

MARCH
28
2024

Perspectives on

SUSTAINABILITY

11TH ANNUAL
SUSTAINABILITY
SYMPOSIUM

Bucknell Center for Sustainability & the Environment

PROGRAM WITH ABSTRACTS

March 28, 2024

Center for Sustainability and the Environment
Bucknell University

<http://sustainabilitysymposium.scholar.bucknell.edu/>

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The Sustainability Symposium celebrates sustainability and environmental related research, teaching, creative works, practice, and action where faculty, staff, students, and community stakeholders from regional institutions share their completed and ongoing works, network for ongoing or new initiatives, and are inspired by shared keynote activities. This annual meeting showcases work from the natural sciences, physical sciences, social sciences, engineering, management, and humanities exploring emerging themes such as climate change, energy, human rights, food, and resilience.

The Center for Sustainability & the Environment

The Bucknell Center for Sustainability & the Environment creates impactful, interdisciplinary, experiential opportunities for learning and research that address global and environmental challenges. By enabling collaborative scholarship from across the University, we empower students and faculty to explore, learn about, engage with and transform their world.

The Center for Sustainability & the Environment was created as the Bucknell Environmental Center in 2005 with support from about 50 faculty and staff from across the University and from students, who helped to define areas of interest. From the beginning, the center sought to create a University-wide platform capable of supporting collaborative, interdisciplinary scholarship, teaching and outreach, situating Bucknell as a national leader in applied research and teaching on 21st-century environmental and sustainability issues.

Today, the Center's three signature programs manage a network of 18 interdisciplinary field stations and sites in Pennsylvania giving students, faculty, and community partners experiential, applied research and learning opportunities that impact our local communities and beyond.

Watershed Sciences & Engineering Program

Bucknell makes the most of our proximity to the majestic Susquehanna River through the Watershed Sciences & Engineering Program. By taking the classroom outdoors, Bucknell connects people to the river and builds upon our existing strengths in science and engineering. Faculty, staff and students partner with local, state and federal organizations on watershed research, stewardship and conservation projects.

Sustainable Technology Program

Bucknell's Sustainable Technology Program works to build on the University's advances in sustainable technology through research, programs and projects. Using the campus as a living-learning laboratory, the program brings a collaborative, hands-on approach to a variety of topics, including climate change, renewable energy and eco-landscaping.

Place Studies Program

The Place Studies program explores how we imagine, sustain, understand, and engage with place historically, in the present, and in potential futures, and brings this to life through experiential and transformative education and scholarship. It is, at its core, about creating transformative approaches to understanding human-environment relationships, broadly defined, and over time. This includes areas such as sustainable communities, community revitalization, environmental histories, policy, environmental justice, energy transition, placemaking and place meaning, creative works with sustainability and/or environmental foci, and more.

Letter from Symposium Chair

Welcome to the 11th Annual Sustainability Symposium!

In 2013, the Center for Sustainability and Environment held its first sustainability symposium, *Envisioning a Sustainable University*. That event furthered discussions and actions that continued to push Bucknell's progress towards being a more sustainable institution. In the years since, the sustainability symposia have centered on topics including Reimagining Prosperity (2014); Imagination, Design, and Creativity (2015); Global Sustainabilities (2016); Generations of Power (2017); Climate Changes: All Hands on Deck (2018); Envisioning the Future: Energy, Climate, and Human Rights (2019); Adapting in Uncertain Times (2021); Is it Really too late?: Hope, Agency, and Change (2022); and Moving from hope to action: Building thriving communities (2023). Each symposium has engaged attendees in discussions furthering our understanding of human-environment interactions; showcasing projects, creative works, and research from across disciplines; and engaging practitioners and researchers in collaborative endeavors for thriving communities.

This year's Symposium, *Perspectives on Sustainability*, invites us to consider the ubiquitous and contested term "sustainability" and how it is differently understood. 'Sustainability' can stand in as an aspirational shorthand, or be so broad as to be co-opted in a wide range of sometimes conflicting uses. At the 18th Annual River Symposium held this past fall, Oren Lyons, Chief and Faithkeeper of the Onondaga and Seneca Nations Haudenosaunee Confederacy, spoke on "A Faithkeeper's Perspective on the 'Sustainability.'" His answer: Peace. This spring, we invite the campus community to join together to explore different perspectives on sustainability, and to focus on the common objectives we hold for equitable, thriving human and natural communities, regardless of what we call it.

We begin with a keynote address by podcast host and producer, creative performance artist, scholar, and environmental advocate Peterson Toscano on "Art, Advocacy, and Action: Queer Lessons for Sustainable Futures." From here we move to an interdisciplinary panel discussion on the perspectives and utility of "sustainability." After a social hour, we cap the day with a Sustainability Expo featuring a range of creative works, research, and environmental activism.

This year, we welcome over 25 speakers/presenters representing more than 70 authors, activists, practitioners, and artists. We welcome you to learn from one another, inspire one another, and create new networks that nurture pathways for thriving in our communities and work.

*Dr. Shaunna Barnhart
Chair, 11th Annual Sustainability Symposium*

Schedule of Events

THURSDAY – MARCH 28

All events are held in MacDonald Commons

12:00 p.m. – 1:00 p.m. Keynote Address by Peterson Toscano: **“Art, Advocacy, and Action: Queer Lessons for Sustainable Futures.”** Lunch Provided

1:00 p.m. – 2:20 p.m. **“Perspectives on Sustainability: An Interdisciplinary Discussion”**

Panelists:

Tulu Bayar - Art & Art History Art
Leandro Bonfim - Management & Organizations
Deborah Sills - Civil & Environmental Engineering
Austin Wadle - Post-doc in Civil & Environmental Engineering
Peter Wilshusen - Environmental Studies & Sciences

Moderator:

Coralynn Davis - Women’s and Gender Studies; Anthropology

2:30 p.m. – 4:00 p.m. Drop-in Social and Expo set-up

4:00 p.m. – 5:30 p.m. Sustainability Expo
Range of research, creative works, and tabling showcasing sustainability and environment related scholarship, action and more.

5:30 p.m. Expo Awards and Closing Remarks

Keynote Address

Art, Advocacy, and Action: Queer Lessons for Sustainable Futures

(March 28, 12:00-12:50pm – MacDonald Commons)



Peterson Toscano

*Podcast Host and Producer,
Creative Performance Artist,
Scholar, and Environmental Advocate*

In "Art, Advocacy, and Action: Queer Lessons for Sustainable Futures," Peterson offers a captivating preview into reimagining environmentalism through a queer lens. Leveraging his multifaceted expertise as a performance artist and environmental advocate, he invites us to look beyond individual actions to systemic change. Drawing parallels between the LGBTQ+ rights movement's strategic use of storytelling, art, and advocacy, Peterson considers how these tactics can inspire a more inclusive and effective approach to sustainability. This talk promises to challenge our perceptions, advocating for a climate justice framework that acknowledges the intersections of identity, including disability, race, class, age, and gender. Peterson suggests that the key to genuine sustainability and justice lies in our collective action and empathy, urging us to consider how we can contribute to a future that honors diversity and equity.

About Peterson Toscano:

Peterson is a dynamic and creative performance artist deeply engaged in the intersection of environmental activism and storytelling. Based in rural Central Pennsylvania, he brings a unique perspective to the discourse on climate change, leveraging his expertise to produce compelling radio shows and podcasts. Peterson's work is not only a call to action but also an invitation to explore the complexities of sustainability through the lens of art and personal narrative.

His commitment to raising awareness and fostering meaningful conversations about environmental issues has made him a sought-after voice in the sustainability community. Peterson's approach to activism is deeply informed by his personal identity and values, including his faith and experiences as a member of the LGBTQ+ community, enriching his contributions with a diverse and inclusive outlook.

Panel Discussion

Perspectives on Sustainability: An Interdisciplinary Discussion

(March 28, 1:00-2:20pm – MacDonald Commons)

An interdisciplinary panel of faculty share perspectives on “sustainability” - that slippery and contentious term - from their own research, life, or disciplinary perspective. As we learn from these diverse perspectives, we invite you to consider what this term means to you and how we can focus on common objectives for equitable, thriving human and natural communities, regardless of what we call it.

Panelists:



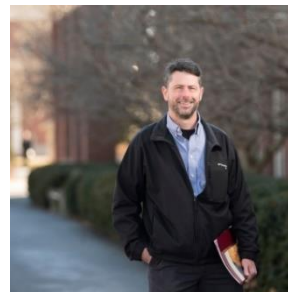
TULU BAYAR -
Professor of Art and
Chair of Art and Art
History



AUSTIN WADLE -
Smith Post-Doctoral
to Tenure Track in
Civil &
Environmental
Engineering



LEANDRO BONFIM
- Assistant Professor
of Management &
Organizations



**PETER
WILSHUSEN** -
Professor of
Environmental
Studies & Sciences



DEBORAH SILLS -
Associate Professor
of Civil &
Environmental
Engineering



Moderator:
**CORALYNN V.
DAVIS** - Chair of the
Faculty; Presidential
Prof. of Women's &
Gender Studies;
Chair of Women's &
Gender Studies



Creative Works

"An Introduction to The Bucknell Farm: The Future of Regenerative Agriculture"

Jamie Granato, Center for Social Science Research, Bucknell University

For over a year, I have been producing, co-writing, directing, and editing an introductory film about The Bucknell Farm. We wrote a script that introduces the essential techniques and systems that the Bucknell Farm uses: systems like no-till agriculture, swale and berm, and cover crops. These examples allow The Bucknell Farm to be a model of what the future of regenerative agriculture looks like. Many professors and community members utilize the farm throughout the semester as a teaching tool, so we thought it would be useful to have a condensed, ~5 minute film that highlights student farmers and faculty discussing the imperative techniques that The Bucknell Farm uses. In addition to being what the future of ethical, environmentally - attuned farming looks like, one of the core characteristics of local, organic, and regenerative agriculture is the community involvement and impact that surrounds it.

Preproduction for this film started last winter when I became a CSSR fellow— I co-wrote the script with Jen Schneidman Partica, the Bucknell Farm and Garden Manager, and Professor Clare Sammells of the Anthropology Department and 2022-23 Farm Faculty Director. After writing the script, we started reaching out to student farmers to gauge interest for who'd want to be "interviewed" for the film— during this time I started personally filming and gathering b-roll to use on top of the a-roll interview footage. In April to May I shot the majority of the interviews in different places on The Bucknell Farm, using a cinema camera to properly capture the beauty of the farm as well. Finally, the months since then have been devoted to postproduction, which constitutes cutting up the interviews, overlaying b-roll, and making graphics to raise the production quality of the film even further.

Agnes, Revisited: A Rephotography Exhibit for the 50th Anniversary of Tropical Storm Agnes (1972)

Andrew Stuhl, Associate Professor and Chair, Environmental Studies and Sciences, Bucknell University.

Taylor Lightman, Director, Lewisburg Neighborhoods

June 2022 marked the 50th anniversary of Tropical Storm Agnes (1972). "Agnes" spawned destructive heights of the Susquehanna River and nearby tributaries that inundated large portions of Lewisburg, PA and other river towns. In this exhibit, you'll find five pairs of photos. Each pair of photos depicts a single location in Lewisburg, PA at two moments in time — June, 1972 and the spring of 2022. This photo series, then, helps visualize the threat of flooding in Lewisburg, as well as the damages and recovery efforts from Agnes. This exhibit is the result of a collaboration between members of the Bucknell Spring 2022 class "Susquehanna Valley History," taught by Prof. Andrew Stuhl, and Taylor Lightman, Program Director of Lewisburg Neighborhoods.

Soundscape Compositions by the members of MUSC207 Global Pop and Global Warming

Tyler Yamin, Visiting Assistant Professor of Music (Ethnomusicology), Bucknell University

In my Spring class MUSC207 Global Pop and Global Warming, students are exploring various intersections between music making and climate change/the Anthropocene. Currently, they are composing and producing electronic musical works based on soundscapes they have recorded on Bucknell's campus and elsewhere, in order to express musically the sonic dimensions of climate change. I envision our contribution to the expo as a table (ideally) or other display that includes speakers playing a continuous loop of their projects (about 45 minutes of content) and a computer monitor displaying each student's "artist statement" about their musical intentions timed to cycle with the audio playback. Ideally several of my students will also be present to answer questions about the project.



Poster Presentations

Substance Use Disorder in Maternity Care

Priya Batchu, Undergraduate Student, Bucknell University; **Shaunna Barnhart**, Center for Sustainability & the Environment, Bucknell University

Individuals with substance use disorder (SUD) face unique barriers in accessing and navigating the healthcare system such as stigma and lack of support. In particular, pregnant women and new mothers with SUD face additional challenges and assumptions surrounding their competency as a mother. The Susquehanna Valley United Way's United in Recovery Program provides resources including initiatives to provide a Plan of Safe Care and further support in their well being. In collaboration with Bucknell's Center for Sustainability and the Environment, this project seeks to understand SUD and stigma particularly its impact on pregnant/new mothers. Through surveys and interviews, this project explores healthcare workers and pregnant/new mothers perspectives on healthcare for those with SUD and pregnancy. Healthcare workers' perspectives are crucial to identifying gaps and opportunities in providing care for pregnant women with SUD. Survey questions address their experiences, training needs, and perceived barriers to delivering effective healthcare. Simultaneously, surveys for the patients affected explore their experiences with healthcare services and stigma.

Analysis connects the findings and the sustainable development goals (SDGs), particularly those related to health, gender equality, and reduced inequalities. The initiative aims to contribute to SDGs by advocating for improved healthcare services, reducing stigma, and fostering inclusivity. The overarching goal of this project is to contribute to a more equitable and sustainable healthcare system for pregnant women facing Substance Use Disorder in the Susquehanna River Valley Region.

Modern Approaches to Cleaning Indoor Air and the Potential for Disinfection Byproduct Formation

Douglas Collins, Assistant Professor of Chemistry, Bucknell University

Recent advances in health science, catalyzed by the emergence of SARS-CoV-2, have revealed the prevalence of airborne modes of disease transmission through airborne particulate matter. Efforts to mitigate the risks associated with airborne disease transmission have been met with an explosion of air cleaning technologies, some of which are genuinely new, while others are based on the fundamentals of

techniques known for longer periods of time. The air cleaning industry is not tightly regulated; only ozone emissions from air cleaning units have been assigned a limit. At the same time, some technologies, including several that were heavily promulgated during the height of the COVID-19 pandemic response, use chemical oxidation reactions to disinfect and “remove” pollutants from indoor air. The ambient atmosphere is, indeed, an oxidizing medium and the main academic thrust of atmospheric chemistry as a field of study is to understand the nature of oxidation reactions in different environments and contexts. Since oxidation has generally low chemical selectivity for pollutant removal – strong oxidants react with a wide array of compounds, not just those of particular interest for remediation – the formation of byproducts can be rampant and not always well described. This presentation will describe the efficacy and potential for byproduct formation from a variety of classes of air cleaning systems. Air cleaning system implementation is growing, especially in advanced building systems with a sustainability focus, and it is important to obtain an appreciation for the unintended consequences of air cleaning chemistry.

Removal of Critical Elements from Acid Mine Drainage in Shamokin, PA

Melanie Gamboa, Undergraduate Student, Bucknell University; **Mary Kate Dick**, Undergraduate Student, Bucknell University; **Hannah Barnum**, Undergraduate Student, Bucknell University; **Matt Higgins**, Claire W Carlson Chair in Environmental Engineering, Professor of Civil & Environmental Engineering, Faculty Director of Bucknell Center for Sustainability & the Environment

Acid mine drainage (AMD) has been an issue in Shamokin, PA since the rise of coal production in the 19th century. The resulting mine shafts exposed more bedrock to water and air than what would naturally occur, which reacted with minerals in the bedrock in a series of chemical reactions to produce AMD. These reactions start with the oxidation of pyrite, FeS_2 , an iron sulfide that has a yellow color and metallic luster. AMD afflicts Shamokin Creek with a sulfur smell and a red or gray discoloration to the water from high metal concentrations. The Department of Energy (DOE) has classified a group of elements as critical to energy because they have a finite amount available on earth. Since the water in the Shamokin Creek Watershed is harmful to the environment and has high concentrations of these valuable elements, we are designing a project to improve water quality by removing and selling these elements and bringing the water quality up to standards set by the Pennsylvania Department of Environmental Protection (PADEP). We are using chemical precipitation methods to remove 6 different. Iron and aluminum critical elements were removed at pH 5. The pH was raised to 10 to remove nickel, magnesium, and neodymium. Where iron, cobalt, nickel, and neodymium had a 100% removal rate.

Senior Consulting Project with Bucknell Farm

Jenna Hall, Undergraduate Student, Bucknell University; **Kalli Wethern**, Undergraduate Student, Bucknell University; **Jake Fowler**, Undergraduate Student, Bucknell University; **Isabella Mantilla**, Undergraduate Student, Bucknell University; **Eric Martin**, Professor of Management & Organizations, Bucknell University

A consulting class in the Freeman College of Management is working with the Bucknell Farm as a senior project. The goal is to help the Farm define who they are, what they do and specifically what they don't do. The project is looking for new ideas about how to get more student engagement at the farm to achieve their goal of the farm being another place for students to learn, grow and be themselves.

Creating Proactive Policy: Analyzing Pennsylvania's New Environmental Justice Policy

Zane Hensal, Undergraduate Student, Bucknell University; **Shaunna Barnhart**, Center for Sustainability & the Environment, Bucknell University.

Pennsylvania has over 45,000 square miles of dense forest, thriving cityscape, and charming towns across all 67 counties with local economies depending on a range of industries from natural resource extraction to manufacturing. However environmental impacts from these activities can have detrimental impacts on local communities, opening the door for a need for protective policy measurers. This research dives into the complexity of Environmental Justice (EJ) policies in Pennsylvania, specifically focusing on the impacts of the newly revised Environmental Justice Policy by the Pennsylvania Department of Environmental Protection (DEP) and the overall reception in both rural and urban communities. There are clearly defined revisions throughout the policy, such as new criteria in designating EJ areas, grant opportunities, and a mandated public comment section when permit applications revolve around trigger projects, such as mining permits, waste permits, and air permits. Analysis of the public comment sessions held throughout the Commonwealth in 2023 shows that many constituents have questions surrounding the Department's capability of enforcement, the decision-making process, and the potential repercussions these decisions can have on the community. While many Pennsylvanians possess concerns about the policy, many environmental scientists and advocacy groups feel as though this is a step in the right direction for ensuring Pennsylvania has access to a lively and clean environment, as granted by their constitutional right in Article I Section 27 of the Pennsylvania Constitution.

Integrating Technical Sustainability into an Introductory Circuits Course

Brennah Kennedy, Undergraduate Student, Bucknell University; **Alan Cheville**, Professor of Electrical Engineering, Bucknell University

This study explores integrating technical sustainability principles into an introductory circuits course within the Electrical and Computer Engineering (ECE) curriculum at Bucknell University. Led by student researcher Brennah Kennedy and mentor Alan Cheville, the project aims to develop two sustainability-focused laboratory experiments. By incorporating sustainability concepts into practical applications such as power factor and Thevenin Equivalent Circuit (TEC), students will be better prepared for careers in a changing job market that prioritizes sustainability. The methodology involves creating pre-laboratory assignments to introduce sustainability concepts and integrating them into lab activities, fostering environmentally conscious engineering practices. While the labs have yet to be implemented, the research plan includes piloting them in the upcoming academic year and refining them based on student feedback. This project, funded as part of a larger study restructuring the ECE curriculum, contributes to promoting sustainability in engineering education and enhancing efficiency and cost savings for organizations.

Reclaiming Vacant Lots for Neighborhood Parks in Coal Mining Towns: Connections between Place, Pride, and Revitalization

Matt McMullen Undergraduate Student, Bucknell University; **Shaunna Barnhart**, Center for Sustainability & the Environment, Bucknell University

Urban greening introduces recreation and green spaces for community members to enjoy, connect, and both create and experience a sense of place. Post-industrial towns experiencing “shrinkage” are home to vacant and abandoned lots that can be repurposed as neighborhood assets in the form of parks. This paper explores a comparative case study in Pennsylvania’s lower anthracite coal region of how vacant lots in two anthracite coal mining towns, Shamokin and Kulpmont, are being converted into community assets to fit the community’s vision for revitalization and the impact this has on community perceptions of place and connection. Through surveys and interactive community feedback opportunities, this research shows that there are strong responses to, and correlations between, feelings of pride, hope, and connection. There is also a demand for more parks, a need for more spaces to gather as a community, and a recognition that repurposing vacant lots could address these needs. These results indicate that the inclusion of more parks in place of vacant lots can increase connectedness among residents. Revitalization efforts that add additional places for people to gather and socialize can therefore create stronger community connections thereby increasing residents’ hope for their community’s future and fostering their sense of connection to each other and place.

Planting Trees That Die is Worse Than Planting None At All: Sustainable Tree Planting in a Changing Climate

Jake Milofsky, Director of Tree Care and Reforestation, Tree Pittsburgh

There is a ton of funding and excitement out there right now for tree planting, but all too often, the future of the trees is not thought of in the planning process. Without a sound strategy in place for maintenance and care, planting trees is often a waste of resources that has a larger carbon footprint than not planting them at all.

At Tree Pittsburgh, we implement a variety of strategies to ensure the best chance of survival for the trees we plant so that they can grow to their maximum potential for providing the ecosystem services that are so important for resilience in a changing climate. Through volunteer leadership, long-term funding strategies, workforce development, education, advocacy, community organizing, and a host of other approaches, Tree Pittsburgh works to ensure our tree planting initiatives are sustainable over time, and not just a flash in the pan that takes advantage of current enthusiasm around tree planting.

Exploring Expansion of Biogas Energy Production on Homesteads, Small-Scale, and Large-Scale Farms

Morgan Powell, Undergraduate Student, Bucknell University; **Shaunna Barnhart**, Center for Sustainability & the Environment, Bucknell University

This project analyzes how the perception and implementation of biogas differs across large-scale farms, small-scale farms, and homesteading operations. Its end goal is to better understand the economic feasibility and practicality of biogas at different scales with the hope of establishing a more solid foundation for the sustainability community to operate on and more widespread use of biogas. Both a survey and in-person interviews were conducted during this research. The results of both indicate that existing literature does not accurately represent the state of biogas in Pennsylvania. While public perception and existing studies indicate that biogas is most effective on large-scale farms, this study finds that biogas on a micro scale is overall more affordable, accessible, and easy to maintain. With 17% of the large scale farms using biogas in Pennsylvania responding to the survey and on-site visits to two large scale farms, the results show that the cost to maintain a large biogas digester (all of which were over \$1 million to build) are potentially prohibitive for the long term viability of large scale systems. In contrast, the small scale users who are building smaller household scale systems for on-site use for energy generation (all of which were under \$1,000 to build) report minimum expenses necessary for maintenance.

The Effects of Fouling on Solar Panel Energy Production

Aditya Pudasaini, Undergraduate Student, Bucknell University; **Peter Jansson**, Associate Professor of Electrical Engineering, Bucknell University; **Milton Newberry III**, Director of Multicultural Programs, Penn State University

Solar energy has had a rapid boom in uses and improvements over the past few decades as an alternative to non-renewable energy sources, especially in residential systems. The power production of solar panels depends on the panel wattage, inverters, wiring, and the amount of sunlight received. As such, no photovoltaic system (PV) is ever 100% efficient with respect to its components, but there are ways to ensure that it continues to operate effectively. Fouling is the accumulation of dirt, debris, fungi, bird droppings, pollen, and more on the surface of PV systems. Cleaning panels is one such way to get rid of this fouling and is vital for residential systems even if the PV systems are smaller than industrial ones and power loss isn't always so apparent at first. For residential systems, an extension pole with a brush or rag is most easily accessible, as hosing down panels cannot remove all the dirt and debris. On top of this, a chemical solution on top will also ensure better cleaning. The proposed method will increase the energy output of one's PV system and help determine how often cleaning is necessary and the money saved.

Acid Mine Drainage Remediation in Shamokin, PA

Luke van Dyke, Undergraduate Student, Bucknell University; **Kayla Lincalis**, Undergraduate Student, Bucknell University; **Leeann Michael**, Undergraduate Student, Bucknell University; **Matt Higgins**, Claire W Carlson Chair in Environmental Engineering, Professor of Civil & Environmental Engineering, Faculty Director of Bucknell Center for Sustainability & the Environment

The city of Shamokin, Pennsylvania is impacted by acid mine drainage as a result of the area's history of anthracite coal mining. Acid mine drainage is the formation and movement of highly acidic water with high concentrations of metals including iron and aluminum. Multiple discharge sites are located within the watershed, impacting Shamokin Creek and its tributaries: Carbon Run, Coal Run, Quaker Run, Miller Run, and Buffalo Run. Shamokin Creek discharges into the Susquehanna River. The project objective is to improve stream water quality in Shamokin Township by evaluating water quality and designing treatment system(s) to treat acid mine discharge. The project client is the Shamokin Creek Restoration Alliance (SCRA), which aims to restore the streams in the area to acceptable standards. Site locations must be selected for the implementation of treatment systems as well as the type of treatment system at each location. The site locations' key constraints are that it must be on county-owned land and must have sufficient space for a treatment system. The design criteria for the type of treatment chosen include the ability to meet water quality requirements, operation and maintenance, and economics. The water quality of the Shamokin Creek should be restored to Pennsylvania Water Quality Standards for warm water fisheries and migratory fisheries, while Shamokin Creek's unnamed tributaries are designated as cold water fisheries. Water quality criteria include iron, aluminum, and acidity loading rates, pH, and dissolved oxygen concentration. Water quality data from previous investigations were used to create maps in GIS of

these criteria. Decision matrices were used to identify the three sites that meet our criteria and constraints. The project should prioritize sustainability by aiming to improve stream water quality while minimizing costs by the designing of a system that does not require significant maintenance or upkeep.

30 years of Community Activism against Toxic Waste Processing Facilities in Central PA

Amanda Wooden, Professor of Environmental Studies and Sciences, Bucknell University

This research results from interviews, surveys, GIS mapping, and participant observation I and my team of students conducted since 2013 about three decades of community activism against the siting of toxic waste facilities in Union and Northumberland counties. From my research about (and as a member of) the Anti-“Tire Burner Team” that organized in 2013-14 to defeat a proposed tire incinerator slated for White Deer Township, I learned that many residents believed in their collective success—“protest efficacy”—because the community had organized successfully a decade prior to defeat the Allenwood waste incinerator. Currently, in response to the plastics “chemical recycling” pyrolysis plant proposed for Point Township in Northumberland, community members have organized strongly in opposition. Some echo this same belief in the possibilities of blocking this facility due to the history of success. This group, “Save our Susquehanna”, has joined with a coalition of national environmental groups challenging the fossil fuel industry neoliberal greenwashing of recycling and cooptation of “circular economy” logics. This NIABYism (not in anyone’s backyard) approach today recalls a similar outward connection of the Tire-Burner Team to groups such as the Clean Air Council a decade ago. The Encina company has picked the Susquehanna River Basin as a testing ground for a noxious petrochemical process commercializing plastic waste that has serious, long-term implications for the world’s attempts to limit climate change and with the intent of replicating this process in other countries. Across these three events each separated by a decade, political ecology patterns are visible: economic power relations with/in a rural region, resident environmental motivations and emotions, community conflicts and politics, organizing tactics and national coalition building, and collective memory making.

Corporate Greenwashing, Permitting Processes, and Potential Environmental Impacts of Encina Petrochemical Facility

Amanda Wooden, Professor of Environmental Studies and Sciences, Bucknell University; **Juliette Gaggini**, Undergraduate Student, Bucknell University; **Molly Garrahy**, Undergraduate Student, Bucknell University; **Brady McNamara**, Central Columbia High School; **Deborah Sills**, Associate Professor Environmental Civil & Environmental Engineering, Bucknell University; **Ella Slayton**, Undergraduate Student, Bucknell University; **Kenny Truong**, Undergraduate Student, Bucknell University; **Annalise Velazquez**, Undergraduate Student, Bucknell University

This research team (led by Professors Amanda Wooden and Deborah Sills) investigates potential environmental impacts and corporate claims of the Encina chemical recycling facility proposed for Point Township, Northumberland County. Additionally, researchers are studying the applicable regulatory

policies and permits required for this facility and the ways the chemical and fossil fuels industry have been seeking to change the regulatory structure. The team has used ArcGIS (Geographic Information Systems) to study and visualize potential environmental and social impacts including: proximity to public drinking water systems and private water wells, site flooding potential, railroad chemical transport routes and prior railroad incidents, and proximity within priority watershed locations. The poster will include four-five topics of this ongoing research: what is petrochemical recycling; corporate strategies and greenwashing; regulators, policies and permitting; limitations of applicable policies, and potential environmental social impacts. The team consists of five Bucknell students—majoring in Environmental Studies, Environmental Sciences, Geography, Economics, and Literature—and one student from Central Columbia H.S.



Organizations

Bucknell Student Government: Sustainability Committee

Ella Slayton, Sustainability Committee Chair; **Jenna Galla**, Sustainability Committee House Representative, BSG; **Annalise Velazquez**, Sustainability Committee House Representative, BSG; **Viola Lin**, Sustainability Committee House Representative, BSG; **Ben Leone**, Sustainability Committee Senator, BSG; **Mary Page**, Sustainability Committee Senator, BSG; **Liam Kennedy**, Sustainability Committee Senator, BSG; **Elliot Kilgallen**, Sustainability Committee At Large Member, BSG; **Amaya Becker**, Sustainability Committee At Large Member, BSG

Bucknell Student Government is a body of elected students that are charged with representing the student body in University affairs. The Sustainability Committee is the internal committee that organizes initiatives that strive for environmental change and promote sustainability on the Bucknell campus community and beyond. We specifically promote the ecological health of the campus, fair and equitable societies, and the responsible management of financial resources. In collaboration and communication with our advisor, Dr. Victor Udo, the Bucknell Sustainability Committee aims to bridge the gap between students and the administration, faculty and staff.

Epsilon Eta

Represented by: **Kristie Semanchik**, Co-President; **Molly Garrahy**, President/Service Chair

Epsilon Eta (ENP) has been established as a student-run, environmental and sustainability-focused professional society at Bucknell University. Epsilon Eta works to find leadership, volunteer, and career growth opportunities to build professional relationships in the sustainability field that can help with post-graduate plans. We focus on empowering students to participate in sustainability efforts both on Bucknell's campus and in the surrounding communities. There is no monetary fee for joining, and we welcome any majors, any grades, and any experiences to apply to join!

Poster and Creative Works Judges

A special thanks to the judges for the Sustainability Expo submissions:

Shaunna Barnhart

Director, Place Studies Program, Center for Sustainability & the Environment

Ben Hayes

Director, Watershed Sciences and Engineering, Center for Sustainability & the Environment

Matt Higgins

Faculty Director, Center for Sustainability & the Environment

Claire W. Carlson Chair in Environmental Engineering, Prof. of Civil & Environmental Engineering

BCSE Ambassadors

A special thank you to the cohort of BCSE Ambassadors for providing support to the Sustainability Symposium:

Michael Hardyway '25

Environmental Studies major

Abbey Jacoby '24

Biology and Environmental Science major

Kristie Semanchik '25

Biology and Environmental Science major

Skye Sunderhauf '25

Animal Behavior and Environmental Studies major

Conference Committee

Shaunna Barnhart, Ph.D.

Director, Places Studies Program
Center for Sustainability & the Environment

Janeen Putman

Operations Director, Center for Sustainability & the Environment

Krista Smith

Office Assistant, Center for Sustainability & the Environment

Matt Higgins

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