



From Campus to County

*A Place-Conscious
Orientation to the
Sustainability Issues
and Opportunities of
Ball State University,
Muncie, and Delaware
County*

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Purpose

In coordination with the Ball State Honors College, this project serves as my Honors Thesis Creative Project. Beyond meeting my graduation requirement, this publication acts as a capstone experience for the academic passions I have discovered over my undergraduate career. The intent of this project is to orient students and stakeholders from Ball State University, Muncie, and

Delaware County to a selection of the local sustainability issues and opportunities for awareness, learning, and action within the area. To understand and promote place-consciousness—knowing and respecting one’s surrounding environment and social community—this publication includes relevant, timely examples of sustainability initiatives.

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Introduction

According to the [United States Environmental Protection Agency](#), sustainability is “based on a simple principle: everything we need for our survival and well-being depends, either directly or indirectly, on our natural environment.” In other words, sustainability can be viewed as a three-legged stool standing on the environment, the economy, and society. For the stool to stand, each leg needs to be supported. So, to be sustainable, a place needs to consider its environmental, economic, and social impacts.

For example, consider [Ball State’s Sustainability Statement](#): “We, the Ball State University community, affirm our commitment to protect and enhance the environment through our learning, research, service and administrative operations. We seek to foster a community that sustains ecological systems and educates for environmental awareness, local action, and global thinking. We seek to incorporate environmental principles and environmentally responsible practices as fundamental and integrated components of all BSU operations and programs.”

Further, the United Nations

has a set of [17 Global Sustainable Development Goals](#). The goals “recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.” In summary, to improve sustainability issues, people need to be aware of and educated on the issues, the economy must be suitable and viable for this prioritization, and these pursuits must happen equitably.

Considering sustainability initiatives of Ball State University, Muncie, and Delaware County, this project examines environmental, economic, and social issues relevant to bettering place-conscious awareness, learning, and action. The Ball State section features biodiversity, transparency, and climate change. The Muncie section features homelessness, community resources, and remediation. The Delaware County section features food deserts, alternative farming, and renewable energy. Each topic exemplifies one or more aspects of sustainability: people, planet, and profit.

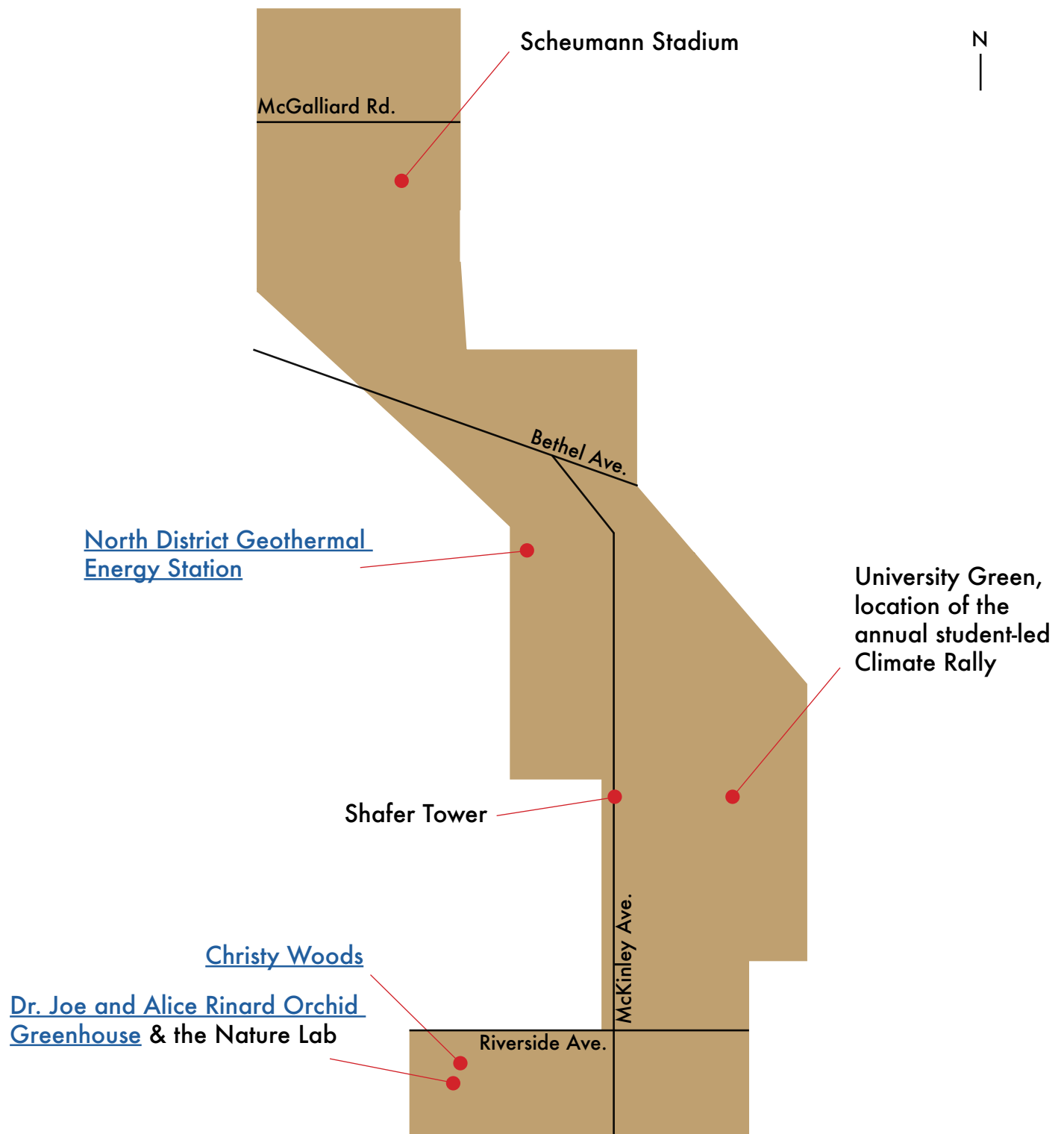


Ball State University

From programs on biodiversity to climate change rallies, the campus is raising environmental awareness

A Northern Red Oak on Riverside Avenue, Ball State University

Ball State University Campus Map



More Than Orchids

Have you ever wanted to observe 25,000 honey bees up close and personal without the risk of being stung? Or visit a tropical climate without leaving Muncie? What about learning of Indiana's natural environment from a classroom that physically opens up to [Christy Woods](#), a 17-acre deciduous forest and tall grass prairie habitat?

With the expansion of the [Dr. Joe and Alice Rinard Orchid Greenhouse](#) and the opening of the Nature Lab in June 2022, all of this and more is possible. Interactive learning opportunities and collaborative programs with organizations such as the [Red-tail Land Conservancy](#) and the [Robert Cooper Audubon Society](#) are enabling Ball State to further their environmental education efforts. Pioneering these efforts is Erica Oliver, the Environmental Education Program Coordinator and Orchid Greenhouse Assistant.

"I'm here as a resource. I'm here to serve the public more than anything else. I try to make it fun. They're not going to learn if they're not having fun," Oliver said.

For K-12 students, Ball State classes, adults, and everyone in between, Oliver gives tours of the greenhouse, organizes specialized programs, and even adjusts her

events to fit in with specific learning objectives for each crowd. Beyond class or group-specific programs, volunteers are always welcome, as well as anyone who just wants to visit and learn something.

"We're here to educate and serve the public, to help them care about the environment they live in and that we depend on. Biodiversity is inextricably linked to these goals," Oliver said.

Opening the Nature Lab demonstrates a commitment to and bolstering of biodiversity, or the variation of genetics, species, and ecosystems, in Indiana. The greenhouse is home to the largest collegiate collection of orchids in the United States with over 2,000 types of orchids. Additionally, the space fosters education on Indiana's wildlife, such as the in-house Eastern box turtles, honey bees, Monarch butterflies, Fowler's toads, and Eastern grey tree frogs.

"The healthier and stronger your habitats, the better your biodiversity. Christy Woods and the prairie are crucial habitats for Indiana flora and fauna. Our location is surrounded by



An orchid at the Rinard Orchid Greenhouse

urban areas, neighborhoods, BSU campus, [and] the hospital, so our location here helps protect the wildlife that need places to live in all of this urban sprawl,” Oliver said.

Some of the programs that emphasize the importance of biodiversity are the “Pollinator Party,” “Cretaceous Crawl,” and “Tropical Discovery,” which all utilize the Nature Lab’s indoor space connected to the Orchid Greenhouse and outdoor space adjacent to Christy Woods.

“Trying to make a welcoming presence [is] what this room is for. I want this to be a public resource more than anything. This is a space to learn about nature. We have the giant windows, we have some of the animals in here, we have plants in here. Here’s the front door. Come on in,” Oliver said.



The Outdoor Nature Lab & Rinard Orchid Greenhouse

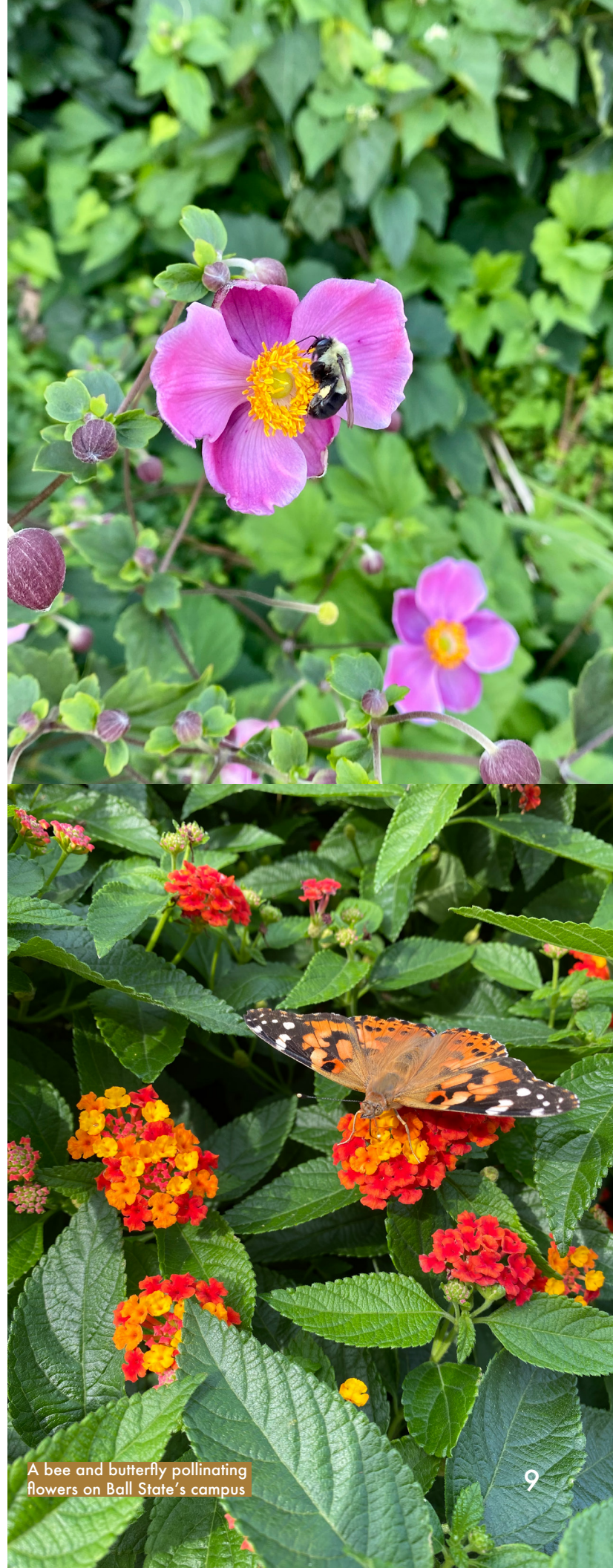
Save the Bees!

Loss of habitat, insecticide usage, and climate change are leading to decreasing numbers of [pollinators](#) in Indiana, including both honeybees and [native bee species](#). Indiana alone has over 430 native bee species, although some of them, such as the rusty-patched bumble bee, have been placed on the endangered, threatened and rare species list. Maintaining healthy pollinator habitats is most important for ensuring crops are being pollinated. Pollinators account for about 35% of global crop production, meaning protecting and enhancing their habitats also protects the global food supply.

So, what species are endangered, threatened, or rare in Delaware County?

Butler's Garter Snake
Indiana Bat
Pirate Wolf Spider
Rusty-patched Bumble Bee
Slippershell Mussel
Spotted Turtle
Turquoise Bluet

Check out the full list [here](#)



A bee and butterfly pollinating flowers on Ball State's campus

Reach for the STARS

Ball State is committed to disclosing its sustainability performance by participating in the self-reporting framework [STARS](#).

What is the STARS self-reporting framework?

“The Sustainability Tracking, Assessment & Rating System (STARS) is a transparent, self-reporting framework for colleges and universities to gauge relative progress toward sustainability. STARS encompasses long-term sustainability goals for already high-achieving institutions as well as entry points of recognition for institutions that are taking first steps toward sustainability,” ([STARS](#), *Ball State University*).

The framework analyzes multiple categories of higher-learning institutions, in regards to sustainability, such as academics, engagement, operations, planning and administration, and innovation and leadership. Within these main categories, there are 88 subcategories Ball State reports on. Notably, Ball State was recognized as a “[top performer](#)” in Research in 2022 and has had multiple gold and silver [ratings](#) over the years. Importantly for students, part of this report identifies [University courses](#), which emphasize sustainability

content.

By understanding the STARS report, students and staff can encourage further progress in low-performing categories.

Why is it important for Ball State to participate in STARS?

It “helps [the] campus community to account success in achieving climate neutrality, amplifies the fact that this is a community challenge, [and] demonstrates the balance of academic and business affairs in meeting that goal,” Robert Koester, Chair of Council on the Environment, said.

What is the “climate neutrality” goal?

[Climate neutrality](#) means a state of net zero greenhouse gas emissions in all operations, achieved through balancing total emissions into and total absorption of carbon from the atmosphere.

According to Julie Hopwood, Associate Vice President for Business and Auxiliary Services at Ball State University, “In October 2015, the Ball State University President’s Sustainability Working Group (PSWG) was charged with researching, reviewing, and determining whether to make a recommendation to revise, as appropriate and feasible, the Ball State University Climate Action Plan and to discern the capacity and strategy for revising the goal of Ball State University carbon neutrality from 2050 to, potentially, 2030.”

Then, “in February 2016, the

Ball State University PSWG recommended for further consideration revising the Ball State University goal of carbon neutrality from 2050 to 2030, consistent with financial viability and practical implementation, and by integrating sustainability best practices through: continued emission performance improvement [and] continued Ball State University carbon reduction transaction. To date, the Ball State University's geothermal energy system has reduced Ball State University's carbon footprint by 50%. Annual Ball State University STARS reporting provides the structure for continuous measurement, tracking, and reporting of our substantial progress," Hopwood said.

How does the STARS report enhance Ball State's commitment to sustainability?

"Ball State University has committed to an annual STARS Report submission, as opposed to a three-year reporting cycle, to intentionally integrate a sustainability mindset into all day-to-day operations and to promote regular and continuous sustainability measuring, tracking and reporting," Hopwood said.

Importantly, the STARS report has fostered intentional effort to implement sustainability into Ball State's operations, academics, and facilities, resulting in increased transparency of the University's functions overall.



Fall foliage at the University Green

Say It Loud, Say It Proud

On Sept. 23, 2022, students gathered at the University Green with posters and a microphone in hand. Hosted by the Student Government Association (SGA), this year's annual climate rally brought together the Natural Resources Club, College Democrats, Green Action Team, and anyone nearby who wanted to stop in, listen, and learn.

"It is important for SGA to host a climate rally because students care about campus [and the] climate. We are the voice [of] the students on Ball State's campus, and we value true representation. Students have shown, time and time again, that the environment matters to them," Sarah Owens, Chair of the Community and Environmental Affairs Committee of SGA, said.

While the rally had only a few dozen participants, speakers were passionate about their issues, which varied greatly from problems of [coal ash](#) ponds in Indiana, to the importance of voting, to the concept of plant blindness.

Jillian Cieslik, President of the Natural Resources Club, presented the idea of "plant blindness" or the tendency for people to ignore plants. Cieslik shared the gravity of this issue is beyond simply not recognizing plants, but not understanding or



Hand-made posters at the climate rally & Jillian Cieslik presenting

putting value on plant diversity and ecosystem sustainability, importantly noting that plants store carbon.

[Carbon sinks](#), such as plants and forests, are crucial for keeping the earth's carbon levels stable.

"Speakers encouraged each other to be environmentally conscious, informed of on and off-campus resources, and encouraged good practices such as voting. This is a simple and free way for students to learn of ways to become involved and to find others who are looking to do the same," Ciera Boyes, Vice President of Green Action Team, said.

"Students have shown, time and time again, that the environment matters to them."

Specific issues at Ball State were also discussed, including the [recycling program](#), the [geothermal energy system](#), and single-use plastic waste in the dining halls. According to Owens, one of the most prevalent issues for Ball State students to understand is how to properly recycle. To provide further knowledge on this topic to students, Owens hopes to include speakers from the Muncie Sanitary District, Ball State's recycling services, and local environmental groups at next year's annual student climate rally.

"The Community and Environmental Affairs Committee is making students more aware of these issues through events like the climate rally. We work with [Ball State] administration to fix the issues, but we do our best work to make students aware of them as well," Owens said.



Students listen to Sarah Owens' speech

To Recycle or Not to Recycle

Reducing and reusing should come to mind before recycling, as these actions are the most optimal for sustainability. [All three options](#) save energy, reduce raw material use, decrease emissions, and ultimately, mitigate climate change impacts. Reducing means to decrease the amount of goods consumed and resources used. Reusing means to find alternative purposes for goods before throwing them out. Recycling means breaking down used material to be remade into new material. If items cannot be reduced, reused, or recycled, they end up as part of the waste stream and, eventually, go to a landfill.

Landfills are responsible for 17% of the United States' total [methane emissions](#). By reducing how much waste ends up in a landfill, greenhouse gas emissions can be drastically reduced. It's important to know what can be recycled because if non-recyclable materials are thrown into the wrong bin, out of hope of them being recyclable, or the process known as "[wish cycling](#)," the actual recyclables can be contaminated and end up in landfills.

So, what should I put in the recycling bin?



Aluminum
Steel
Glass
Plastics #1-2
Paper
Cardboard
Magazines



Plastics #3-7
Styrofoam
Plastic grocery bags
K-cups
Items with food residue
Disposable coffee cups
Ziploc bags



Recycling and waste bins at North Dining

On-Campus Opportunities for Environmental Awareness:

Community and Environmental Affairs Committee, Student Government Association

"The purpose of the Committee is to work towards a greener, more sustainable campus. The primary goal of this committee in the 22-23 academic year is the community garden. One main concern is making dining and other University offices more sustainable. I would love for the student body to know that we want to hear your voice! Your opinion on the campus environment matters to us, and all of us want [to] start working on what you need to see done!"

- Sarah Owens, Chair

Follow Student Government and the Community Garden Project on Instagram

[@bsustudentgov](#)

[@bsucommunitygarden](#)

Council on the Environment

"The Council on the Environment ([COTE](#)) provides leadership for initiatives at Ball State University and in the surrounding community that promote the sustainable use of natural resources and the protection of ecological systems that sustain life."

- COTE Mission Statement

Emerging Green Builders

"Our Chapter of the USGBC Emerging Green Builders strives to promote green design principles throughout the College of Architecture & Planning (CAP), Ball State University, the Muncie community, and the State of Indiana. Our

multidisciplinary organization reaches a wide variety of students, with majors inside and outside CAP, who have a passion for sustainability. We have the goal of preparing our members for becoming the future leaders in the design and green building industry, through community outreach, guest speakers, and events focused on sustainability. Our organization explores sustainability through social and environmental justice in design."

- Nathan Ritz, President

Follow them on Instagram [@usgbcbsu](#)

Green Action Team

"GAT is a student organization which acts to guide our ever-changing community toward a collective ecological consciousness through peer education and sustainable action. The mission and actions of GAT represent the greater good in Ball State students and residents of Muncie by inviting everyone to become involved in their environment and make conscious decisions for the betterment of our planet."

- Ciera Boyes, Vice President

Follow them on Instagram [@bsu_gat](#)

Natural Resources Club

"Students should join because of the opportunities to engage and give back to the surrounding community. We participate in many volunteer events that connect our members with the Muncie community and various environmental organizations in the area. [Members] learn about prospective jobs in conservation as well as how to make a difference in the climate crisis on a daily basis through simple actions. We strive to build a community centered around a shared love for our Earth and a respect for all those who live on it."

- Jillian Cieslik, President

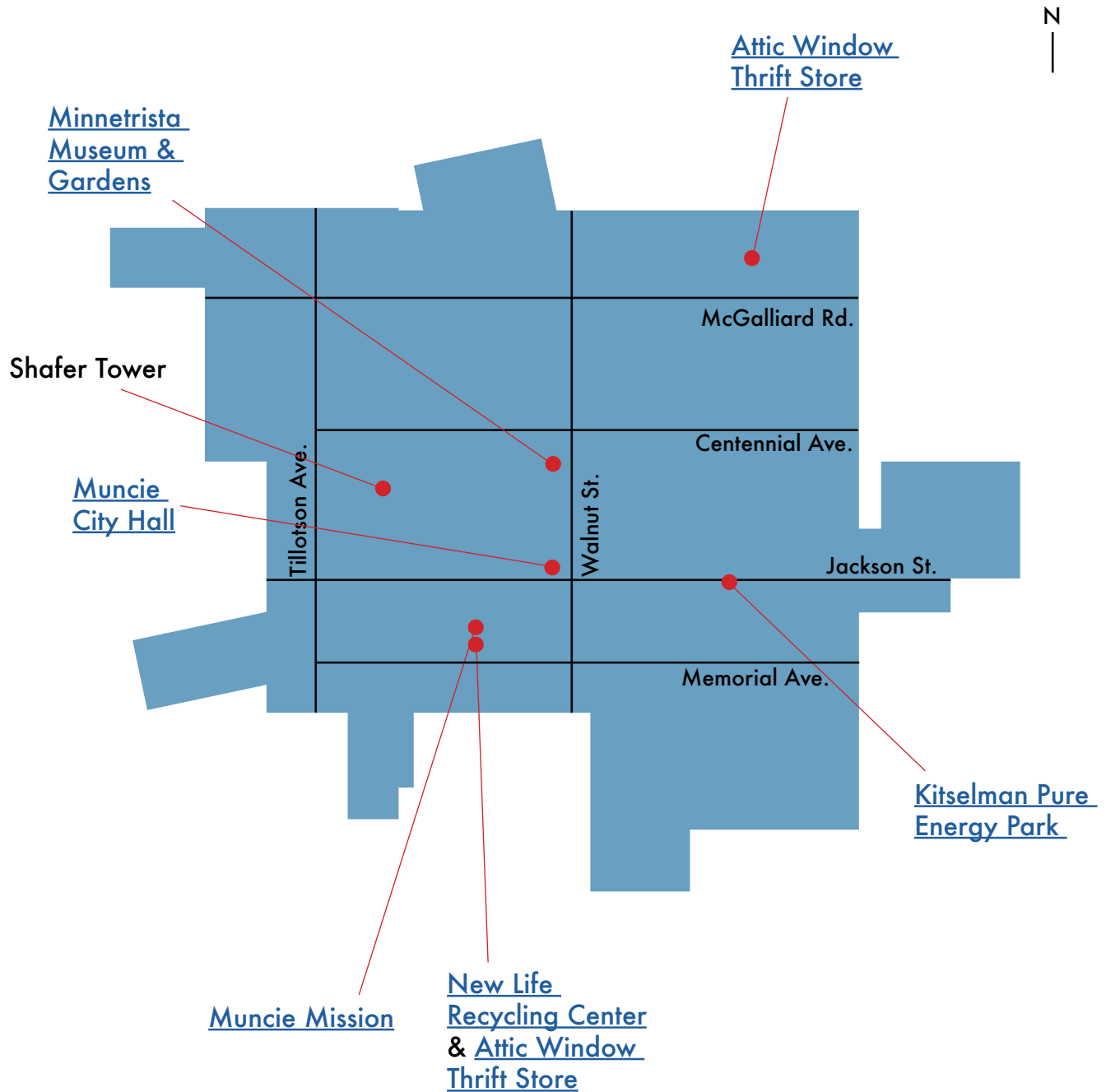
Follow them on Instagram [@bsunremclub](#)



Muncie

From sustainable design to brownfield remediation, the city is exemplifying environmental learning

Muncie City Map



It Takes a Village

Struggles of homelessness are a prevalent concern in Indiana, with 8.4 persons facing homelessness for every 10,000 people, according to the [National Alliance to End Homelessness](#). To help combat this issue in Muncie, a Ball State immersive-learning course partnered with Muncie City's Department of Community Development to plan the Tiny House Village Project. The project enables students to study the interrelated elements of ecological design, landscape architecture, social justice, and community development to propose a plan that considers both the environment and people in need of secure housing.

The planned site, funded by a federal grant, is not designed to have long-term residences, but function as transitional housing. "This will be somewhere that somebody can place themselves, make a home, move forward, and become self-supportive," Dr. Sarah Keogh, Assistant Teaching Professor of Architecture, said.

Over summer 2022, Dr. Keogh worked with a group of six students to design the tiny homes. During fall 2022, 18 students enrolled in the course to continue the designing and planning of the project. Working in smaller specialized teams, students developed detailed designs of the tiny

home units, the community building, and the site itself.

"Sustainability has all kinds of meanings and frameworks of approach that you can take. Depending on the stage of the project, we're looking at sustainability in different ways. This summer, it very much had to do with accessibility to those who don't have money, how can we supply safety and security, and a place to be safe while you work toward getting yourself out of a situation of homelessness," Dr. Keogh said.

"There's a balancing of the economic sustainability and the environmental sustainability."

The location of the proposed site is still under discussion, but it most likely will be on Eighth Street south of downtown Muncie. According to Dr. Keogh, environmental considerations for site development include "soil studies and plant studies. Looking at invasive species and what trees can be saved, and coming up with a site design that addresses landscape architecture standards, sustainability metrics [like] permeable pavers, [and] native species," Dr. Keogh said.

With sustainability in mind, perimeter foundations rather than slab foundations will be used to save concrete and the frameworks

of the homes will use local, recycled materials such as scrap wood and wood from the removal of plants on the site. The design is focused on reducing the total amount of hardscape building or non-natural elements like walkways and patios.

"There's a balancing of the economic sustainability and the environmental sustainability. We've been working to reduce the energy requirement of this, so we can be fully self-supportive through solar power. We're paying attention to water runoff [and] permeable pavers. We are going to take advantage of what's there already as much as possible," Dr. Keogh said.

The site is planned to include a total of 60 ADA-compliant (Americans with Disabilities Act) accessible housing units, with both single and double units measuring 10 ft x 14 ft and 10 ft x 16 ft, respectively. The site will also include a community building with a mailroom, a library, a job center, a kennel, and a space to be used for meetings or counseling.

"It's an awesome project. I have amazing students. We're pulling in a lot of people who are helping out or volunteering time, so that's also amazing. I can't wait for it to be built," Dr. Keogh said.



A rendering of the Tiny House Village, sourced from Dr. Keogh

Close to Home

Bob Scott, Vice President of Development at [Muncie Mission](#), describes the causes of homelessness as either “those that result in a sudden, unexpected, and often temporary loss of housing [or] those that lead to chronic homelessness.”

Causes of temporary homelessness

Fire or natural disaster
Unexpected job loss
High-cost medical issues
Partner violence/abuse

Causes of chronic homelessness

Poverty
Mental illness
Substance abuse/addiction
Disabilities
Chronic health issues
Low-wage employment with lack of affordable housing

Delaware County had about 126 individuals counted as homeless in January 2022, according to the latest [Point in Time](#) data collected by the United States Department of Housing and Urban Development. One group working to decrease this number is Muncie Mission Ministries, a faith-based agency that provides resources and services to Muncie and East Central Indiana’s housing-insecure population. The agency provides men, women, and family services such as emergency shelter, recovery, transitional living, a food pantry, and community lunches.

So, how can I help?

Individuals can get involved with this cause by donating items on Muncie Mission’s [Needs List](#), shopping at [Attic Window Thrift Stores](#), or donating used items to the [New Life Center](#).



Attic Window Thrift Store on Broadway Ave. & New Life Recycling Center on Memorial Dr.

Muncie in Action

The [Muncie Action Plan](#) (MAP), originally published in 2010, is planning for the city's future as "a community which respects diversity, manages resources effectively and efficiently, and works together to provide an attractive, desirable place for individuals, families, and businesses."

MAP includes five task forces: Linking Learning, Health and Prosperity, Fostering Collaboration, Strengthening Pride and Image, Creating Attractive and Desirable Places, and Managing Community Resources. Each task force works with community leaders, volunteers, and affiliate programs to accomplish their initiatives and achieve specific goals. Task Force 5, Managing Community Resources, is led by Marta Moody, Executive Director of the Delaware-Muncie Metropolitan Plan Commission.

The mission of Task Force 5 is "to protect natural and cultural resources, improve the community's essential facilities and infrastructure, and promote environmentally sustainable practices" is being fulfilled. "I report out on what's been done in terms of the different action steps. A lot of times I'm reporting on what other agencies have been doing," Moody said. Task Force 5

works with the [East Central Indiana Regional Planning District](#), [Central Indiana Regional Transportation Authority](#), Ball State immersive learning courses, and other local programs to accomplish their action steps.

Some of the proposed action steps of Task Force 5 include creating a brownfields redevelopment program, implementing sustainable design throughout the city, instituting bike-friendly community programs, and creating a Muncie Energy Office and advisory committee. Relative to the goal of creating an energy office and advisory committee within the city's government, the Planet Muncie Committee was created in 2020 with Jason Donati as the leader. A current



Muncie City Hall

goal of the Committee is creating a Climate Action Plan for Muncie. “We haven’t finalized it yet, but we’re getting very close. Once we have a good final document, we’ll present that to city council, and hopefully they’ll adopt it as the Climate Action Plan for the city,” Moody said.

“The starting point for the Climate Action Plan was [a] greenhouse gas inventory. It was clear that transportation is the biggest generator of greenhouse gas emissions in our area, higher than the national average,” Moody said. The climate plan will include action items of improving bicycle and pedestrian facilities and transit, building a robust tree canopy for the city in coordination with Muncie Mayor Dan Ridenour’s [‘1000 Trees in 1000 Days’](#) Project, and implementing alternative energy sources such as solar. While there isn’t a deadline for completing the Climate Action Plan, Moody is hopeful it could be done by the end of 2022.

“Students should know that Muncie is doing a lot to help protect our environment. We’ve hosted White River cleanups for many years, and we are very active in doing things more efficiently and reducing our carbon footprint,” Donati said.



Brownfield to Beautiful

One of the action items of Task Force 5 is to “Create a Brownfields Redevelopment Program.” This item is essential to beautifying Muncie as there are roughly [68 brownfields](#) in the area, according to *The Star Press*, a local Muncie newspaper. A [brownfield](#) is an area of land previously used for industrial activity that needs to be remediated prior to new development due to confirmed or potential environmental contamination.

In Muncie, brownfield redevelopment efforts have been mobilized by the East Central Indiana Regional Planning District and have been supported by MAP. When a property has been cleared for development, a request for proposal (RFP), or a formal bid, is posted to private businesses to develop on the site.

One of the most successful remediation projects in Muncie is the [Kitselman Pure Energy Park](#), formerly the Indiana Steel and Wire plant on the east side of town on Jackson Street. “It is a trail project. Phase one involved the reuse, repainting, and relighting of a historic metal bridge that was placed over the river. Phase two was extending the [White River Greenway](#) from the [Craddock Wetland Preserve](#) [to connect] to the new bridge. Right now, we’re working on Phase three that will realign the [Cardinal Greenway](#) and connect to

the west side of the bridge, and [continue] south [on the greenway] to Richmond. [The] project will involve the reuse of [two] brownfields. That is a huge success, I think,” Marta Moody said.



Kitselman Pure Energy Park

Local Opportunities for Environmental Learning:

Bike Muncie

"Bike Muncie is the outreach and education program of the Muncie Bicycle-Pedestrian Advisory Committee. Our mission is to promote increased use of cycling as a means of transportation and recreation, and also to help people be more safe when riding. We also want to spread the word on how cycling is a way to achieve a more healthy lifestyle and have less impact on the environment."

- [Bike Muncie, home page](#)

Minnetrista Museum & Gardens

"Built on the unique legacy of the Ball family and company, Minnetrista works to nurture a thriving community that takes pride in its accomplishments and strives for a brighter future. Located on the White River in the middle of Muncie, Indiana, our 40-acre museum and gardens is a community gem. Whether exploring our exhibits and historic homes, or meandering our trails, visitors to our site find a moment outside of the everyday where discovery, imagination, and learning are core. Our calendar full of educational programs, workshops, and community events is ever-changing as we strive to meet our communities' interests and needs. Whether you are a first-time visitor to Muncie or a life-long resident, there is something for you at Minnetrista. In everything we do, we hold our mission central: connecting people, encouraging engagement, and improving our community."

- [Minnetrista, who we are](#)

Muncie-Delaware Clean & Beautiful

"Concerned citizens formed Muncie-Delaware Clean & Beautiful in 1977 with a primary purpose to engage in beautification activities that enhance the appearance of Muncie and Delaware County, as well as to educate the public about proper trash disposal and the sources, prevention, and reduction of litter. Our major program areas include beautification, clean-ups, community gardening, and environmental education."

- [Muncie-Delaware Clean & Beautiful, home page](#)

"The White River Clean-Up happens each September and is part of the White River Festival, a statewide public service stretching along a majority of the White River. Volunteers walk the bank, river, and land where possible, removing debris from and around the river. When that is not possible, volunteers use canoes to navigate through the water, filling them up along the way with the debris they find."

- [Muncie-Delaware Clean & Beautiful, White River Clean-Up](#)

ScrapCycle

"We're making a difference, one bucket of scraps at a time! We've been dreaming up ways on how to help people take responsibility for their waste. We've made it easy to take a few extra seconds out of your day and know that you're making a good decision for your planet, your kids and future generations. We want you to participate and make the small part of the world you're in greener. Our plans for the present are Muncie, Yorktown and the surrounding areas. The future though... we want all of Indiana to be participating in composting and we're going to make it as easy as possible for others to join."

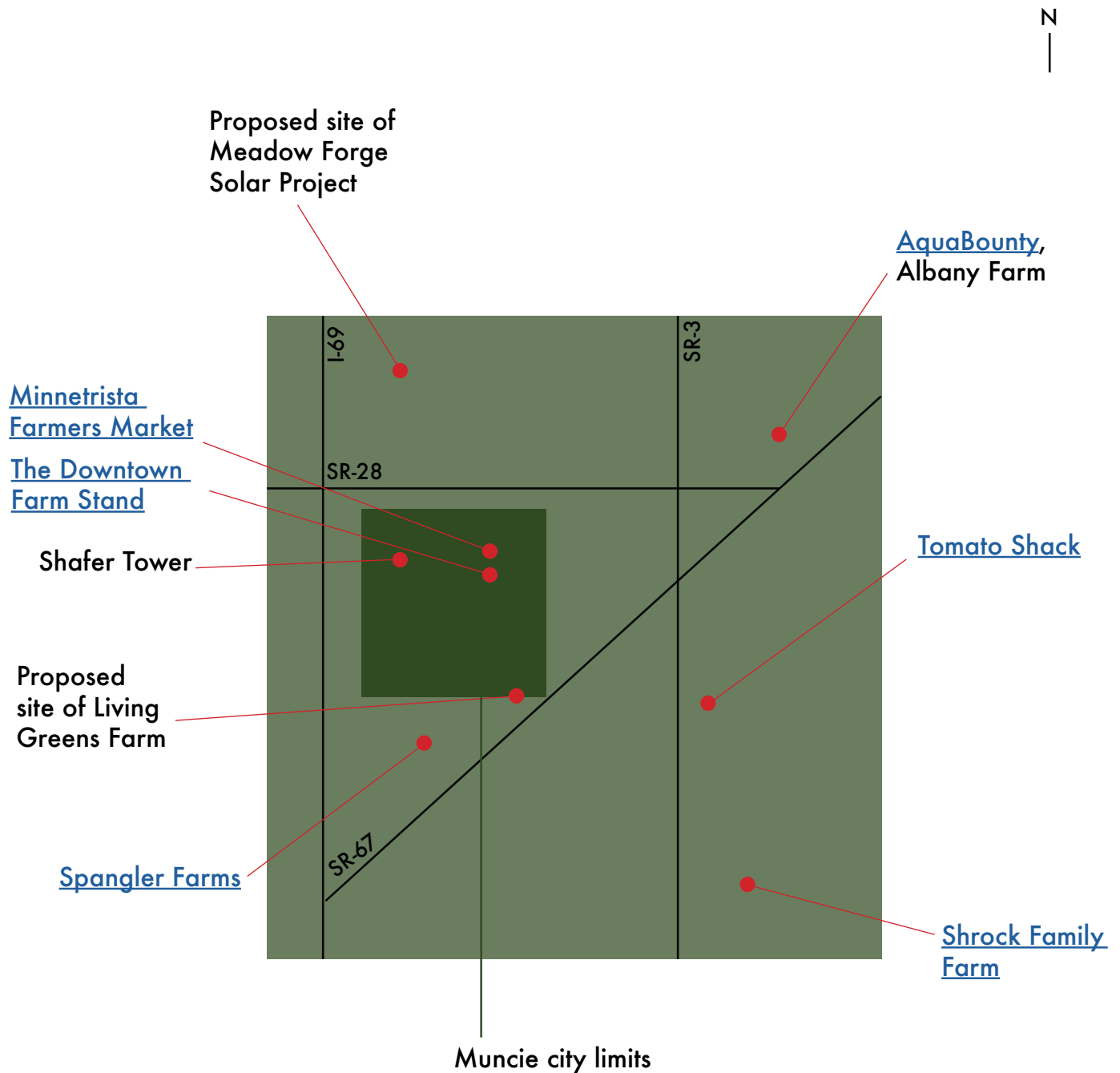
- [ScrapCycle, Hello](#)



Delaware County

*From food hubs to
debates on solar
energy, the county is
inspiring environmental
action*

Delaware County Map



"Grown Here, Not Flown Here"

When people think of Indiana, usually the first association that comes to mind is corn. Even though Indiana is an agricultural state, 98% of the fruits and vegetables consumed in Indiana are not grown in-state, according to the [Northeast Indiana Local Food Network](#). Supporting small in-state farms is important to combat climate change, boost the local economy, and maintain the diversity of crops. One organization fulfilling these goals is the [Muncie Food Hub Partnership](#) (MFHP), a collaborative network of farmers, distributors, and consumers.

"The mission of the food hub is to supply our local communities with fresh locally grown produce, and by doing that, helping out our communities economically, socially, and environmentally. We operate on a community-based level and try to incorporate as many partners throughout the community as we can," Emily Hayes, Program Coordinator of the MFHP, said.

Some of the partners that are involved with the MFHP include local farms within and nearby Delaware County, such as [Spangler Farms](#),



MFHP mobile farmers market on Adams St. & at Maring-Hunt Library

[Shrock Family Farm](#), [Christopher Farm](#), and [Tomato Shack](#). Once produce is collected and aggregated from these farms, mobile markets are held weekly at Ivy Tech and Open Door Health in Downtown Muncie and at the Maring-Hunt Library just south of downtown. The MFHP also donates \$150 of produce weekly to local childcare facilities, after-school programs, and food pantries, such as the Ross Community Center, Muncie Head Start, and Huffer Memorial Children's Center while the market is in season. This donation and mobile market system is vital to Muncie since certain areas within the city are considered to be food deserts.

"A food desert is an area where there isn't local access to food products, especially locally grown food products. There's a certain mileage radius that you have to be within walking distance or driving distance of a grocery store, somewhere that sells food products, in order to not be in a food desert," Hayes said.

According to the [USDA's Economic Research Service](#), some areas of Muncie have low incomes and also face low accessibility to food stores. Additionally, living in a food desert increases chances of health-related issues such as obesity, diabetes, and malnutrition. To further counter this inequity, the MFHP is continuously applying for grants to expand the partnership, and has inspired an immersive learning course at Ball State, "Sustainable Food

System Development." Students in this course volunteer at the mobile markets, pick up produce from the local farms, and study ways to make food systems more community-based.

"People don't realize how important of a solution local producing and local buying really is."

"People don't realize how important of a solution local producing and local buying really is. If we all started purchasing local produce [and] started eating more seasonally, that's better for our local economy. It's better for our local environment. It's better for our communities. [MFHP tries] to find local community-based sustainable solutions to food insecurity, and we find the way to do that is by staying local and utilizing all the resources we have within our community that are being overlooked," Hayes said.



MFHP mobile farmers market on Adams St.

Staying in Season

A major benefit of the MFHP is that they only sell produce that is in-season at local farms. Buying in-season not only means fresher and tastier produce, but also reduces the amount of time and energy it takes to get from farm to table. Produce shipped from other states and countries during the off-season creates a much larger carbon footprint than in-season produce bought locally due to the embodied energy sum. To offset these emissions, consider canning or freezing in-season produce to use during the off-season. Check out the [Minnetrista Farmers Market](#) and [The Downtown Farm Stand](#) for in-season local produce in Muncie.

So, what's in-season in Delaware County?

<i>April-September</i>	<i>July-November</i>
Blueberries	Pumpkins
	Sweet Corn
<i>April-October</i>	Apples
Cabbage	Squash
Peppers	
Jalapenos	<i>August-September</i>
	Pears
<i>May-June</i>	Plums
Asparagus	<i>August-October</i>
Strawberries	Tomatoes
<i>July-August</i>	
Peaches	
<i>July-October</i>	
Cucumbers	
Green Beans	



MFHP mobile farmers market on Adams St.

Salmon & Lettuce & Basil, Oh My!

Indiana is the nation's tenth-largest farming state with the top five commodities being corn, soybeans, meat animals, poultry and eggs, and dairy, according to the [Indiana State Department of Agriculture](#). However, with such extensive conventional agricultural practices comes serious environmental degradations, especially during a time of climate change.

Not only does conventional farming use immense amounts of water and land, but with rising greenhouse gas emissions and changing precipitation and temperature patterns, conventional farming may not be enough. In a [Purdue University](#) study, it was found that warming temperatures:

- have caused corn yields to decrease over the last decade;
- can increase weed, pest, and disease pressure on crops;
- can increase rates of soil organic matter decomposition;
- can reduce infiltration and soil water holding capacity;
- can increase releases of carbon

dioxide and nitrogen gas into the atmosphere.

With consideration of how farming is inevitably going to be impacted by a changing planet, two companies, [AquaBounty](#) and [Living Greens Farm](#), are doing things a bit differently. Land-based aquaculture (the cultivation of aquatic organisms in a controlled environment) and vertical farming (the process of growing crops vertically indoors) offer solutions to some of the problems conventional farming faces. These alternative farming methods create a year-round season for production.

"At AquaBounty, we believe we are a leader in land-based aquaculture leveraging decades of technology expertise to deliver disruptive solutions that address food insecurity and climate change issues. We are committed to feeding the world efficiently, sustainably, and profitably," David Conley, Director of Corporate Communications at AquaBounty, said.

One of AquaBounty's farms is located in Albany, Indiana. The 122,000 sq. ft farm is capable of producing 1,200 metric tons of salmon each year. At AquaBounty, they are dedicated to "improving human health, positively impacting climate change, conserving natural resources, and protecting our precious marine ecosystem."

"We recycle over 95% of the water using recirculating aquaculture system (RAS) technology and treat our wastewater before discharging it

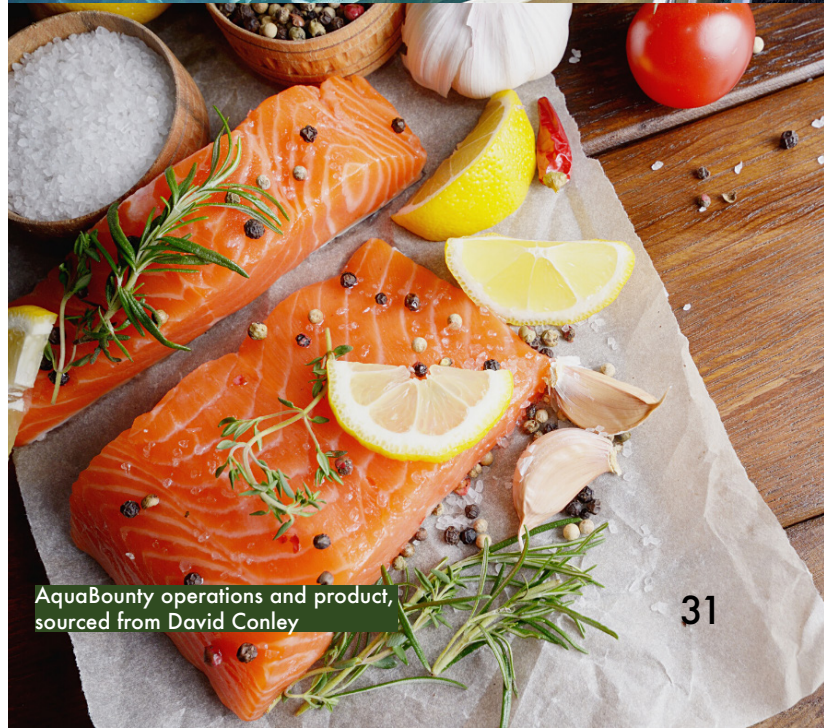
to the environment. All of these measures enable us to use resources wisely while reducing our environmental impact. Our salmon grow from egg to market size in 18-20 months while using 25% less feed than other farmed salmon. We produce more with less. By locating our farms close to major consumer markets, we reduce our transportation carbon footprint significantly, when compared to flying farmed salmon from Norway or Chile to the [United States] market. As a result, our salmon are fresher and have a longer shelf life, which reduces food waste,” Conley said.

AquaBounty also recycles waste from the facility for local farmers to use as fertilizer. “We work with crop farmers to help them reduce their fertilizer needs by supplying them with liquid fish manure. This liquid manure is composed of fish feces, uneaten fish feed, and wastewater from the water filtration process. We currently dispose of all the liquid fish manure produced each month,” Conley said.

In addition to aquaculture, Delaware County will soon support a vertical farming initiative in early 2023. Living Greens Farm uses aeroponics technology (the process of growing plants without soil) to grow produce such as lettuce, basil, and microgreens in an indoor farm. According to the [Indy Star](#), the facility coming to Muncie will be 200,000 sq. ft, equivalent to just under five acres, but capable of producing the same

amount of 200 land acres. This technology is said to use no herbicides or pesticides, 95% less water, 300x less land, and 95% less carbon than traditional farming.

While alternative farming solutions are relatively new, especially to agricultural counties such as Delaware, they offer promising techniques and opportunities to better the environment and secure the food supply.



AquaBounty operations and product, sourced from David Conley

Here Comes the Sun

It's no secret that the combustion of coal and other fossil fuels emit greenhouse gases that perpetuate climate change, but transitioning to renewable energy sources, like solar and wind, can be a challenge for small communities. Indiana is one of the top coal consumers in the nation, ranking third after Texas and Missouri with 33 million tons produced in 2021; the majority of this consumption was for electric power generation, according to the [U.S. Energy Information Administration](#).

Counteracting this state-wide reliance on coal, two solar farm projects, the Meadow Forge solar project in Gaston and a smaller project in Albany, are proposed to utilize farmland in Delaware County; however, this proposal is causing debate between community members.

"Very few are opposed to solar energy, just large-scale projects on high quality farm ground or within view of their properties. People who are potentially surrounded by solar panels are concerned that solar development will lower the property values in the area, making it harder to get a fair price for their homes when they choose to sell," John Taylor, member of the Delaware County Solar Ordinance Study Committee, said.

In response to these concerns, the [Delaware County Commissioners](#) placed a one-year [moratorium](#) on solar farm projects in February 2022, meaning the policy will be reassessed in early 2023.

"It has to be about us trying to make a better future for all of us, for today and for many years to come."

"Before placing a moratorium, the commission voted to make solar developments a special use rather than an accepted use, so there would be a permit required. The commissioners will now have to grant or deny each proposal individually. The Solar Ordinance Study Committee is working to make the new ordinance fair to all involved while still creating opportunities for solar development within Delaware County. Ultimately, though, it is up to the commissioners to decide," Taylor said.

Despite property value concerns, benefits of solar farms include increased tax revenues, creation of jobs, lowering greenhouse gas emissions, and decreased reliance on fossil fuels. "The global economy is moving toward more sustainable practices, including energy generation. It makes sense that some of that transition should be taking place in every community. I want Delaware County to allow solar

farm developments in a way that takes care of all our citizens. It's a tight needle to thread, but it should be possible," Taylor said.

The push to establish solar projects comes from not only a local or state level, but a global standpoint. A major problem in Indiana is [coal ash](#), the material left after burning coal to generate electricity that contaminates Lake Michigan and Indiana rivers. Reliance on coal expands from Indiana to the [Appalachian Mountain](#) region in the Eastern United States to the world's most coal-consuming countries, [China and India](#).

"Many people have been waiting decades for the opportunity to replace coal, oil, and natural gas with clean energy sources. Now that it is affordable, it seems to me that we must find a way to make it work. That includes giving fair treatment to the people who will live next to these renewable energy projects as well as the people elsewhere who are harmed every day we maintain the status quo. This is not an us vs them problem. It has to be about us trying to make a better future for all of us, for today and for many years to come," Taylor said.



The Health Professions Building featuring energy-efficient windows and rooftop solar panels, sourced from Ball State marketing

Regional Opportunities for Environmental Action:

Cardinal Greenways

"Cardinal Greenways will provide award-winning trails, bikeways, waterways, and pedestrian-friendly streets throughout East Central Indiana. Our region will be known for its access to natural surroundings, including the scenic White River, its enhanced connectivity between destinations, and its emphasis on healthy lifestyles through well-maintained facilities and community partnerships."

[- Cardinal Greenways, Vision](#)

Mounds Greenway

"The Mounds Greenway is part of a larger nationwide movement that seeks to improve quality of place, connect people and places, and restore our relationship to nature and outdoor recreation, along river and rail corridors in particular. Our vision for the Mounds Greenway looks like this: Conserve the free-flowing West Fork of the White River and its floodplain forests, wetlands and other natural communities by creating a high quality linear park following the river. Conserve and enhance the historic and cultural resources in the river valley. Connect trails in Muncie and Anderson and build a regional recreational network that eventually will stretch throughout east central Indiana, and to central Indiana via a greenway extension along the White River to Indianapolis. Create economic opportunity by enhancing the region's quality of place and stimulating entrepreneurial investment."

[- Hoosier Environmental Council, Mounds Greenway, The Movement & Vision](#)

Prairie Creek Reservoir

"This beautiful park is located approximately five miles just southeast of Muncie. The reservoir and park area boasts 3.3 miles of aquatic recreation and more than 750 land acres of natural landscape. We offer numerous activities for you, friends and family to enjoy! Some of the wide array of activities we offer include boating, swimming, fishing, camping, hiking/biking trails, ATV trails, and horseback riding trails."

[- City of Muncie, Prairie Creek Reservoir](#)

Red-tail Land Conservancy

"Red-tail Land Conservancy's mission is to preserve, protect, and restore natural areas and farm land in east central Indiana while increasing awareness of our natural heritage. By strategically preserving and restoring critical forests, prairies, wetlands, and waterways, Red-tail Land Conservancy plans for a future where the natural beauty and healthy habitats of east central Indiana will exist for generations to come. Land preserved by Red-tail is protected from development forever."

[- Red-tail Land Conservancy, Mission](#)

Robert Cooper Audubon Society

"Our goals are to protect and enhance the quality of our natural environment; educate our members and others about the natural world and the special relationship that humans have with it; serve our members by providing educational programs, field trip activities, and other programs of interest; and to advance the goals and activities of the National Audubon Society. Put simply, we join with one another in enjoying, learning about, and protecting our natural surroundings, especially the birds that share it with us."

[- Robert Cooper Audubon Society, About](#)

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