



Florida Section
**AIR & WASTE MANAGEMENT
ASSOCIATION**

Creating a Safe Harbor: Balancing Regulation, Environment and Innovation



February 4-5, 2025
Safety Harbor Resort & Spa
Safety Harbor, FL

2025 FL A&WMA Conference

WELCOME! And thank you for attending the Florida Section A&WMA's 60th annual conference and exhibition. After a disruptive hurricane season, this conference is a return to our traditional format with the goal of bringing the highest value for your membership. The conference features technical presentations, interactive panel discussions, and a student poster competition. The Florida Department of Environmental Protection, Environmental Protection Commission, academia, attorneys, engineers, consultants and industry representatives have been invited to speak about the most recent air, water, and waste issues.

The Florida A&WMA is hosting this year's conference at the Safety Harbor Resort & Spa in Safety Harbor, Florida. We are excited to hold this year's meeting in West-Central Florida to provide an opportunity for local Florida regulators and the industrial community to participate in the unique neutral forum that A&WMA is known for.

Our Conference Committee members have done an amazing job building this year's technical program. We have a very impressive list of speakers presenting on all aspects of current environmental "hot" topics.

We are all extremely thankful to our generous sponsors this year who have afforded us the opportunity to maintain reasonable registration rates, fund student scholarships, and allow the diversity of attendees that makes this conference a success.

We are pleased to share this program with you!

Your Conference Committee:

Byron Burrows, PE - TECO

Kevin Holbrooks - JEA

Chrissy Schaub, PE - Quadratic Consulting, LLC

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2025 FL A&WMA Conference

Thank you to our Sponsors!



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Conference Agenda February 04, 2025

| Time | Session Description/Moderator | Speaker Details | Presentation Title | Location |
|--|-------------------------------------|---|--|-----------------------|
| 7-7:45 am | | Registration | | Baranoff Lobby |
| | | Breakfast | | Baranoff Lobby |
| 7:45 - 8am | | Opening Remarks | | Baranoff Ballroom |
| 8 - 8:30 am | | Keynote Address: Leah Blinn | | Baranoff Ballroom |
| Air Technical Session | | | | |
| 8:30 - 10 am | Moderator: Libby Eastman, CDM Smith | Jeff Koerner, FDEP Jason Waters, EPCHC Greg Munson, Gunster Alex Reeder, Trinity Consultants | New PM _{2.5} NAAQS Ambient Air Quality Update Past, Present, and Future of the Greenhouse Gas Rule Federal Refrigerant Management Regulatory Updates:Pt 2 | Baranoff Ballroom |
| 10 - 10:15 am | | Break | | Baranoff Lobby |
| Waste-to-Energy Session | | | | |
| 10:15 - 12 pm | Moderator: Jason Gorrie | Dave Robau, National Energy Al Linero, Professional Justin Roessler, Roessler & Asc. Mike Carballa, Pasco County | Renewable Energy From Non Hazardous Secondary Matl Subpart Eb Municipal Waste Combustor (MWC) Standard Inflation Reduction Act Considerations Solid Waste Challenges From Hurricanes | Baranoff Ballroom |
| 12 - 1:30pm | | Lunch and Business Meeting Recognize Scholarship Winners | | Four Springs Ballroom |
| Clean Energy/Emergency Technology Technical Session | | | | |
| 1:30 - 3:00 pm | Moderator: Wei Liu, CDM Smith | John Kuhn, USF Byron Burrows, TECO Jared Strauss, Trinity Consultants | Demonstration of Emerging CO ₂ Conversion Technology Net Zero Opportunities & Challenges for the Power Ind Air Regulatory Considerations for Retrofitting Combustion Turbines for Hydrogen Co-firing | Baranoff Ballroom |
| 3:00 - 3:30pm | | Break | | Baranoff Lobby |
| Waste Technical Session | | | | |
| 3:30 - 5:00pm | Moderator: Joe Ullo, Carlton Fields | Maria Cristina Lemes, Geosyntec Consultants Jonathan Thorn, Eurofins Robert A. Velasco, TECO Tarek Abichou, FAMU-FSU | PFAS Forensics/Remediation PFAS Laboratory Update Renewable Natural Gas Project Methane Gas Research | Baranoff Ballroom |

February 05, 2025

| Time | Session Description/Moderator | Speaker Details | Presentation Title | Location |
|---|---------------------------------|---|--|----------------------------------|
| 7-8:00 am | | Registration Breakfast | | Baranoff Lobby Baranoff Lobby |
| Water Resource Management | | | | |
| 8:00 - 9:30 am | Moderator: Lindsay Starner, JEA | Shea Dunifon, JEA Erin Deady, Deady Law Mike Weatherby, HydroGeo | Reclaimed Water Trends Water Resources Trends Water Resource Solutions | Baranoff Ballroom |
| 9:30 - 10am | | Student Poster Competition | | Baranoff Ballroom |
| 10 - 10:15 am | | Break | | Baranoff Lobby |
| PANEL SESSION - GHG Trends & Opportunities | | | | |
| 10:15 - 12 pm | Moderator: Pradeep Halder, USF | Pradeep Halder, USF Kent Merril, OSG Bill Karl, SWCA Courtney Wright, TBRPC Greg Munson, Gunster Byron Burrows, TECO | GHG Tracking & Measurement CO ₂ Transport & Carbon Capture & Storage GHG Regulations Update Regional GHG Trends, Tracking, & Measurement GHG Policy Update Power Industry GHG Update | Baranoff Ballroom |
| 12 - 1:30pm | | Lunch and Closing Announce Poster Competition Winners | | Four Springs Ballroom |

Call For Student Posters

60th Annual Florida Section Conference & Exposition

The Florida Section is pleased to announce the **60th Annual Conference and Exposition being held on February 4th and 5th in Safety Harbor** at the Safety Harbor Resort & Spa on Tampa Bay. The event will offer several technical presentations by leaders in their fields, covering a broad range of the **hottest issues** with participation by representative regulatory agencies from around Florida including Florida Department of Environmental Protection (FDEP), leading consultants, and academia. The conference has been specifically designed to enhance opportunities for **networking and discussion** with experts in air, water, and waste. Our student programs feature the Student Poster Competition.

University/college students are invited to submit abstracts on topics of environmental interest for presentation at a Student Poster Session. Abstracts are limited to 300 words or less and must identify the title of the presentation, author name(s), level of participation (undergraduate or graduate), category (engineering-related and legal/regulatory related topics), and full mailing and e-mail addresses. Abstracts must not be more than one (1) page in length and must be double-spaced. The posters will be judged by AWMA members and the following prizes will be awarded:

First Place: \$750

Second Place: \$500

Third Place: \$250

In addition, the Florida Section is providing free accommodations at the resort to a limited number of student poster participants.

Student Poster Guidelines

1. There is no prescribed format for the body of the poster. However, the poster **MUST** include the title, an author listing and the affiliations of all authors.
2. Figures, graphs and tables should be uncluttered and simple, arranged in the sequence in which you want them to be viewed.
3. Authors should prepare a brief (4-5 minute) presentation to be used during the judging. The presentation should clearly articulate the problem addressed by the research and summarize important conclusions.
4. Poster setup will be from 7:30 to 9:30 a.m. and judging will take place from 9:30 to 10:00 a.m. on Wednesday February 5, 2025.
5. The Student Poster Session Awards will be announced on Wednesday February 5, 2025 at the closing lunch session.

For More Information, Please Contact:

Libby Eastman

or

Byron Burrows

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Safety Harbor Ghost Tour

Price: **\$25.00**

Discover the legends and the rich history of downtown Safety Harbor, Florida, as you visit sites like the St. James Hotel, Hotel Frances, and the conference's own Safety Harbor Resort and Spa. Paranormal investigator Cynthia will share the ghost stories of the spirits that still roam these streets and see the how ghost hunting equipment work. Important: You must be able to traverse 1 to 1.5 miles, over the span of an hour.



2024 Student Scholarship Awards

Axel Hendrickson Scholarship for 2024

Kapiamba Fabrice, University of Miami,

\$1,000 cash prize and a complimentary one-year A&WMA membership.

Clair Fancy Scholarship for 2024

Katy Borders, Florida State University

\$1,000 cash prize and a complimentary one-year A&WMA membership.

FL AWMA Scholarship for 2024

Laura Rojas, Florida Atlantic University,

\$500 cash prize and one free FL AWMA conference registration.

Opeyemi Ijidale, University of South Florida

\$500 cash prize and one free FL AWMA conference registration.

Shreya Sapkota Dhakal, Embry-Riddle Aeronautical University

\$500 cash prize and one free FL AWMA conference registration.

Haley Shelton, University of North Florida

\$250 cash prize.

Martha Santos, University of Central Florida

\$250 cash prize.

Student Poster Competition

Functional Stability Criteria and Approaches for Post-Closure Care Assessment of Coal Combustion Residuals Landfills

Nimna Madurangi¹, Poyu Zhang², Jiannan (Nick) Chen³, and Craig H. Benson⁴

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ABSTRACT: Coal Combustion Residuals (CCR) are by-products generated from the combustion of coal in power plants. CCR waste streams contain toxic elements including several heavy metals, which pose significant risks to human health and environment (HH&E), making their safe disposal critical and challenging. Federal regulations mandate a post-closure care (PCC) period of 30 years for CCR landfills, allowing this period to be altered if the revised period is demonstrated to be sufficient to protect HH&E. However, criteria for determining PCC completion remain undefined. Performance-based approaches for assessing PCC have been developed for municipal solid waste (MSW) landfills, defining “functional stability” as the state in which the landfill no longer poses a threat to HH&E, at the point of exposure, without active management. This study leverages the elements of such approaches used in MSW landfills, and develops a similar framework for CCR landfills, considering their similarities and distinct differences. The developed framework comprises of four modules: Leachate, Groundwater, Structural stability, and Cover integrity. Each module is assessed systematically through phases that include fulfilling prerequisites and data requirements, analyzing statistical trends in monitoring parameters, ensuring compliance with federal and state regulations, and ultimately determining whether PCC should be continued, altered, or terminated. Data from multiple CCR landfills are analyzed to identify critical trends and parameters, that are related to leachate generation and composition, spatial and temporal variations in groundwater quality, and landfill stability. Numerical modeling is employed to simulate leachate generation pre- and post-closure, incorporating variations in climate, cover designs, and CCR properties. These models are further extended to simulate contaminant transport and predict the leaching behavior of heavy metals under various scenarios. The study presents a robust and versatile framework for PCC management, optimizing resources, ensuring environmental protection, and facilitating authorities with informed decision-making tools to enhance efficiency and sustainability.

Student Poster Competition

Quantifying Wellbore Effects during CO₂ Sequestration in a Saline Aquifer

Uzoma Ajugwe (Graduate Level)

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ABSTRACT: Carbon capture and storage (CCS) is a strategy for mitigating climate change by reducing greenhouse gas emissions from large stationary sources like fossil-fuel-fired power stations. One method of CCS involves carbon dioxide (CO₂) sequestration in deep saline aquifers, where supercritical CO₂ is injected into an aquifer. The success of such projects depends on accurate predictions of CO₂ behavior within the subsurface, which are obtained through numerical simulations. TOUGHREACT, a renowned simulation tool, models subsurface fluid flow, geochemical interactions, and solute transport, providing insights into the feasibility of CO₂ sequestration projects.

A critical aspect of these simulations is the apportioning of CO₂ injection across different vertical layers of the aquifer. Current hydrogeological algorithms estimate CO₂ distribution based on overall injection rate, layer thickness, and horizontal permeability. However, this traditional method neglects the influence of wellbore pressure dynamics and pressure gradients within the injection well and surrounding aquifer. The omission of these factors introduces uncertainty in the accuracy of simulation results, potentially affecting key feasibility metrics for CCS projects.

The objective of this research is then to determine if it is necessary to account for the effects of wellbore pressure and fluid flow within the injection well during simulations of CO₂ injection into deep saline aquifers, or if these factors can be safely ignored. Making this determination will ensure that simulation results from TOUGHREACT are interpreted appropriately when assessing the feasibility of a proposed CCS project.

Through a set of TOUGHREACT simulations, I determined that it is unacceptable to ignore wellbore effects during CO₂ injection into narrow injection wells screened across the entire injection zone. However, if the wellbore is sufficiently wide, and/or if the well is screened only in the bottom portion of the injection zone, then it might be acceptable to ignore wellbore effects and use the simpler simulation method.

Student Poster Competition

Transforming Scrap Tires into Amine-Functionalized Activated Carbon Adsorbents for Landfill Gas Upgrading

Brandyn Nutter, Amirjavad Ahmadian Hosseini, Laura Rojas, Sierra Mugan, and Masoud Jahandar Lashaki

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ABSTRACT: Scrap tire waste generation in the U.S. has increased by over 32% since 2013, while the reuse of tire-derived materials has decreased by more than 25%, resulting in a 123% rise in landfill disposal in the same period. These statistics underscore the need for new markets and innovative recycling solutions. This study explores the conversion of scrap tires into amine-functionalized activated carbon (aminocarbon) materials for landfill gas (LFG) purification. LFG, generated through the anaerobic decomposition of organic waste in landfills, is comprised of methane (CH₄; 50-60 vol.%), carbon dioxide (CO₂; 40-50 vol.%), and smaller amounts of hydrogen sulfide (H₂S), water vapor, and siloxanes. Upgrading LFG into renewable natural gas (RNG) supports clean energy production while mitigating greenhouse gas and odor emissions.

To evaluate the feasibility of scrap tire-derived adsorbents for LFG treatment, tire waste was characterized to determine composition and pre-treatment needs. Carbonization was conducted using microwave heating and muffle furnace methods, followed by activation to produce porous activated carbon (AC). Select AC samples were modified with diethanolamine (DEA), tetraethylenepentamine (TEPA), and branched polyethylenimine (PEI) at loadings of 20, 30, and 40 wt.%. CO₂ adsorption capacities were tested under dry conditions (30 vol.% CO₂, balance N₂), with the performant sample being further assessed under humid conditions. H₂S adsorption performance was evaluated to determine the multifunctionality of the synthesized adsorbents. Preliminary results show that tire-derived aminocarbons exhibit significant potential for removing multiple LFG contaminants.

Acknowledgements: This work was supported by funding from the Florida Hinkley Center for Solid and Hazardous Waste Management.

Student Poster Competition

Studying the Performance and Stability Characteristics of Triamine-Modified Mesoporous Silica Materials for CO₂ Capture from Ambient Air

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ABSTRACT: The concentration of CO₂, the primary greenhouse gas driving global warming, has risen sharply since the Industrial Revolution. By 2024, global average CO₂ levels reached 425 parts per million (ppmv), compared to 315 ppmv in 1958, driving a nearly 2°F increase in global temperatures since the pre-industrial era. Direct air capture (DAC) of CO₂ offers a promising solution to mitigate these effects. Recognizing its importance, the U.S. Department of Energy has identified DAC as essential for achieving net-zero emissions by 2050. Among emerging DAC technologies, amine-modified silica materials (aminosilicas) stand out for their strong potential to address climate change. This study focuses on developing triamine-grafted silica adsorbent materials optimized for DAC. Triaminosilane, containing two secondary amines and one primary amine, was chosen for its high CO₂ affinity. CARiACT G-10 silica was selected as the support material due to its affordability, high pore volume, large surface area, small particle size, and wide pores, properties that enable high amine loading and efficient CO₂ adsorption. A series of materials were synthesized by varying water and triamine quantities, and Thermogravimetric analysis (TGA) was employed to evaluate amine content, CO₂ uptake, adsorption efficiency, and kinetics. Water played a crucial role in the synthesis process by facilitating amine attachment to the silica surface. Higher water levels resulted in increased nitrogen content, indicating successful grafting. However, materials with the highest amine loadings exhibited reduced CO₂ uptake under dry conditions due to restricted pore accessibility. These findings emphasize the importance of precise control over both water and amine amounts to maximize material performance. The top-performing material, exhibiting the highest CO₂ uptake and fastest adsorption kinetics, underwent rigorous testing involving 50 adsorption-desorption cycles. The material demonstrated stable performance, retaining 99% of its initial CO₂ uptake. These findings emphasize the promise of aminosilicas in DAC applications, offering a practical pathway to combat climate change.