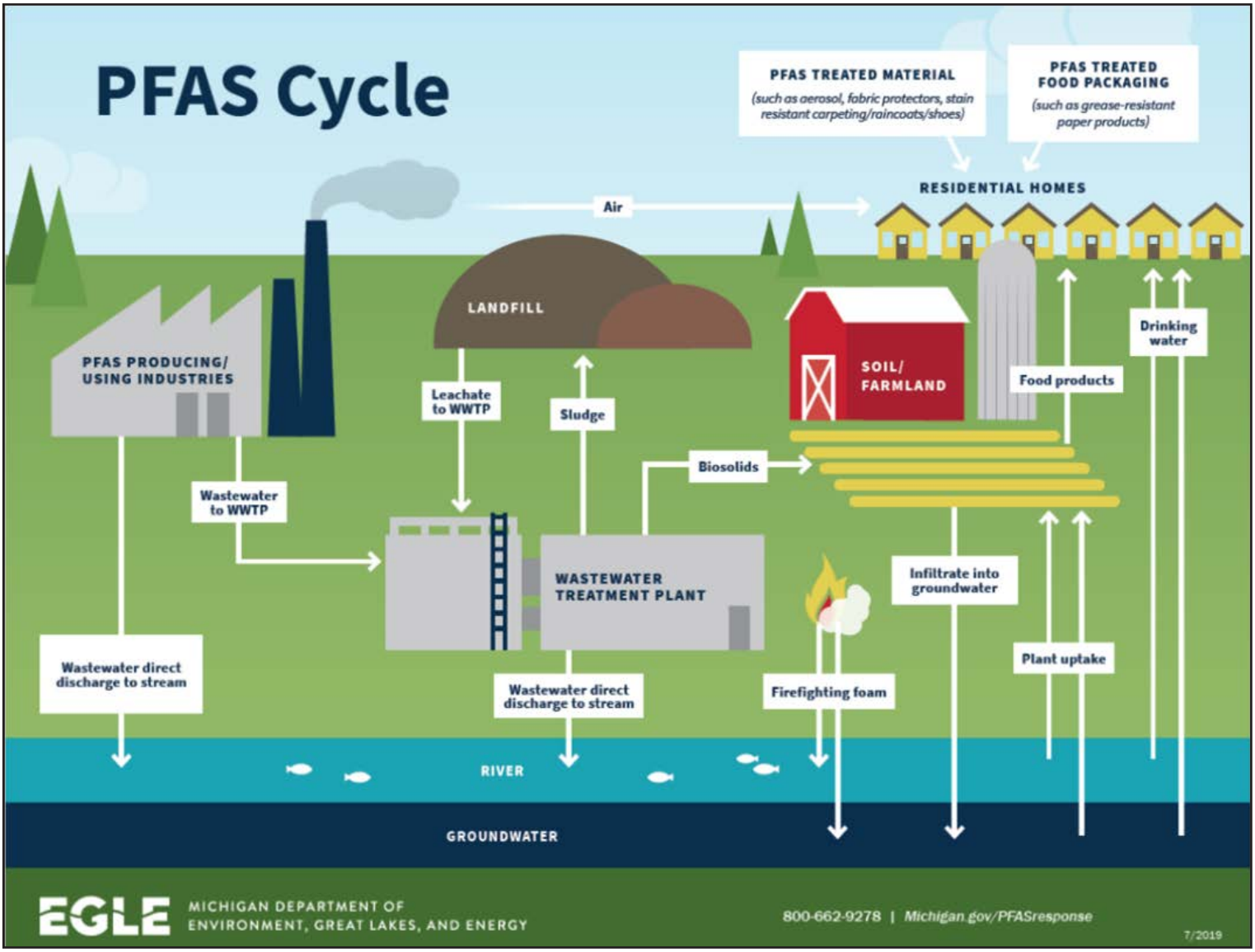
[DPH] Department of Public Health, Georgia. 2022. Frequently Asked Questions, PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS). September 2022. file:///C:/Users/ansaha/Downloads/EnvHealthChemHaz_PFAS_0922%20(1).pdf.

[ITRC] Interstate Technology and Regulatory Council. 2022. Per- and Polyfluoroalkyl Substances Technical and Regulatory Guidance. June 2022. https://pfas-1.itrcweb.org/wp-content/uploads/2022/09/PFAS-Guidance-Document-9-2022.pdf.

[MDH] Minnesota Department of Health. 2017. Evaluation of Perfluorochemical Removal by a Small, In-home Filter. June 2017. https://www.health.state.mn.us/communities/environment/hazardous/docs/pfas/poueval.pdf.

[USEPA] U.S. Environmental Protection Agency. 2023a. Proposed PFAS National Primary Drinking Water Regulation. June 2023. https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas.

[USEPA] U.S. Environmental Protection Agency. 2023b. EPA's Proposal to Limit PFAS in Drinking Water. March 2023. https://www.epa.gov/system/files/documents/2023-04/Fact%20Sheet_PFAS_NPWDR_Final_4.4.23.pdf.



972.713.3700
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Body Art Program Rules Inked At Last

By: Adam Middleton and Maurice Redmond
Body Art Program Consultants

The Georgia Department of Public Health (DPH) Body Art Rules and Regulations, Chapter 511-3-8, are now in indelible ink. The Department hosted three rounds of public hearings in 2022 and 2023, and on March 3, 2023, the rules and regulations were signed by Commissioner Kathleen E. Toomey, M.D., M.P.H. These new rules and regulations take effect statewide on October 6, 2023.

Under the new rules and regulations, the DPH Environmental Health Section will be responsible for certifying all body artists in the state working in studios. Body artists will receive a certification that ties into the procedures they wish to practice. These procedures include tattooing, piercing, and microblading. New and existing artists will be required to take an exam developed by DPH that tests knowledge on the rules and regulations for body art. Upon passing the departmental exam, body artists will fill out an application and include supplemental documentation such as training certificates related to bloodborne pathogens and first aid and cardio-pulmonary resuscitation (CPR).

Industry training or an apprenticeship is not required to obtain a DPH body artist certification. DPH does not require a background check to obtain a body artist certification, however background checks may be required by local city ordinance. A body artist with a valid certification will be eligible to work at any permitted body art studio in the state of Georgia. The certification will also allow an artist to practice at a temporary body art studio that is associated with a body art event or convention that is being hosted by an organizer in Georgia.

Body art studios will continue to be permitted by the local health departments. All existing and new studios will be required to go through an application review process. One area that has been strengthened by the rules is the requirement for studios to have written policies and procedures. These procedures will lay out how the studio operates day-to-day dealing with topics such as sterilization, disinfection of workspaces, and handling of client files.

During the next year, environmental health specialists (EHS) throughout the state will educate existing body art studios through inspections, providing guidance about transitioning to the new rules and regulations. Existing studios will have 12 months, to October 6, 2024, to obtain a new permit. If an imminent health hazard has been identified, owners will be required to remedy the problem before being issued a new body art studio permit. These studio visits will also give the EHS an opportunity to speak and work with studio owners and artists to go over how the new rules and regulations differ from their local rules that were in place previously. During this transition to the new rules and regulations, the body art program will continue to develop tools that will help EHS succeed in conducting body art inspections. Some of these tools include a standardized body art inspection form, applications, and body art studio plan review checklist.

To date, the Body Art program consultant has been able to attend or present at three health district staff meetings throughout the state, at the Georgia Business Tax Officials Annual Conference, and attend the Association of Food and Drug Officials (AFDO) Annual Education Conference. The body art program has also been able to host its first virtual training on the new rules and regulations in June of this year. The training was held over two days and included more than sixty EHS from around the state. The training covered rules and regulations on body art and included a section at the end on how to conduct a body art studio inspection. The program will continue to host trainings throughout the transition period with the goal of training EHS statewide.

Please visit us on our website at www.dph.georgia.gov/environmental-health/body-art or email the Body Art Program at bodyart@dph.ga.gov.

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The Environmental Impact on Emotional Health of Biophilic Spaces

By: Milo Ra'oof
Student, Fort Valley State University

Introduction

Human beings have become more and more disjointed from nature as technology advances our society forward. A lot of people to include the author of this article, feel as though this lack of connection to nature negatively affects within their physical and emotional states of well-being. The buildings that people spend most of their day within are designed in such a way that they do not offer any connection with nature. Biophilia, is the term that best defines our "innate human instinct to connect with nature and other living beings" (Bringing the Outdoors in: The Benefits of Biophilia, 2020). The significance of incorporating biophilia in building design as represented in current research, further supporting the notion that "biophilia is more than just a philosophy. Biophilic design has been found to support cognitive function, physical health, and psychological well-being" (Bringing the Outdoors in: The Benefits of Biophilia, 2020) To achieve this reconnection with nature within the spaces that we occupy, it is important to look at the current state of building design.

Building design is definable by its six basic categories: environmental features, natural shapes and forms, natural patterns, and processes, light and space, place-based relationships, and evolved human-nature relationships. Its use is to promote health and emotional well-being. There are notable building's that exist in the authors hometown of Georgia that have been successful at implementing a biophilic building design. They are: Kendeda (Georgia Institute of Technology), Bonsai Architectural Designs (Atlanta, Georgia), and The Phipps Plaza (Atlanta, Georgia). The research was conducted on the Kendeda AKA K-1 Building on Georgia Tech's campus and its effect environmentally on the emotional health of patrons within the building.

The objective of the research was to observe the impact that the K-1 building has on student happiness and compare his findings to other buildings on Georgia Tech's campus that are non-biophilic in their buildings design. Observing happiness is no easy task and certainly was not the original plan of the author. Barriers were encountered during the research in gaining access for sending survey to students for self-assessment of the building's design and their happiness when in the building. While that would provide the most robust research findings,. the design was changed due to being denied access to student emails for survey use. Instead, the researcher, himself observed the students while they were in the building. Silent observations of students as they interacted with the building were made three times a week, twice daily over the course of three consecutive semesters (Summer 2022, Fall 2022 and Spring 2023). This amounted to approximately 288 individual observations over a period of nine months. His proposed conclusion for his revised research was that he would observe, but not be able to confirm that students would be happier in the K-1 building design versus other buildings on Georgia Tech's campus. In support of current research in the field of biophilic building design and improved health overall, He believes that this should be extended into the

Continued on Page 43

"Biophilic Spaces" Continued From Page 42...

university setting. His primary reason is that university students are often extremely stressed and can benefit from incorporating biophilia in the spaces they occupy on campus to study, work, etc. He can account for reports of many students on campus committing suicide and hurting themselves because of extreme stress to attain a prestigious degree from the Georgia Tech. He strongly feels that this is a resolvable problem and that providing these students access to buildings with a biophilic design can help to minimize the stress they encounter whilst attaining their degree.

Discussion

The impact that The Biophilic Building Design has the potential to affect a person's emotional and physical health is vital in the future. To add to current research in support of this "Biophilic design within the built environment has been found to promote a sense of place; yet studies are lacking in how nature-based design is conducted on college campuses" (DeLauer et al., 2022) Similarly, " A biophilic design may include a visual (view of trees) or non-visual connection (sound of wind) to nature while indoors, fresh air or natural lighting within a classroom building, material connection through the use of wood construction, and feelings of prospect, refuge, and mystery within four walls" (DeLauer et al., 2022) This specifically provides evidence that biophilic building design can improve the mood of students in a university setting and is essential to their learning environment.

The K-1 Building on Georgia Tech's campus is a strong example for future biophilic building designs. K-1 adheres to the Living Building Challenge with one of its core petals (Health and Happiness) to include Biophilia. The student's experience, in regard to, the effects of biophilic building design incorporations on their health and emotional well-being is best understood through personal accounts rather than observations in the author's point of view. Regardless, he was able to complete his research in the form of observations and make some conclusions to support his strong beliefs that biophilic building design can be implemented to improve student mood and health.

The observation of Georgia Tech students in K-1 against other non-biophilic building designs on Georgia Tech's campus were done over the course of a year, three times a week and twice daily via a 30 question Survey Monkey survey that he designed himself based on K-1's Health and Happiness Petal. A few significant questions that provided support for the research to build more spaces with a biophilic building design included: The observance of Georgia Tech students in K-1 or a building with a similar biophilic design, strong biophilic design elements were present in the building(s), and students' happiness was noticeably higher in these buildings.

Specifically, the observations indicated a positive correlation with students being happier, but not necessarily able to often recognize the biophilic elements of a building's design strongly represented in K-1 and other buildings on campus. In essence, they feel better but do not necessarily know why or attribute it to the biophilic building design. The findings were consistent across all semesters and times collected each week. The only exception: students were better able to recognize the biophilic elements during guided tours of K-1 specifically while being observed. Most of the time students did not often read literature on the walls illustrating the biophilic design elements, interact with building features that are biophilic, or ask questions from the building staff about its biophilic elements unless on a guided tour.

This study serves as a basis for future biophilic building designs like K-1 to be implemented to improve student happiness promoting a less stressful environment for them to learn and work in. It also is a positive contribution to the existing literature on the topic of biophilic design effects.

Conclusion

Future biophilic building designs should invest in creating spaces that are more easily recognizable for students. Also, Georgia Tech and its faculty could be more supportive to facilitating collaborative research on this topic and showcasing the buildings among students as a place to come for relaxation and use.

The research confirms that in the field of biophilic building design that students can benefit from such a building design and in the future minimize extreme stress leading to healthier and happier students contributing greatly to society.

This research introduced the need for such building design and the benefits that may be achieved through a poster presentation at the GEHA Annual Education Conference in 2022, a presentation at the Science Art Wonder (SAW) Program at Ga Tech, and as a participant at various Art/Science Events throughout Atlanta, Ga. during 2023.

References:

Bringing the Outdoors In: The Benefits of Biophilia. (2020, June 23). Retrieved from: https://www.nrdc.org/bio/maria-mccain/bringing-outdoors-benefits-biophilia

DeLauer, V., McGill-O'Rourke, A., Hayes, T. L., Haluch, A., Gordon, C., Crane, J. G., Kossakowski, D., Dillon, C., Thibeault, N., & Schofield, D. (2022). The impact of natural environments and biophilic design as supportive and nurturing spaces on a residential college campus. Cogent Social Sciences, 8(1). https://doi.org/10.1080/23311886.2021.2000570

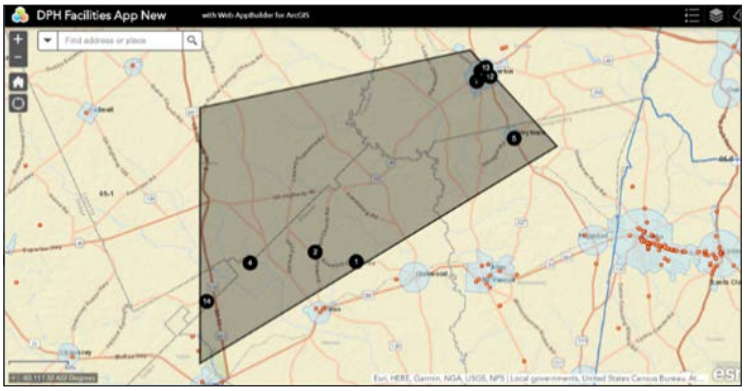
Restaurants Reopening Quickly After Disaster Make More Resilient Communities

By: Byron Lobsinger
Environmental Health Emergency Planner

Restaurants reopening quickly after an emergency or disaster make more resilient communities. Nearly every week, somewhere in Georgia, there are food service establishments that have no power or experience a water interruption that may include a boil water advisory or notice, a do not drink or use notice, or no water at all. The State Environmental Health (EH) Office has developed two methods for communicating with permitted facilities. The Facilities App use geographic information system (GIS) tools to identify EH permitted facilities within an incident area. Once identified, the app allows the EH staff to download a file of the affected facilities for either an in-person visit or a phone call for follow-up. The other communication tool used by EH is ReadyOp which can be used to identify facilities by health district, city, zip code, water utilities, or EH inspection area to send messages via phone, text, or email. This has been very helpful prior to a known event such as a hurricane or planned water outage due to repair work. During an emergency, food service facilities may continue to operate if they have an approved emergency operations plan in place which they follow. Communities depend on restaurants to provide safe, wholesome food every day as well as after a disaster. Having an emergency operations plan in place is good for business, good for employees, and good for the entire community, especially during disaster recovery operations. Georgia's business-friendly environment encourages restaurants to have emergency operations plans to help create more resilient communities.

Food service emergency operations plans may vary depending on the complexities of the establishment's operational needs. Guidance is provided by local environmental health offices and the Department of Public Health (DPH), Environmental Health Section. Guidance documents include planning for a water interruption and assessing emergency operations plans. Emergency food service operations plans may include such measures as accessing an alternate approved water source, implementing a limited menu, and using disposable utensils and paper plates.

Disasters can occur anywhere in Georgia and may include tornadoes, hurricanes, flooding, train derailments, radiation fall-out or other natural



or man-made events. Planning is a challenge because you never know what will be damaged or where injuries and fatalities may occur. The most critical part of planning is the development of partnerships prior to a disaster and knowing who to call during disaster recovery. A food service facility with an emergency operations plan enables the business and community to recover both economically as well as socially after a disaster. Tools and responses continue to improve as lessons-learned and after-action reports are incorporated into the planning process for the next disaster recovery response.

The National Restaurant Association estimates that the average American ate out at least five times a week in 2016, and 47% of every dollar spent on food was spent in a restaurant (Bartsch et al, 2018). As an example, the impact in Savannah from hurricane Dorian was substantial; lodging, food and beverage, retail, recreation and transportation revenue were all impacted. The initial losses from overnight visitors were $23,141,759 and day tripper losses were $11,445,211. The estimated local tax revenue loss from hotel/motel tax was $1,515,812 (Nussbaum, 2019). The financial impact that the food and tourism industry have on economic recovery is considerable after a hurricane, not to mention the social impact of helping the community rebound.

After a disaster strikes, power and water outages are everywhere, and environmental health concerns are plenty, including the need for safe emergency shelters, safe food, and potable water for the public. EH performs shelter inspections for proper sanitation to ensure they remain a safe place for displaced individuals. EH inspects mass feeding sites to prevent foodborne disease transmission. As needs expand beyond local EH capabilities, the affected jurisdiction may

Continued on Page 45

"Reopening" Continued From Page 44...

request support from environmental health specialists (EHS) throughout the state through the Georgia Environmental Health Strike Team program. This program coordinates EHS from around the state to assist with response and recovery operations after a disaster strikes. These rostered, trained, and credentialed team members may be activated to deploy and assist the affected area. The primary mission over the last several deployments has been to support the safe reopening of restaurants as power and water are restored. EH Strike Team support for reopening restaurants enhance the community's socioeconomic recovery. Other response activities may include vector surveillance and control, shelter inspections, well water sampling for testing, mass feeding site inspections, septic system consultations, and Disaster Relief Center support. The costs to deploy the EH Strike Teams within the state for a week are minimal (under $11K) compared to the potential cost of a foodborne outbreak at a restaurant. A single foodborne outbreak in a restaurant can range from (Bartsch et al, 2018):

- Fast-food restaurant - $3,968 to $1.9 million
- Fast-casual restaurant - $6,330 to $2.1 million
- Casual-dining restaurant - $8030 to $2.2 million
- Fine-dining restaurant - $8273 to $2.6 million

With the support of the EH strike team, most restaurants that could open were reopened within a week after power and water were restored to their area. Reopening inspections are an addendum to the existing inspection report with a risk-based educational guidance approach. Inspectors are looking for proper holding and cooking temperatures, food storage and handling, while providing guidance on what foods to discard due to power outages and flooding. The local jurisdiction incurs the travel costs associated with the in-state deployment, which may be added to the disaster area recovery costs for potential FEMA disaster reimbursement support.

Responding to a disaster is a stressful time for both the industry and public health. DPH EH stands ready to support all local EH programs with tools, training, and deployment of EH strike teams to enhance the community's return to social and economic normalcy.

To access the Water interruption brochure and the Guidance document for assessing emergency operations plans, visit the DPH website.

References:

(Bartsch, S.M., Asti, L., Nyathi, S., Spiker, M.L. & Lee, B.Y. (2018). Estimated cost to a restaurant of a foodborne illness. Public Health Reports, 133(3), 274-276. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5958383/

(Nussbaum, K. (2019, September 7) Savannah businesses, hospitality industry ready to welcome customers after Dorian. Savannah Morning News. https://www.savannahnow.com/news/20190907/savannah-businesses-hospitality-industry-ready-to-welcome-customers-after-dorian

Handwash Violations in Georgia Food Sales Establishments:

Automatic vs. Traditional Handwash Sinks

By: Amy Hoover
Metro District Manager, Georgia Department of Agriculture

Background

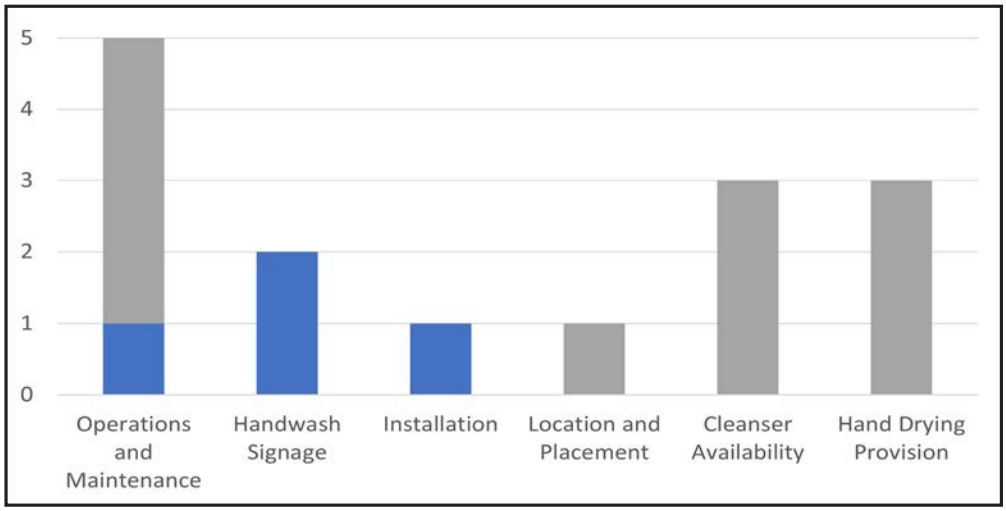
Handwashing is essential in Food Sales Establishments to minimize the spread of foodborne illnesses via hands. The state of Georgia allows the usage of automatic handwash sinks with motion sensors in Retail Food Sales Establishments. They differ from traditional handwash sinks in the sense that they are triggered by motion sensors, as opposed to manually releasing a lever to access a steady stream of water for handwashing. Limited research is available concerning how the handwashing violations between automatic handwash sinks and traditional handwash sinks compare. The Georgia Department of Agriculture's regulations allow for both traditional handwash sinks, along with automatic handwash sinks to be used in regulated facilities in Georgia.

Problem Statement

The functionality of automatic handwash sinks in comparison to traditional handwash sinks leading to handwash violations within Georgia Food Sales Establishments is unknown.

Research Questions

1. What are the handwash violations observed by inspectors within retail food sales establishments that result from, and are related to traditional handwash sinks?
2. What are the handwash violations observed by inspectors within retail food sales establishments that result from and are related to automatic handwash sinks?



Graph 1: Handwash Violations Cited
(Automatic Handwash Sink- Blue; Traditional Handwash Sink- Gray)

3. How do handwash violations within retail food sales establishments using traditional handwash sinks compare to handwash violations within retail food sales establishments using automatic handwash sinks?
4. How do GDA inspectors view traditional handwash sinks and automatic handwash sinks at the firms they regulate?
5. How does the level of food safety risk associated with handwash violations in retail food sales establishments using traditional handwash sinks compare to the level of food safety risk associated with handwash violations in establishments using automatic sinks?

Methodology

This study utilized two surveys, which were sent out to Retail Food Compliance Specialists at the Georgia Department of Agriculture. The first survey sent out was intended to determine which Food Sales Establishments have automatic handwash sinks. This information was used to flag facilities that have automatic handwash sinks. Inspection reports were identified, along with inspection reports from an equal number of similar type firms utilizing traditional handwash sinks to compare violations between the two sets of data for January 2019 through December 2022. The firms that were analyzed included convenience stores with food service components, grocery stores with food service components, and food sales areas with food service components.

When reviewing these inspection reports, the following were examined: the handwash violations that result from and are directly related to traditional handwash sinks, the handwash violations that result from and are directly related to automatic handwash sinks, and how handwash violations within retail food sales establishments using traditional handwash sinks compare to handwash violations within retail food

Continued on Page 47

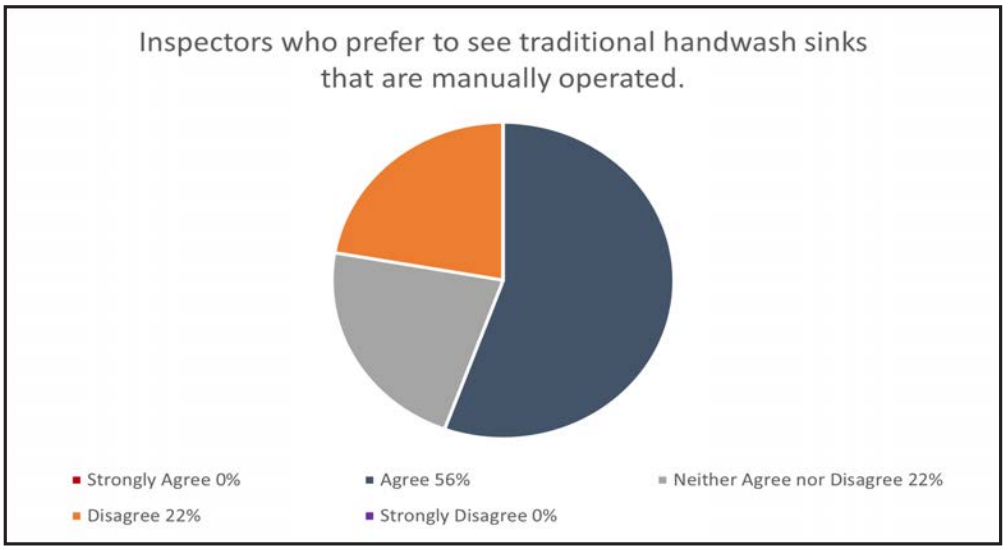
"Handwashing" Continued From Page 46...

sales establishments using automatic handwash sinks.

The second survey which was sent out was meant to collect qualitative data from GDA inspectors. GDA inspectors were asked to rank a variety of questions concerning their opinions of handwashing sinks on a scale from Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly Disagree.

Results

GDA regulates just over 20,000 retail food sales establishments. From the first survey, 287 surveys were received from inspectors. Of these surveys collected, 12 indicated that a firm that had a food preparation component utilized automatic handwash sinks. These 12 represented 4.18% of all surveys received. These firms included four convenience stores with a food preparation component, and eight grocery stores/markets with a food preparation component. The handwash violations at these firms were compared with a random selection of firms with the same type of operations that used traditional handwash sinks from January 1, 2019, through December 31, 2022. Firms from the group with automatic handwash sinks reflected four handwash violations, including one citation for Using a Handwash Sink- Operations and Maintenance (40-7-1-.26(15)), one citation for Handwashing Sinks - Installation (40-7-1-.26(3)), and two citations for Handwashing Signage (40-7-1-.32(5)). Firms from the group with traditional handwash sinks reflected 11 handwash violations, including one citation for Handwashing Sinks - Locations and Placement (40-7-1-.26(7)), four citations for Using a Handwash Sink- Operations and Maintenance (40-7-1-26(15)) , three citations for Handwashing Cleanser Availability (40-7-1-.32(2)), and three citations for Hand Drying Provision (40-7-1-.32(3)). Graph 1 shows the frequency these violations occurred in both firms with automatic handwash sinks and firms with traditional handwash sinks.



Graph 2: Handwash Sink Preference

From the second survey, 18 surveys were received back out of a potential 34 from GDA field inspectors concerning their opinion on these two types of sinks. The survey revealed the following: When responding to the statement "I prefer to see traditional handwash sinks that are manually operated at firms I regulate," 0% stated Strongly Agree, 56% stated Agree, 22% stated Neither Agree nor Disagree, 22% stated Disagree, and 0% stated Strongly Disagree. Graph 2 shows a pie chart on how inspectors responded to the statement "I prefer to see traditional handwash sinks that are manually operated".

Conclusions

From the sample set acquired from the survey meant to establish types of firms, the only common violations noted were Using a Handwash Sink- Operations and Maintenance. The group with automatic handwash sinks also had citations for Handwashing Sinks-Installation and Handwashing Signage. The group with traditional handwash sinks had the addition of Handwashing Sinks-Location and Placement , Handwashing Cleanser Availability, and Hand Drying Provisions in addition to the shared violations. The surveys indicated that more violations were observed at traditional handwash sinks than automatic handwash sinks, however due to the limited sample size this is difficult to determine accurately.

From the information received from the survey sent to inspectors regarding their opinions on handwashing sink types, the majority of inspectors believe that automatic handwash sinks were more likely to have more violations and that a majority preferred to see traditional handwash sinks in the firms they regulate.

Recommendations

Based on the results and conclusions of the research, recommendations include:

- Additional research on the number of traditional handwash sinks in use and the handwash violations associated with them.
- Additional research on the number of automatic handwash sinks in use and the handwash violations associated with them.
- Additional research on if the level of risk associated with automatic handwash sinks versus traditional handwash sinks is significantly different.
- A more focused scientific study to be undertaken which observes employee practices in establishments with automatic handwash sinks.

Clean Water for Georgia Kids™ – A Free **Program to Identify and Eliminate Lead at the** Tap Where Georgia Children Learn and Play

By: Christa Bethelmy
Project Management Specialist, The Clean Water for Georgia Kids Team

Clean Water for Georgia Kids

About the Program

The State of Georgia is committed to addressing lead in drinking water in schools and the overall reduction of childhood lead exposure across the state. This is why, in 2018, Governor Brian Kemp supported the voluntary initiative to test schools using the Environmental Protection Agency's 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities. With funding appropriated under section 1464(d) of the Safe Drinking Water Act, amended by the Water Infrastructure Improvement Act (WIIN) section 2107, Georgia received funding to provide free lead testing across the state.

The Clean Water for Georgia Kids Program™ is a partnership between the Georgia Department of Education (GaDOE), Georgia Department of Early Care and Learning (DECAL), and RTI International, a nonprofit research institute. The program itself is modeled after RTI's award-winning program in North Carolina, named Clean Water for Carolina Kids, which is similarly designed to help public schools and licensed child care facilities test every drinking and cooking tap using an online portal and training paired with a mail-out sample kit, followed by result-specific no-cost and low-cost recommendations to mitigate lead in drinking and cooking water when it is identified.

Our participatory science approach briefly trains staff on how to enroll, collect, and ship water samples, and with program support, empowers staff to eliminate lead exposure at the tap where children learn and play. Using a community-based approach to testing and fixing lead in drinking water ensures that child care administrators, staff, and parents understand the problem and can help take collective action to improve the likelihood of clean water for kids now and in the future. We work with teachers, small groups of students, and parents. In addition to facility reports, the results are also available online on our public mapper for each participating facility, along with the overall program summary.

Lead Exposure and Children's Health

This program is ongoing in Georgia because of the effects of lead exposure on children's health and the occurrence of lead in water infrastructure across the U.S. Lead enters the bloodstream when a person is exposed from drinking water or another source. Some lead is then stored in organs and muscles, where it can cause serious health effects. The nervous system, including the brain, is the most sensitive to lead. Children are more vulnerable to the health effects of lead than adults because their bodies easily absorb lead, and their organs and systems are still developing. Children also are typically exposed to a higher proportion of lead for their body weight. Childhood exposure to lead causes lifelong and irreversible cognitive and behavioral deficits (see Figure 1). Any level of lead exposure causes reduced IQ and associated issues with lear-

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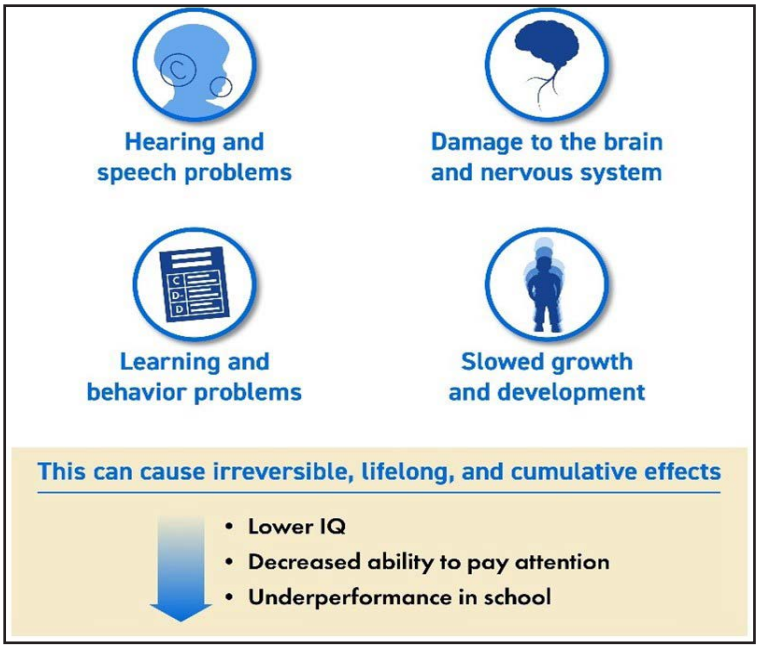

Figure 1. Children's health effects © RTI International 2023 All rights reserved.

"Clean Water for Kids" Continued From Page 48...

ning, school performance, and behavior in children.

Lead Occurrence

Lead is present in tap water from water infrastructure that contains lead, including piping, plumbing, fixtures, or solder, particularly if the water is corrosive or is not used frequently. Lead was used for many years as the main component in service lines, which is a pipe that connects homes and buildings to the main water line coming from water utilities or private wells (see Figure 2). Even new buildings can have lead in drinking and cooking water from internal faucet fixtures or plumbing, or because they are connected to older water infrastructure. From January 2018 to December 2020, 186 million people in the United States—56% of the country's population—drank water from drinking water systems detecting lead levels exceeding the level of 1 part per billion (ppb) (Fedinick, 2021). The U.S. Environmental Protection Agency (EPA) estimates that drinking water accounts for up to 20% or more of a person's total exposure to lead. Formula-fed infants can receive 40% - 60% of their exposure to lead from drinking water (US Environmental Protection Agency, 2023). Individuals drinking the majority of their water from a tap that contains lead may exceed these estimates, such as children that drink from the same child care center faucet five days a week for most of their waking hours.

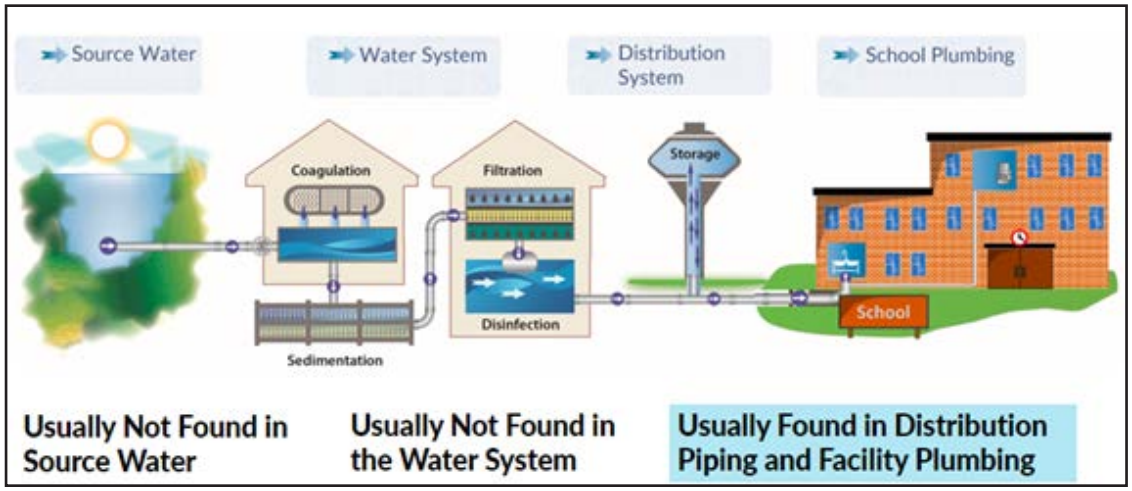

Figure 2. Occurrence of lead in water infrastructure © RTI International 2023 All rights reserved.

Regulatory History

A variety of federal actions have been taken to address lead in tap water since 1988 (see Figure 3). Regulations focused on limiting the allowable lead in water infrastructure: Regulations have changed over time to decrease the allowable amount of lead in these materials, but some lead is still allowed, and older materials are still in use. Although regulations reduced the amount of allowable lead in 1988 (when the first lead restrictions went into effect) and 2014 (when the second lead restriction in water infrastructure went into effect), water infrastructure is still allowed to contain 0.25% lead in piping and plumbing and 0.2% in solder to be considered lead-free. Additionally, lead-lined water fountains were banned from schools in 1990.

Health-based guidance: While there is still no federally enforceable health-based regulation for lead in tap water, EPA set a maximum contaminant level goal (MCLG) of 0 parts per billion for lead in tap water in 1991 because there is no safe level of lead exposure. In 2016, the American Academy of Pediatrics issues a reference level of 1 ppb (ppb) for children's health.

Testing requirements: The federal Lead and Copper Rule requires public utilities to test a small number of households within their public water supply for lead and make system-wide modifications if a certain percentage of households are at or above a 15 ppb treatment-based action level (note that this is health based). Moving forward, the revised Lead and Copper Rule will also require utilities to test a subset of taps at schools and child care facilities. Before the required testing goes into place, our free program is able to identify lead and provide support to address it so that facilities are in compliance when this new rule goes into effect.

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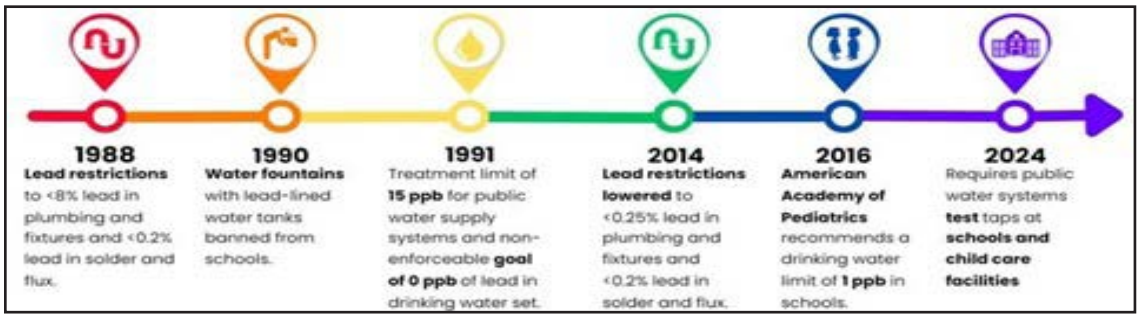

Figure 3. A timeline of lead in water regulations, restrictions, and recommendations © RTI International 2023 All rights reserved.

"Clean Water for Kids" Continued From Page 49..

Testing in North Carolina

A 2017 community-based pilot study in North Carolina, led by RTI International and the Clean Water for Carolina Kids™ program, found that in 63% of child care centers tested, lead was present in water at levels above the American Academy of Pediatrics reference level (1 ppb). The pilot study, which enrolled more than 100 child care centers, showed that lead is commonly found in childcare centers and importantly that when it is identified, there are specific no-cost and low-cost solutions to stop exposure to lead at the tap. Since that time, the statewide Clean Water for Carolina Kids program has tested the water in more than 4,500 operating licensed child care centers and found that 9% had lead at or above 15 ppb in at least one tap. Through participation in our program, specific mitigation actions were completed that allowed centers to stay operational while keeping kids safe. Several factors, such as reliance on well water, building age, and Head Start programs were significantly associated with higher lead risk. Head Start programs were more than two times as likely to have at least one sample above 10 ppb and served a higher percentage of children of color and a higher percentage of children with free and reduced lunch (Hoponick Redmon et al., 2022).

For more information, check out the program summary page, https://www.cleanwaterforcarolinakids.org/programsummary.

Testing to date in Georgia

Following in the footsteps of its sister program, the Clean Water for Georgia Kids has tested over 4,102 drinking and cooking taps at schools and child care facilities in Georgia since 2021. About 1 in every 16 taps across the state have lead levels exceeding Georgia's action level for lead in drinking water (15 ppb), while 1 in every 3 facilities have at least one tap with lead levels exceeding the action level. Additionally, most facilities only have one out of many drinking and cooking taps with detectable lead, illustrating the importance of testing all drinking and cooking taps, and showing that mitigation can be as simple as redesignating a tap as handwash only. Regardless of the building's age, the only way to identify and get the lead out of water is to test for it at every tap used for drinking and cooking. Refer to our program summary for the most up to date information on testing in Georgia, https://www.cleanwaterforuskids.org/georgia/programsummary.

More information about the program testing design

This program is different from the testing usually done by public water systems in several important respects, including the training, testing design, number of sample locations, sample volume, and laboratory analysis.

Training participatory scientists. The virtual pre-enrollment webinar training is less than an hour for a designated staff person. Trained facility staff collect first draw water samples after the mail-out sample kit arrives, which takes about 1-3 minutes per tap. This is a key difference from utility testing, which typically conducts random daytime sampling. The goal of 3T testing is to identify the lead at the tap in the morning when the first child gets to school and takes a drink of water after the water has been sitting overnight. Results are provided directly to participants with recommendations.

EPA 3T method. The water testing done through the Clean Water for Georgia Kids program is based on the EPA's guidance specifically designed for schools (3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities). The program uses EPA's 3Ts guidance as a model to: (1) Communicate, throughout the results and important lead information to the public, parents, teachers, and larger community; (2) Train on the risks of lead in drinking water and testing for lead; (3) Test using appropriate testing protocols and a certified laboratory; and (4) Take Action, including a plan for responding to results of testing conducted and addressing potential elevated lead where necessary. The goal of the Clean Water for Georgia Kids program is to detect specific taps that contain lead and provide recommendations for action to eliminate exposure to lead in drinking and cooking water. The lead testing usually done by a public water system is intended to evaluate the water system overall.

Sample locations. Public water systems are only required to test a very small selection of taps across the water system. We recommend testing all drinking and cooking taps for lead at schools and child care programs, because lead levels can vary from tap to tap, even within the same building.

Sample volume and laboratory analysis. Public water systems collect 4 times more water during lead sampling than the EPA's recommendations for lead sampling in schools and child care facilities. The Clean Water for Georgia Kids program follows the EPA's 3T guidance and collects samples in 250 milliliter HDPE bottles. This is important when trying to find specific taps in a building that may have a lead problem, because a bigger volume will mix water from a longer section of the pipes, making it difficult to know from where the lead is. Additionally, our method is to identify lead down to 0.1 parts per billion – 50 times lower than most utilities and labs.

No-cost and low-cost solutions

When lead is detected at the tap, we can identify which taps to not use for drinking and cooking and stop

Continued on Page 51

"Clean Water for Kids" Continued From Page 50...

exposure immediately. Short-term and long-term changes are available to get the lead out of water. Often, no-cost and low-cost solutions are effective at reducing exposure to lead, such as practicing clean water habits (e.g., using cold water for drinking or cooking), flushing water after periods of inactivity, installing water filters certified to remove lead, and replacing faucet fixtures (see Figure 4).

Lead exposure is preventable; with free testing and support available, Georgia schools and centers can identify and eliminate lead in water today and, in turn, increase the collective potential of students tomorrow and beyond.

Participant quotes

"It's a blessing and everyone should take advantage of it…For the peace of mind and know where you need to make the changes…It's our kids." – Program participant

"Kudos and thanks for doing this important program and making it available" – Program Participant

Show your support

The Clean Water for Georgia Kids mission is to identify and eliminate lead in water where children learn and play. By spreading the word about the importance of identifying sources of lead exposure and removing lead in water in Georgia, we can help protect children's health together across Georgia.

Figure 4. No-cost to low-cost solutions © RTI International 2023 All rights reserved.

Sign the pledge today to show your support for lead in water testing at schools and child care programs in Georgia and help spread the word about our free program at go.rti.org/georgia-water-pledge.

Resources

For more information about the Georgia program or to participate in the pre-enrollment webinar, please visit http://www.cleanwaterforuskids.org/georgia

To see participating facility results, check out https://www.cleanwaterforuskids.org/georgia/data

To see our program summary, check out https://www.cleanwaterforuskids.org/georgia/programsummary

Contact us on our website at https://www.cleanwaterforuskids.org/georgia/contact

Citations

Fedinick, K. P. (2021). Millions served by water systems detecting lead. Be a Force for the Future. https://www.nrdc.org/resources/millions-served-water-systems-detecting-lead

Mulhern, R. E., Kondash, A., Norman, E., Johnson, J., Levine, K., et al (2023). Improved decision making for water lead testing in U.S. child care facilities using machine-learned Bayesian Networks. Environmental Science & Technology. https://doi.org/10.1021/acs.est.2c07477

Hoponick Redmon, J., Kondash, A. J., Norman, E., Johnson, J., Levine, K., McWilliams, A., et al. (2022). Lead Levels in Tap Water at Licensed North Carolina Child Care Facilities, 2020–2021. American Journal of Public Health, 112(S7), S695-S705. https://doi.org/10.2105/AJPH.2022.307003

Hoponick Redmon, J., Levine, K. E., Aceituno, A. M., Litzenberger, K., & Gibson, J. M. (2020). Lead in drinking water at North Carolina childcare centers: Piloting a citizen science-based testing strategy. Environmental Research, 183, 109126. [109126]. https://doi.org/10.1016/j.envres.2020.109126

US Environmental Protection Agency. (2023). Basic information about lead in drinking water. Ground Water and Drinking Water. https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water#health

Clean Water for Georgia Kids

Fish Anyone...A Case Study

By: Samples, OM,
Stose, L, Dykes, G
Fort Valley State University

As part of a recent beta-research activity at Fort Valley State University, Department of Veterinary Science and Public Health, a bass (Micropterus salmoides) was caught in one of the stocked University ponds.

Introduction

Fishing is an outdoors activity enjoyed by many Georgians both as a hobby and a way of securing a tasty meal. However, with all wild meats, both land and water-based, the rewards are not without risks. As part of a recent beta-research activity at Fort Valley State University, Department of Veterinary Science and Public Health, a bass (Micropterus salmoides) was caught in one of the stocked University ponds. The fish did not appear to be thrifty and was humanely killed and preserved on ice for submission to the Tifton Veterinary Diagnostic Laboratory for necropsy.

Discussion

The necropsy of the bass revealed several interesting findings of public health importance. Initially, the fish was found to be infected with trematodes or “flukes”, suspected of being of the Schistosoma species, a zoonotic parasite. Fish have been recognized as having the potential for reducing the zoonotic transmission of this parasite to humans by themselves preying on snails which harbor the parasite as a host. Humans often may be infected by such trematodes because of improperly cooked or raw meat ingestion. Symptoms of such incidents are often manifested as allergic or gastrointestinal illnesses.

Bacterial cultures of the gills demonstrated eight different isolates of which four (50%) were considered zoonotic and capable of human infection (See Table 1). Most pathogens that may be transmitted from fish to humans fall into the bacterial class, although some parasites such a trematode (flatworms), Cestodes (tapeworms) and nematodes (roundworms) may also occur. Viral and fungal transmissions are predominantly caused by eating uncooked (raw) or undercooked fish tissues. The presence of diseases that are zoonotic and therefore pose a potential threat to humans cannot be taken lightly in wild-caught fish. Of the five diseases listed in Table 1 as being zoonotic, two are of specific concern: Enterobacter cloacae and Plesiomonas shigelloides.

The increased interest in fish farming as an act of “sustainable aquaculture” has introduced this new identifiable population of farm-employed humans to be in danger of disease transmission. Enterobacteria cloacae may infect humans handling fish and not practicing good hand sanitation. Populations at risk would include those working on fish farms, the casual angler and the fish carcass

Continued on Page 53

"Fish Anyone" Continued From Page 52...

processor for commercial use in restaurants. While healthy fish may harbor zoonotic bacteria in the kidneys and intestines (or in this case the gills), organs not normally eaten by humans, it is still possible that bacterial contamination may occur during processing of carcasses. The most common route of infection is through open wounds on the hands exposed to the fish during handling. To alleviate infection, personal protection in the form of gloves should be worn when handling fish carcasses. Such infections will manifest as infection or inflammation at the entry site of the bacteria. If bacteria are ingested, gastroenteritis and other associated symptoms may occur.

TABLE 1

Bacteria	Type	Location in Fish	Comments
Aeromonas eucrenophila	Zoonotic	Gills	Gastrointestinal distress (diarrhea). Wound (infection, inflammation)
Aeromonas hydrophila	Zoonotic	Gills/Muscle Tissue	Gastrointestinal distress (diarrhea), septicemia Wounds (infection, inflammation)
Acinetobacter lwoffii	Zoonotic	Gills	Normally found in soil/water in summer. Bacteremia, pneumonia, and meningitis.
Acinetobacter johnsonii	Non-zoonotic	Gills/Muscle Tissue	Commonly contracted because of ingestion of spoiled food.
Brevundimonas vesicularis	Non-zoonotic	Gills	Contracted from infected soil and water.
Chryseobacterium indologens	Non-zoonotic	Gills	Contracted from infected soil, water, or contaminated foods.
Citrobacter freundii	Non-zoonotic	Gills	Contracted from infected soil, water, food, and intestinal tracts of animals.
Enterobacter cloacae	Zoonotic	Gills	Handling of fish carcasses, serious public health risk
Plesiomonas shigilloides	Zoonotic	Gills	Gastrointestinal distress from Tilapia and other affected fresh-water fish.

Zoonotic Fish-Related Bacteria of Concern:

The bacterial species Aeromonas is prevalent in freshwater species of fish with the most common being Aeromonas hydrophila. When seen in humans due to handling or ingesting affected fish, it causes symptoms that include edema/swelling at site of topical (ulceration) infection, respiratory infection, gastroenteritis, sepsis, urinary tract infections (UTI) or diarrhea. More importantly, Aeromonas has shown evidence of multi-antibiotic resistance to treatment by ampicillin, tetracycline, and streptomycin. This complicates the recovery efforts once a person is diagnosed. Aeromonas also may survive cold temperatures causing it to be a huge concern public health-wise in fish being used/preserved for food. The bacteria occur in fish by season with the United States catfish harboring the bacteria at highest levels during the summer months. It may be supposed that these levels would be the same for any fresh-water fish species in North American waters. Acinetobacter lwoffii is regarded as a "serious human pathogen" (Cao, et. al., 2018). It may cause severe bacteremia, pneumonia, and meningitis. Although very little research has been done on the zoonotic spread between fish and humans, it is known that it may be spread by touching infected surfaces or environments. For this reason, precautions should be exercised in handling potentially infected fish carcasses and ensuring the sterilization of all tools and surfaces used to process carcasses. This makes these bacteria especially troublesome to those who process fish for cooking without an eye for strict hygiene. Plesiomonas shigilloides has most commonly been

Continued on Page 54

"Fish Anyone" Continued From Page 53...

associated with Tilapia (Oreochromis niloticus), a commonly farmed fish; however, it may be found in wild-caught fish of other species such as the bass that was tested. In humans, the disease causes gastroenteritis that may be accompanied by fever, chills, nausea, diarrhea, or vomiting. It may also cause non-GI-related issues such as cellulitis, conjunctivitis, meningitis, and Urinary Tract Infections (UTI). While it is found most often in Asia, there are a variable number of cases each year in North America especially during the warm months. This bacterial infection is especially important to those who are immunocompromised. It should be noted that the spread of this disease is attributed to ingestion of raw or undercooked fish as well as contamination between foodstuffs during cooking and food preparation. This makes this of increased interest to the public health community, especially food inspection officials as similarly to Acinetobacter lwoffii, a high quality of cleanliness must be maintained to avoid potential infection.

Pond located at Camp John Hope - Fort Valley State University.

Conclusion

While public health officials including Environmental Health Specialists are not tasked with inspecting privately caught fish which may be consumed, they do have jurisdiction over commercial fish markets as well as restaurants that may be preparing local offerings. For this reason, it is important that they are reminded of the potential for human sickness because of eating such preparations. As stewards of the public trust regarding restaurants and the safety of consumers, the handling, storage, and preparation of fish must be carried out with care and a certain amount of oversight by the inspectors.

Among all the tasks that Environmental Health Specialists carry out, inspection of privately-caught fish is not on the list. However, many EHS personnel are well-known members of their community and often are the "go-to" people for their neighbors to ask about food safety. This does open the door for a possibly previously unknown educational opportunity between the GDPH and the communities they serve. By having knowledge about the potential for illness from mishandled freshwater Georgia wild-caught fish, they may be instrumental to their community, the next time someone is telling their latest "fish tale".

Bibliography

Cortes-Sanchez, A. E.-C.-R.-C. (2021). Plesiomonas: A Review on Food-Safety, Fish-Borne Diseases, and Tilapia. Hindawi The Scientific World Journal, 1-10.

Laboratory Finalized Report - 2023 - BASS - 1, 2023 BASS-1 (March 03, 2023).

Sheng, L. W. (2020). The Microbial Safety of Fish and Fish Products. Comprehensive Reviews in Food Science and Food Safety, 738-786.

Ziarati, M. e. (2022). Zoontic Diseases of Fish and Their Prevention and Control. Veterinary Quarterly, 95-118.


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