How Climate Change Is Messing with Monroe County

By Susan M. Brackney
Photography by Rodney Margison

From a lock of baby hair to stacks of old report cards, the detritus of my childhood is well-preserved. My sentimental parents even kept the pint-sized cross-country skis I used as a 6-year-old. Each ski is about as substantial as a county fair yardstick, but they made my mid-’70s winters magical.

Back then, my brother and I skied the gentle slopes of the local golf course with my father. Sometimes, we’d even make a special trip to ski in Brown County State Park. I also recall making lazy loops with my ice skates on frozen ponds as older neighborhood kids played hockey nearby.

In a recent Herald-Times guest column, self-described old-timer Dan Combs likewise waxed nostalgic about colder winters past. “During the winter of 1962–63, there were 13 zero-degree or lower nights,” he writes. “In the winter of 1963–64, there were eight below-zero nights in December alone. In the ’60s, it was common for Lake Monroe to freeze. Ice fishing was a thing.”

These days, those winter activities seem completely out of reach. The culprit is climate change, and its impact on our personal lives reaches well beyond the dearth of good skiing. Whether we realize it or not, climate change has already begun to influence what we eat, how we feel, how we spend our time, and even how long some of us will live.
Indiana’s past and future climate

Of course, you don’t have to buy into the notion of climate change to recognize that Indiana’s seasons aren’t quite what they used to be. But, if you hope to understand why we’re already seeing wetter springs, hotter summers, less snow in the winter, and more numerous and extreme weather events, maintaining even a grudging openness to the reality of climate change—and our contribution to it—certainly helps.

In late 2018, the Intergovernmental Panel on Climate Change issued a special report stating that human activity has not only caused a 1.8ºF rise in global temperatures, but, if left unchecked, human activity will continue to boost warming by up to 2.7ºF globally between 2030 and 2050. That doesn’t mean the planet will warm uniformly; rather, temperatures are likely to increase more over land masses than over bodies of water. “It definitely has gotten warmer in winter [in Indiana],” says Indiana University Department of Geography professor Scott Robeson. “And that’s actually happening all over the Northern Hemisphere.”

Robeson also has served on the Indiana Climate Change Impacts Assessment Climate Working Group for the Purdue Climate Change Research Center (PCCRC). In March 2018, the group issued a series of comprehensive reports, including Indiana’s Past & Future Climate, which combined real-world weather data with mathematical modeling for medium and high greenhouse gas emissions levels.

Under their “medium” model, we were able to project that by mid-century, “with significantly more heavy rainfall will be replaced with rain—and potentially more than 60 years, snowfall of more than two inches in southern Indiana will be rare. The number of cold and frost days are also expected to decline sharply.”

Dangers to our health

With the increase in temperature, heavy rainfall will likely become our new normal. “Especially where we might only have gotten one of these events every five or 10 years in the past, we’ll get two or three of these a year,” Robeson says. “That’s consistent with what we would expect, because, as it gets warmer, the atmosphere can hold more water vapor.” Put another way, imagine the atmosphere is a giant sponge. When temperatures are high, the sponge can hold a lot more water than it can when temperatures are low.

Like Robeson, Phillips also has worked with the Purdue Climate Change Research Center (PCCCR). He was lead author for the group’s report Indiana’s Future Forests. Regarding the amounts and timing of precipitation we can expect in the coming years, Phillips explains, “A lot of that rain is going to come in the winter and a lot of it’s going to come in the early spring. That has consequences—one of the most important being that it’s not going to come at a time when plants can use that water.”

Further, waterlogged soils and some significant flooding early each year, coupled with warmer temperatures, can make conditions just right for mosquitoes that carry tropical diseases including malaria, dengue fever, and Zika. According to another PCCCR report, Hoosiers’ Health in a Changing Climate, molds and fungi, which can develop after flooding events, also can threaten human health. “We can dangerous algal blooms, which blanket the surface of bodies of water during very hot weather. The algae creates toxins which can sicken humans. ‘These can be ingested through fish caught in the water, by drinking or touching infected water, and even breathing air near the water,’ the researchers explain. ‘Depending on the type of algae, the toxins can cause vomiting, diarrhea, confusion, seizures, liver damage, or even paralysis and death.’

The extra pollen hanging in the air over a longer period of time is expected to aggravate asthma and other lung ailments in children, the elderly, and people with compromised immune systems.

Hardships for farmers

The growing season, too, can be affected. Despite fewer days of frost, gardeners and farmers likely won’t be able to get their crops in the ground any sooner than usual due to heavy spring rains. And once crops are planted, they’ll have to struggle through hotter temperatures and drought conditions. Even warmer nighttime temperatures can affect a farmer’s bottom line. According to PCCCR’s agriculture research, “Observations show that Indiana corn yields are reduced by about 2 percent for every 1°F increase in overnight temperatures during July.”

To try better contend with longer, drier summers, some farmers could choose to install large (and expensive) irrigation systems. Naturally, all or part of that cost will be passed along to consumers. With fewer dry days, they may also have to face heavier insect pest loads and more weeds. Nuisance plants like poison ivy and ragweed could thrive particularly well within this new climate paradigm.

And, because ragweed and other allergen producers will enjoy longer growing seasons in the coming years, allergy season will be significantly longer and more dangerous for those with compromised immune systems.

In children, the elderly, and people with compromised immune systems.

If the trajectory of our greenhouse gas emissions continues to increase, urban centers throughout Indiana will be hit especially hard. This chart shows the historical average number of extreme heat days above 90ºF and the projected average number per year in the 2020s, 2030s, and 2040s. Data courtesy of Purdue Climate Change Research Center.
expected to increase, and potentially even double, by mid-century. To deal with more extreme heat days, some Indiana residents increasingly will remain indoors and crank up the air conditioning—a move which, although understandable, further exacerbates our emissions problem. “In terms of increased energy consumption, at least in the summertime, that’s a local problem,” Robeson says. “But atmospheric CO2 gets around pretty well, and emissions that we make in Indiana also contribute to global averages.” If we fail to modify our current emissions path by 2050, the PCCRC researchers maintain, extreme heat will cost the U.S. about $40 billion in lost wages. They add “In Indiana, most locations are projected to see about a 1.4 percent to 1.8 percent decline in available outdoor labor hours by 2050.”

Marcia Veldman, program/facility coordinator for the City of Bloomington Parks and Recreation Department, has seen first-hand how extreme heat affects the Bloomington Community Farmers’ Market. “In 2012, we had a really hot summer,” she recalls. “There were days when customer attendance plummeted because it was over 100 degrees, and it was really kind of hard to witness, because you know under what diffi- cult circumstances the farmers had worked to bring that product to market.”

Adding insult to injury? “One of the impacts of this is increase in pests, weeds, and also in disease vectors,” Veldman says. “We have had, I’m thinking, like six farmers who in recent years have contracted Lyme disease. That previously was just not heard of or was just very, very rare.”

When left untreated, Lyme disease can cause severe headaches, joint pain and swelling, and even short-term memory loss. According to the Centers for Disease Control and Prevention, an estimated 300,000 people may contract Lyme disease annually in the U.S. The Indiana State Department of Health reports the state’s Lyme disease incidence rate was 2.14 cases per 100,000 people in 2017. “The scary thing about global cli- mate change is that what we call natu- ral enemies—those could be pathogens or those could be, for instance, predato- tors—might allow the vectors of disease to move more quickly than normal into areas where they don’t have natural enemies,” says Marc Lame, clinical associate professor at the IU Paul H. O’Neill School of Public and Environmental Affairs. “Any slight change to the food chain or to the ecosystem is going to cause some havoc.”

Lame thinks global climate change already has affected the range of certain tick species. “The Lone Star tick, for instance, was not prevalent in Indiana 20 years ago, but it is now,” he says. “And, of course the diseases that go along with the Lone Star are there as well. Ehrlichiosis would be one that we’re seeing more of.” Some symptoms of the bacterial disease include fever, fa-

Water-logged soils and some signifi- cant flooding early each year, coupled with warmer temperatures, can make conditions just right for mosquitoes that carry tropical diseases including malaria, dengue fever, and Zika. Winners and losers As our climate shifts, so will some of the plant and animal species that call Indiana home. About four years ago, for example, Lame confirmed a Shelbyville resident’s sighting of a southern bark scorpion in the wild. “I found it in their backyard,” he says. “They’re coming from down south in Alabama and Georgia, but I was surprised to see them up here. Although the creatures are small, their stings are mighty, producing pain that can last for several hours to a day or more. “Now, there are reports of them being in Kentucky and southern Indiana more.” Lame continues. “We are going to see animals and diseases that were typically confined to the tropics and the subtropics moving up into areas that we haven’t seen them in before.”

Lame suspects Indiana will also host fire ants within a decade or so. “They’re con- sidered medically important, because they sting and their sting can send people into shock;” he says. “And they can cause second- ary infections. They definitely are a nuis- ance both to agriculture and to humans.”

IU Department of Biology associate professor Phillips says, “Who will be the winners and losers of climate change is al- ways really a challenging question, and that’s the important, take-home message of all of this. Not every species will be negatively affected. “To come up with an educated guess about the habitat changes for different spec- ies, researchers map species’ preferences along with predictive climate models. “Then, we sort of map those two things onto one an- other, and we can see where everything could move,” Phillips says. “If the climate goes this direction, it gets hotter and there’s less rain and there’s this temperature increase. How will that affect distribution of species just within their preferences?”

That doesn’t necessarily mean research- ers have a definitive picture for our future ecosystem. “You can’t point to a place in the southeastern United States and say, ‘That’s what the ecosystems of Indiana will look like,’” Phillips says. “It’s complicated, and
pollination services may see fewer—and weaker—bees in the coming, climate-challenged years.

**Economic impacts**

Climate change is bad for business in plenty of other ways. Retailers like J.L. Waters Adventure Outfitters, located on Bloomington’s downtown Square, long ago had to adapt to southern Indiana’s vanishing ski season and the closure of Ski Bloomington’s nearest ski resort. “We used to have a fully operative ski shop,” says Tyres Shelton, the store’s hard goods equipment buyer. “Once Ski World closed, we kind of moved out of that.”

A perfect storm of unreliable snowfalls, warmer weather, and astronomical insurance costs forced Ski World’s owners to replace downhill skiing with snow tubing in 2002. Established in 1979, Ski World had a long run, but ultimately couldn’t recover. A 2001 article in The Herald-Times says the business shut down permanently in November of that year. “As far as the change in the weather, we’ve definitely seen a pattern,” Shelton adds. “We have less warm clothing being sold in the winter. Like this year and last year, there are days when it’s 50 degrees in December or January.”

That doesn’t mean the store can do without parkas and pullovers completely. “The very random, sporadic weather we have has affected what we’ve sold and how it has sold.” Shelton says. “Like when the polar vortex came through, we wore up for that with heavier clothing.”

As if cued up solely to confuse the issue of climate change, the January polar vortex whipped Bloomington with a wind chill below minus 30°F that ultimately closed the IU campus and countless other institutions across the state. Meanwhile, President Donald Trump whipped up climate change deniers with this corresponding Tweet: “In the East, it could be the COLDEST New Year’s Eve on record. Perhaps we can use a little bit of that good old Global Warming that our Country, but not other countries, was going to pay TRILLIONS OF DOLLARS to protect against. Bundle up!”

Although such extreme weather may seem unfathomable, they are themselves thought to be triggered by the planet’s increasing temperatures. For instance, as warmer Arctic temperatures cause sea ice to melt, jet stream patterns can shift. Rather than remaining mostly contained along the Arctic Circle, the jet stream strays, bringing cold air along with it.

Jane Ellis, Brown County Convention and Visitors Bureau executive director, has noticed the effects of an altered pattern of extremes. Over the last few years, heavy rains have interfered with the VBC’s annual Winter in the Woods event. “The whole point is to come out and enjoy the winter, but the weather has been terrible to the point that it makes us kind of want to rethink it,” Ellis says. “The rain makes it kind of hard to hike in, and there’s also a run that weekend. It’s hard to run on the trails when they’re all sopping with mud.”

Historically, leaf peepers also flock to Brown County to eat, shop, and admire the area’s fall foliage, but that’s also changing. As far as fall leaves ‘brilliant reds, golds, and oranges, their color comes out with the right combination of cool evening temperatures, shorter day lengths, and a drop in available moisture. As these conditions become rarer, so, too, will the prolonged shows of fall color we’ve gotten used to.

As it happens, the live, streaming footage available via Ellis’ “leaf cam” has already demonstrated this. “The leaves do start changing earlier,” she says. “A lot of the yellow starts showing, but those leaves are kind of underneath a canopy of green. And when the leaves change, it seems like it’s almost overnight, Almost in a weekend.”

Gone, too, are the days of highly concentrated groups of visitors. “Years ago, Brown County, from October 1 to 31, was like a light switch—you could turn it on and turn it off,” Ellis says. “Over the years, we’ve seen that traffic spread out throughout the year. And, this past year, it seems as if it raised every weekend in October, so, that certainly put a damper on our weekend traffic.”

“Was measure things like the innskeepers’ tax collection, the state park’s gate fees, our web traffic, and walk-ins at the Visitors Center,” she concludes. “When you put it together, it seems to even out, but we are seeing the shifting seasons.”

**The challenge for gardeners**

If they haven’t already, avid gardeners soon will notice seasonal shifts of another sort, and, when climate change really hits us, succeeding with a simple vegetable garden or bed of ornamentals will require more thought and planning than ever. Amy Thompson has long coordinated the Monroe County Master Gardener Association and works as extension educator for Agriculturals and Natural Resources with Purdue Extension–Monroe County. “It’s not necessarily going to be, I’m going to stick this in the ground, and it’s going to grow.”

Thompson says. “The predictability has sort of gone out of things.”

Moya Andrews sounds downright wistful as she describes the way sprite sprung used to unfold. “You once knew that by March you would have your daffodils and your Forsythia,” says Bloom’s garden columnist. “And prob-
ably by late October, you’ll get your first killing frost. But now you won’t really be sure.”

Also the host of WFRV’s “Focus on Flowers” program, Andrews suggests gardeners try to be more exacting when choosing plants and planting sites. “Our plants have to be able to thrive in a huge number of diverse conditions,” she says. They also need to be able to survive increasing amounts of change over the long haul. “If we plant a tree now in our Indiana garden, in 25 years it probably won’t be able to survive in this climate even if it’s a native,” Andrews says. What to do instead? It may be time to match a non-native tree to your particular microclimate.

In general, gardeners who’ve become attuned to particular plant varieties eventually may need to bid many of them adieu. “Things that might normally have grown well here may now grow in southern Michigan well in the future,” Thompson says. “Unseen there are big changes, things will shift to where their optimal growing conditions are found.”

For example, Thompson says, “Maybe even in my lifetime, some apple varieties that we grow here aren’t going to be viable in southern Indiana, because they won’t have the length of chilling hours they need in order to set fruitlets.” In their place, some new-to-us plants might move in from the south. Horticulturists are also working to develop varieties which can better tolerate extremes, and it is a dim view. But now you can’t really be sure.”

The long view

“I feel like what we’re doing is selfish,” IU’s Department of Geography professor Robeson admits. “People are just really focused—understandably in some cases—on the short-term. They’re focused on their next paycheck or getting through this year. But, if we start to look at the longer-term picture, this is going to affect our children and our grandchildren, and it’s not fair. It’s just flat-out not fair.”

Considering the very real hardships we—and future generations—now face, it may be tempting to give up hope. And, while the volatility of climate change may feel like the only constant we all share, it doesn’t have to be. Turn out we also happen to have a healthy contingent of climate change activists quietly working behind-the-scenes to make a real difference. “It includes one Republican and multiple Democratic supporters,” she says. “It’s our hope that by June we’ll have bipartisan legislation introduced in the Senate, as well, that closely mirrors what is currently in the House.”

“Short-term action also helps other carbon-taxed industries,” Thompson says. “It’s a big job,” he says. “But you don’t have to do it all by yourself.”

Get Involved

Citizens’ Climate Lobby

The Citizens’ Climate Lobby South Central Indiana Chapter meets monthly. Visit https://citizensclimatelobby.org/chapters/IN_South_Central_Indiana for details.

Hoosier Environmental Council

The Hoosier Environmental Council continually seeks Environmental Advocates to help educate the public about environmental legislation currently in the Statehouse. Training sessions for new Environmental Advocates are held monthly. Visit www.hoosierlobby.org for details.

Earth Care

A network of faith communities concerned with climate change. Earth Care helps congregations and individuals working to shift to renewable energy. Earth Care meets monthly, and new members are welcome. To learn more visit www.earthcareindiana.org.