How Do Rural Hoosiers View Climate Change? Insights Toward Engagement and Policy Design

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Climate change and rural Hoosiers

Climate change is one of the most serious problems of our time (IPCC 2022). Vulnerable human communities across the United States are already experiencing risks associated with water availability, food production, extreme weather, and economic stability (USGCRP 2018). Many of these impacts will be felt across our state of Indiana. Extreme rain events, heat waves, and disease-spreading insect populations, such as mosquitos, are already on the rise and expected to continue to increase into the future given rising emissions (Wildham et al. 2018).

Rural Americans, including those in Indiana, often face acute risks from climate change. Flooding, heatwaves, and vector-borne disease present serious threats to rural Hoosiers' personal health. This is particularly concerning for rural areas given that rural populations are generally older on average (Smith and Trevelyan 2019). Beyond rural health, climate change is threatening and will continue to threaten the heavily agriculture-based economy of our state's rural counties (Wildham et al. 2018; Gowda et al. 2018). At the same time, rural communities are often less able to

adapt or prepare for these threats, as rural areas generally have higher levels of unemployment, less diversified economies, and limited social and economic resources to support adaptive management policies (Lal et al. 2011).

This Report—Goals and Methods:

This report aims to offer key introductory insight into how rural Hoosiers perceive climate change—their beliefs about the phenomenon and their concern about its' impact on their lives and community. Through outlining rural Hoosiers' perceptions of this critical topic, our aim is to provide critical fodder for the design of future engagement efforts and ultimately toward crafting more effective policy. Specifically, we feel our results speak toward the design of more effective communication around this to-date controversial topic. Indeed, one of our key findings is that rural Hoosiers may be more open to climate change discourse than earlier research and existing understanding of climate skepticism suggest.

To gather the data that provided this insight, we used two related approaches. First, to provide a population-level understanding about where rural Hoosiers stand regrading climate change, we drew on data from the Hoosier Life Survey 2.0 (HLS 2.0). The HLS 2.0 survey contained responses from approximately 1,200 Hoosiers from across the state. Respondents were asked to report their community type— rural, small town, suburban or urban. This was used for our comparative analysis and for later interview-targeting (see Appendix below for more details). To learn more about how rural Hoosiers view climate change, we followed up the survey by interviewing survey respondents in the Fall and Spring of 2021 and 2022, respectively. Using their survey responses, we selected potential respondents who self-identified as either "rural" or "small town" residents living in Monroe, Lawrence, and Greene counties of Indiana. These counties represent key focal points for existing rural-centric outreach in the state. Among this respondent pool, we focused on interviewing respondents who identified as highly skeptical of climate change and those who identified as highly concerned (see more details in Appendix).
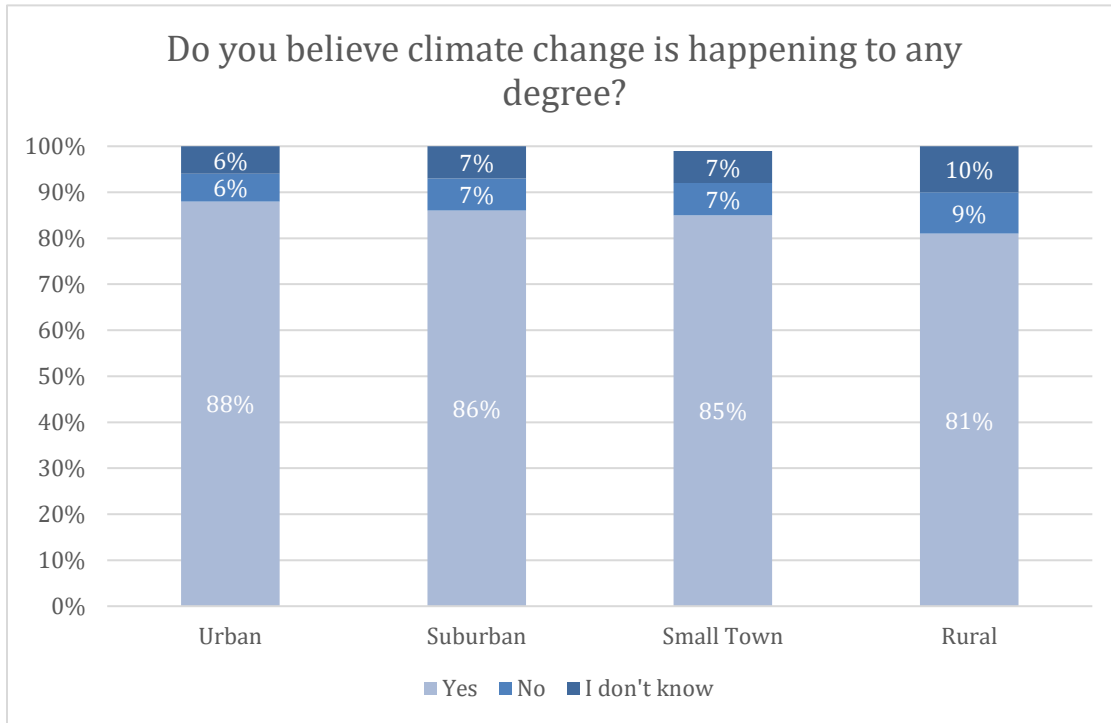
1. Survey Results

1.1 Survey data suggests rural Hoosiers are more skeptical, but often only marginally so.

When asked about their beliefs regarding the occurrence of climate change and the causes of climate change, rural and small-town Hoosiers generally expressed more skepticism that climate change was occurring (Figure 1) and were much more skeptical of humans' causal role in climate change than were their urban counterparts, respectively (Figure 2).
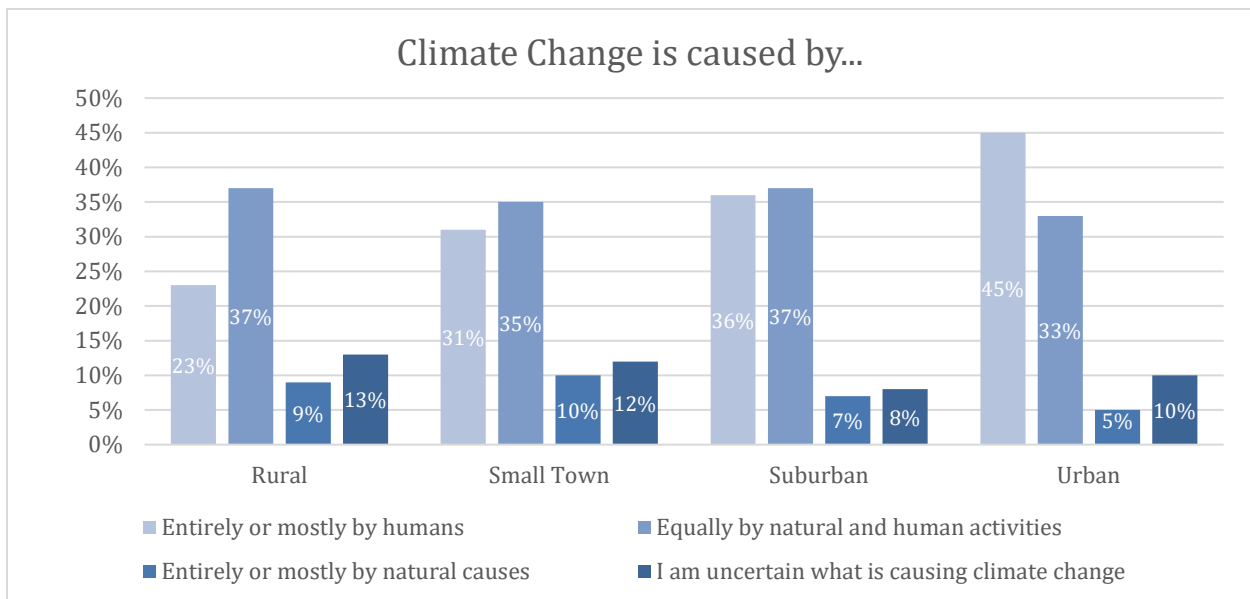
Figure 1: Skepticism among the rural public in Indiana

Rural respondents are less likely to believe that climate change is occurring

Do you believe climate change is happening to any degree?

	Urban	Suburban	Small Town	Rural
I don't know	6%	7%	7%	10%
No	6%	7%	7%	9%
Yes	88%	86%	85%	81%

■ Yes ■ No ■ I don't know

Our survey results reveal skepticism among the rural public in Indiana. While a majority of respondents from all areas agree that climate change is happening to some degree, rural respondents are both more likely to deny its existence and more likely to be unsure.

Figure 2: Rural/small town skepticism of anthropogenic climate change

Climate Change is caused by...

	Rural	Small Town	Suburban	Urban
Entirely or mostly by humans	23%	31%	36%	45%
Equally by natural and human activities	37%	35%	37%	33%
Entirely or mostly by natural causes	9%	10%	7%	5%
I am uncertain what is causing climate change	13%	12%	8%	10%

■ Entirely or mostly by humans   ■ Equally by natural and human activities
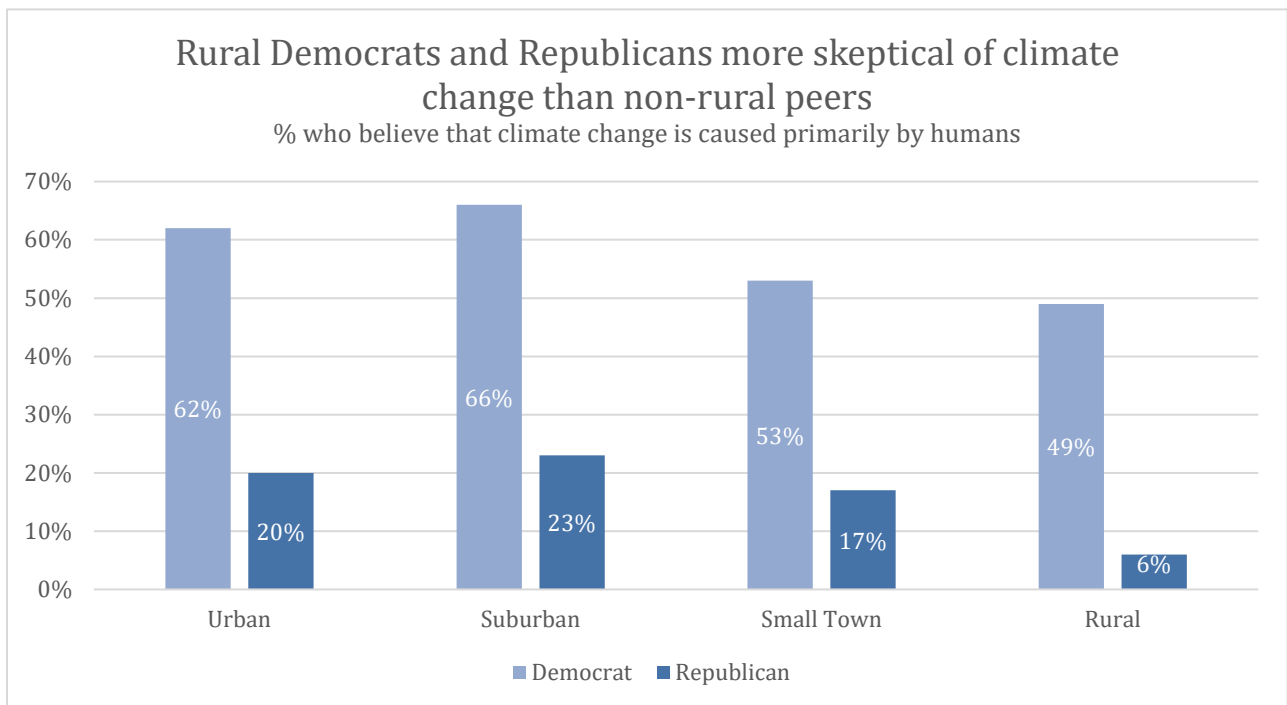■ Entirely or mostly by natural causes   ■ I am uncertain what is causing climate change

Beyond skepticism of the existence of climate change, there is skepticism about its causes among Indiana respondents. This skepticism is further exacerbated by place. As seen in Figure 2 above, rural respondents are less likely to believe that climate change is anthropogenic.

1.2 Political affiliation and rural communities have complex relationships when it comes to climate change attitudes:

Conservatives are generally much more skeptical of climate change than liberals in the United States (McCright et al. 2016) and this certainly holds true across community types in Indiana. Specifically, rural, Hoosiers who identify as Republicans (6%) are much less likely to believe humans cause climate change than are rural Hoosiers who identify as Democrats (49%). Notably, though, politics is not the only factor here. Even among Republicans and Democrats in the state, across both groups those living in rural communities are generally more skeptical than those living in urban areas (Figure 3). This also holds true for those who identify as living in "small towns."

Figure 3: Strong levels of skepticism among rural residents despite political affiliation

Even when accounting for political affiliation, rural respondents generally presented higher levels of skepticism

Rural Democrats and Republicans more skeptical of climate change than non-rural peers
% who believe that climate change is caused primarily by humans

2. Interview Results

2.1 Ambivalence in climate change views

Despite the leanings suggested by our survey data, interviews with 10 survey respondents pointed to more complex climate change attitudes that are not able to be captured by survey data alone. We intentionally selected respondents who either reported strong levels of skepticism (low belief and limited concern) or strong levels of acceptance (high belief and concerns). We generally anticipated that individuals from each group would reveal why they were entrenched in skepticism or how they came to view climate change through a scientific perspective despite the rural community leanings around them.

To our surprise, what most clearly stood out was the complexity of these rural residents' understandings and views of climate change. Many respondents expressed contradictory thoughts at different points in their interviews, often including strong skepticism on some points, and notable concerns on others, for instance. What our interviews suggest is that many rural Hoosiers are likely less strongly entrenched in climate change skepticism then statistical results alone would indicate, and similarly, many who do express belief or concern also have some doubts about some aspects of climate change (see Table 1).

Table 1: Clear ambivalence among respondents

Instead of a dichotomy of concerned v. unconcerned, this table expresses the nuances of rural climate change attitudes

	Skepticism/ lack of concern/ contradiction to concern/ belief	"Pushes" toward Concern/ belief	"Pulls" from Concern/ belief
Respondent #8			Discussing adaptation measures and lack of adaptation, "I think it's mainly just a lack of money, like a lot of people in Lawrence County work pretty.. Barely minimum wage jobs, like I'm talking like probably $10-15 an hour jobs."
Respondent #10		"I believe it's true… I do think the climate is heating up. So that is scary when you think about it." "Humans for sure… and	"There are conspiracy theorists for every little thing, and I do not claim to know anything about anything"

		things like gas and chemicals that we use [are causing climate change]." "I grew up camping, so nature, being outside grounds me" "I'm an animal lover, so with climate change the first thing that ever clicked for me was with the polar bears and animals in the colder regions having less area." "[I'm concerned for] like my grandkids and future generations"	
Respondent #3	"I think what we're doing is changing our environment, sometimes I don't even think it's climate change. It's people not feeling like they need to use what they have anymore. You know like you don't even have to clean your plate. We have so much that we are being really wasteful." "I honestly feel like there are steps being taken to try to help but I question if it's too late to do something now."	"I think it's real. I think every winter we see the effects of it." "That and when you look at the bigger picture around the world, when you start to pay attention, they tell you that you need to visit glacier national park now because it's melting." "Our actions as humans most definitely." "More weather that is going to impact our lives. That's probably my main concern, especially as a farming family."	"The one thing that's not fair is all the talk about the cattle waste, causing climate change. Have you heard all about that? I honestly do not believe the amount of waste from the cows in the United States are causing near the issue that our man-made things are because the cows have been here forever. So that's the one thing I think that the cattle are getting an unfair hit on this maybe."
Respondent #5	"I do believe that the problem is real. However, I just don't believe that the policies and the planning have aligned with the problem, I guess. I don't believe that, you know, that they are necessarily thinking about the people that might be misplaced because of it."	"I believe it's very real."	"I believe that I don't know the current policies are probably kind of hurting us. As a community here, a lot of people in Linton rely on coal mining opportunities. Everyone's shifting away from fossil fuels or trying to. So a lot of the mines are downsizing or closing altogether. Yeah, and Linton, Indiana was built

			on the mining industry. Without a lot of renewable energy to make up for it. A lot of them were trying to, you know, some of them spent their whole lives with no training to do something else."
Respondent #9	"If you could reuse and recycle and cut down the number of things you needed to create, you would create less heat in your manufacturing process"	"Well, I think that it is gonna get far worse, far faster than people think... Climate change is real." "It's very blatantly obvious that climate change is here, it's real, it's exacerbated, and I think it has to be part of the cycle or the cause of the cycle of the weird out of season storms... It's affecting how the winds blow."	"My family in Lawrence county, my farm family, think that me and my brother... Are a bunch of communist democrats, hippie do-gooders, and we're tolerated, but not necessarily believed or followed."
Respondent #1	"It's really hard because I feel like you get a lot of mixed messaging on the news... there's things that seem very remote to me, like okay it looks like that's an issue, but that's not really an issue for me" "I just feel like it almost is starting to be this overwhelming phrase for like everything that is going wrong, and it's hard for me sitting here to know... I just don't know what I think about it, sorry."	"Of course we all care about climate change because it affects the crops, gosh it affects so many things. So I do think that they do care." "I mean obviously there's things that are worrisome"	"I was watching something the other day on TV where they were talking about cows contributing to the methane gas, I mean are we really not going to have cows? Just to decrease the level of methane gas in the atmosphere. Those are the kinds of things that I don't know, I'm not smart enough to know."
Respondent #6	"I have mixed feelings about what the causes are and what to believe, I don't know. I mean, it's not like I can go research." "I don't like listening to politicians drone on about, well, this, because I have a distrust for politicians right now."	"I feel like I know for a fact that the climate is changing, because whenever I was growing up here, I mean, I have a perfect timeline or not timeline but whatever, like I can see visually pictures in my mind of whenever I had snow on the ground every year, you know, lots	"I've heard that the cows produce too much methane and cause our ozone layer to be depleted faster than just us." "I mean, it could really be a difference on whether or not they could feed their family. I mean, because maybe they couldn't drive

	"No, I think science depends. I mean, if they're being paid for by big pharma, or something, no, or be paid for by a big, like, oil industry."	of snow like I was here in the blizzard of '78." "I think it's just on the daily concern."	their car to work anymore or something, you know, or driving illegally, and they get a ticket or whatever they do. And so stuff like that bugs me when policies are made when they don't have any exceptions or have a fund to help people when it's not their fault."
Respondent #2	"I am not 100 percent convinced that it is us causing it or that there is much we can do about it." " Unfortunately, due to Covid thing it caused me to be skeptical either way. I don't know. I am definitely a believer of science but I believe that science can be done in a way that leads to answers that they want type thing and they can't always know everything."	"I think it is happening somewhat." "Overall I guess I am concerned about it on the whole world basis. We can put up all the solar panels we want in Bloomington, but if the rest of the world doesn't do anything it isn't going to help any."	"Probably, and they would probably like for me to quit driving my truck and quit burning my wood stove." "They probably aren't worried about it. They are worried about getting off work and going to buy a beer. They just want to drive their camper down to a place to take it easy for the weekend."
Respondent #7	"I just can't go along with all this going on. Because I see how over the Millennium or whatever, you know, the climate has changed from the Arctic, I think they were finding, you know, things that were deposited there when it was like, you know, green and whatever. It's just, I feel like we're in a cycle that the world has and there are some things that are pollution... I just feel like it's, it's just really occurring, because it's a natural process."	"And so I think just health wise and that, you know, I, I have concern about pollution that we have in the rivers and whatever." "Now, I think sometimes with, with the trees and some of the green, you know, environment, I get concerned, you know, I, I know that that can be affected. And then I get concerned for people, like they have asthma or have respiratory things that are really are affected by the pollution, and, you know, what's in the air."	"My thought is that this push of the green New Deal, and the political aspect of it has just turned off people and they just ignore it, or they don't pay any attention to it. They just see it as a political thing." "That's the biggest thing is, I just, the people that are pushing it are changing everything, that kind of how, you know, how the world is running wants to change everything. I just, I have a real problem. And that's what turns me off when you talk about climate change. Plus, I just think it's a normal thing that's also happening."

Respondent #4	"I think climate change is, if you go back and look at history, or the last million years, the earth's gone through many ice ages… So anyway, so if we look at history, of all the change the climate around the world, we're only seeing history from are we, you and I and the people around here. We're just a little snippet of history, last 100 or 200 years, about all we know about really. And I don't think humans are affecting the world that bad."	"I would like to, eventually I think we will be off fossil fuels. There's only so much fossil fuels left in the world. So within, let's say we didn't. And we just kept using fossil fuels. Eventually, maybe 100 years? I don't know. 200 years, we'd run out of fossil fuel. Yeah. So I think that so I do think getting off of fossil fuels is a good idea. You got to do it smart and you got to do it over a long period of time." " And I think the more and more we get solar, the more I think it would help everybody." "I think the number one way that would help climate change, and help society in general, is to have term limits on Congress."	"Climate change seems to be a liberal thinking mindset to me. Most Republicans, I think they are particularly lately debunking it. We don't have climate change." "I don't like to see pollution and I don't like to see pollution in the ocean. I don't like to see black smoke coming up out of smokestacks. I would love to see cleaner air and all that. But if you're going to do it, and the person can't feed your family then, because gasoline is $8 a gallon?"

2.2 What factors shaped respondent's views on climate change?

Respondents expressed various points of concern and skepticism, and we found that there are specific factors that consistently motivated respondents to be concerned or believe in climate science, while other factors motivated skepticism (below). What is important to note is that these "push" and "pull" factors occurred across each interview. In response to one question respondents would justify concern, and in another they would reference a reason why they weren't sure or as concerned (see Table 1). Often, respondents' comments suggest that they perceive the current climate change discourse as largely tailored to more urban value systems and lifestyles. This means that while proposed climate action like driving electric cars is appealing to some, it ignores the income restrictions of many rural residents, as well as culturally significant aspects of rural life, such as driving trucks; making climate action seem threatening or abstract. At the same time, family values of rural populations tend to push them towards concern for children or grandchildren. Throughout these interviews the tension or oscillation between these push-and-pull factors were almost constant as each respondent spoke and characterized their climate change attitudes, which were ultimately often

ambivalent, rather than firmly entrenched. Below we discuss these factors in more detail, followed by a discussion of the "pull" factors.

2.3 Factors pushing respondents towards acceptance

2.3.1 Human health

Across the range of belief in the sample, concerns for human health were prevalent. Whether discussing potential extreme weather or air and water quality, multiple respondents reported concern for human health in the face of climate change. One respondent who works in local public healthcare noted increased heat waves and severe heat as a major threat to health that has already proven challenging in her rural county:

> "... you've got people who aren't in good energy-efficient houses with air conditioning... it just does seem like there's more heat-stroke and heat-related deaths than we remember." (#1)

> "...yeah, it's already impacting us, something has caused our drinking water in the lake right down here a while back, it had some kind of, like bad algae in it." (#6)

Concern for health when considering climate change also pointed to possible misunderstandings of climate change itself; with some respondents equating pollution in general to carbon pollution resulting in climate effects:

> "And so I think just health wise and that, you know, I, I have concern about pollution that we have in the rivers and whatever... And then I get concerned for people, like they have asthma or have respiratory things that are really are affected by the pollution, and, you know, what's in the air." (#7)

Despite occasional conflation of climate change with pollution generally, there is a clear concern for human health among rural communities, which pushes respondents towards acceptance of climate change.

2.3.2 Preservation

Additionally, concern for the preservation of natural spaces was a common thread, with a focus on national parks and designated outdoor spaces. Multiple respondents noted spending a lot of time enjoying natural spaces and had concerns about the future of those spaces. Whether it be hiking at different parks across the state or taking family vacations to national parks across the country, multiple respondents showed concern for their preservation. There is a pristine image of these designated natural spaces and respondents seem to value them as places of relaxation,

restoration, and connection. There were multiple respondents who expressed concern for pristine natural spaces in the face of climate change:

> *"That and when you look at the bigger picture around the world, when you start to pay attention, they tell you that you need to visit Glacier National Park now because it's melting." (#3)*

Many respondents were also concerned for the preservation of the natural environment of rural life, including farmland. This is not surprising considering the literature on place attachment and climate change, which finds that personal attachment to a given place play a role in climate concern and action (Devine-Wright 2013). Furthermore, as many respondents were at least tangentially connected to agriculture, they expressed concerns for its future in the face of climate change effects such as extreme weather. Thus, respondents showed concern for the preservation of natural spaces both in the sense of appreciation of natural beauty and for more practical productivity/economic reasons:

> *"More weather that is going to impact our lives. That's probably my main concern, especially as a farming family." (#3).*

> *"Of course, we all care about climate change because it affects the crops, gosh it affects so many things. So I do think that they do care." (#1).*

> *"I am worried because I love living in a rural area and I would love things to stay the same for me and I'm sure people who live all over the world who are there because they love the environment they are in, want it to stay that way" (#1).*

2.3.3 Family

Family was also a major factor in drawing respondents towards belief and concern. Respondents often referenced their families, children, grandchildren, and spouses throughout the interviews. Rural people and small towns are generally seen to value family ties more so than their urban counterparts (Mair and Thivierge-Rikard 2010). Reflecting this place-specific value, many respondents, especially women, referenced their children or grandchildren. Some were influenced by their older children to be more concerned, while others were inspired by their young grandchildren to more thoughtfully consider the future of their planet. It is important to note that this finding was especially prevalent among female respondents. This is consistent with the literature establishing women's greater concern about climate change (Price & Bohon 2019). As one female respondent illustratively expressed:

> *"It's hard for me because I just feel like, I've got kids who I feel like are probably smarter than I am and they're concerned about it so I feel like if they're concerned about it, I need to be concerned about it." (#1).*

"So, you know, if I just had myself to worry about, I know, things are probably still going to be okay in my lifespan. But when you think about a new granddaughter that could possibly live 100 years because of our life expectancy keeps going up. You know, what's, what's it gonna look like here in 100 years? You start to just think a lot more about it." (#3)

Family plays a major role in rural life, and it has the potential to heavily influence climate change attitudes and concern. When considering this factor pushing respondents towards acceptance, it is clear that demographic factors, especially gender, are important.

2.4 Factors Pulling Respondents Away from Acceptance

While the above push factors drew respondents towards belief or concern, there were contrasting pull factors inciting skepticism. The most prevalent factors pulling respondents away from acceptance are potential threats to the rural way of life, economics, and politics.

2.4.1 Rural cultural norms

Cultural norms (sometimes "social norms") are the social activities that surround us or that we practice that provide a sense of self and place that ultimately enable individuals to feel connected to one another and their community. Interviewees commonly noted how they lacked belief in or willingness to respond to climate change given how mitigation efforts would necessarily limit their capacity to live out rural ways of life or fulfill rural cultural norms. Rural America contains its own unique cultures, many of them related to agriculture, an industry that is currently intertwined with the fossil fuel industry (Winebarger 2011). Key aspects of rural life come in direct contention with current narratives of climate change action. For instance, some respondents expressed how behavioral changes required to mitigate emissions would directly threaten key aspects of their rural experience, namely the agrarian sectors' cattle production. While climate mitigation related to cattle could be seen to offer a material (rather than cultural) economic threat to cattle producers, none of our respondents were directly involved in the farming industry. Instead, we see their comments to reflect a large effort to maintain traditional rural livelihoods, and therefore cultural norms:

"The one thing that's not fair is all the talk about the cattle waste, causing climate change. Have you heard all about that? I honestly do not believe the amount of waste from the cows in the United States are causing near the issue that our man-made things are because the cows have been here forever. So that's the one thing I think that the cattle are getting an unfair hit on this maybe." (#3).

"I was watching something the other day on TV where they were talking about cows contributing to the methane gas, I mean are we really not going to have

cows? Just to decrease the level of methane gas in the atmosphere. Those are the kinds of things that I don't know, I'm not smart enough to know." (#1).

"I've heard that the cows produce too much methane and cause our ozone layer to be depleted faster than just us." (#6).

Relatedly, one respondent directly noted how addressing climate change is at odds with his preference for driving a large, pickup-truck:

"They would probably like for me to quit driving my truck." (#2).

Truck ownership is a well-known cultural express of rural notions of traditional masculinity, often tied to work in a natural resource-dependent economy, such as agriculture or mining, or even blue-collar work and ethics generally. This respondent express skepticism about the need to address climate change given that action might require him to give up this cultural practice for a more fuel-efficient vehicle—a norm he implied he was not willing to counter.

Surely, these fears or even an unwillingness to sacrifice one's capacity to live out contemporary cultural norms for the sake of future generations' capacity to operate within a stable climate is not simply a rural problem. The pressure to sustain cultural notions of "normal" have long been seen to dissuade acceptance of climate change (Norgaard 2011). As one of our respondents put it, the need for rapid, widespread change is a problem in itself given this drive for normalcy:

"That's the biggest thing is, I just, the people that are pushing it are changing everything, that kind of how, you know, how the world is running wants to change everything. I just, I have a real problem. And that's what turns me off when you talk about climate change." (#7).

While certainly a general pressure exists, rural places face unique challenges when it comes to mitigating climate change. Given the importance of close ties and "fitting in" in rural areas (see above), making these changes may prove particularly challenging in these communities. In short, the personal and social implications of diverging from traditional rural practices and economies poses a significant barrier to behavior change, and appears to be leading respondents to be more skeptical of the reality of climate change, less concerned about its impacts, and overall less willing to consider climate actions. Immediate social life is more important than saving it from hard to grasp, distant, yet imminent threats, such as climate change.

2.4.2. Economic threats, resource dependent economies, and inequality

The potential economic impacts of climate change action also drew respondents away from acceptance. Regardless of whether or not they theoretically support certain policies to transition away from fossil fuels, many respondents are concerned that they simply will not be able to afford the newly mandated

alternatives. While related to some of the normative concerns above, this disconnect between necessary climate action and rural access is unique to the degree which it ties into respondents' perceptions of rural injustice. Multiple residents noted the potential benefits of climate action, but countered that with a clear understanding of the economic limitations among rural communities and livelihoods:

> *"I don't like to see pollution and I don't like to see pollution in the ocean. I don't like to see black smoke coming up out of smokestacks. I would love to see cleaner air and all that. But if you're going to do it, and the person can't feed your family then, because gasoline is $8 a gallon." (#4).*

> *"I mean, it could really be a difference on whether or not they could feed their family. I mean, because maybe they couldn't drive their car to work anymore or something, you know, or driving illegally, and they get a ticket or whatever they do. And so stuff like that bugs me when policies are made when they don't have any exceptions or have a fund to help people when it's not their fault." (#6).*

> *"You know these electric cars sound great, but I have no idea if we'll ever be able to afford one, my husband and I." (#1).*

While these economic limitations to participation in "green" transitions are apparent in multiple places, rural communities across the country and in Indiana have generally seen steady economic downturns in the post-industrial era, leading residents, and our respondents to be likely to face financial challenges and burdens when it comes to personally transitioning to a more sustainable societal model (Lal et al. 2011). One respondent's comments illustrate this well, noting limited interest in responding to climate change given, "[J]ust a lack of money, like a lot of people in Lawrence County work pretty.. Barely minimum wage jobs, like I'm talking like probably $10-15 an hour jobs."

Limited rural economies made climate action seem financially impossible to some, while others noted the threats to traditional fuel industries, such as coal production, which have the potential to put a whole community out of work and further exacerbate financial challenges:

> *"I believe that, I don't know, the current policies are probably kind of hurting us. As a community here, a lot of people in Linton rely on coal mining opportunities. Everyone's shifting away from fossil fuels or trying to. So a lot of the mines are downsizing or closing altogether." (#5).*

Despite recognizing the potential benefits of climate action and adaptation, rural residents are faced with the hard realities and limitations of their financial position. There is clearly concern that any new policies are, and will continue to, leave them behind in many ways.

2.4.3. Politics and political ideology

The impact of political affiliation on individuals' climate change views is well established in existing literature (McCright et al. 2016), and it certainly plays a part in rural climate change attitudes. Republicans are generally more skeptical of climate change than Democrats (Diamond 2020). Many respondents recognized the prevalent Republican presence in their communities and made the connection between that political stance and climate skepticism. There is a narrative of a "liberal agenda" among rural respondents that does not include or support rural communities and needs.

> *"My thought is that this push of the green New Deal, and the political aspect of it has just turned off people and they just ignore it, or they don't pay any attention to it. They just see it as a political thing." (#7)*

> *"Climate change seems to be a liberal-thinking mindset to me. Most Republicans, I think they are particularly lately debunking it. We don't have climate change." (#4).*

Rural Americans, on the whole, tend to lean conservative and this personal and community political stance represent a major factor pulling residents away from belief and concern. Accepting climate change could seem impossible to many who strongly identify with their political affiliation.

2.5 Younger rural residents generally more accepting, especially young women

Rural communities are not homogenous. While they may lack the diversity of many urban centers, there are key demographic variations across rural populations. Accounting for these factors may reveal key groups of rural people most (or least) likely to be accepting of climate change science and climate-related policy efforts. Specifically, in Indiana, younger people have generally been found to be less skeptical (Houser et al. 2020).

How age matters in rural places has not been widely researched, but our data suggests that it could play an important role in our interviewees' climate change views. Across our sample, younger respondents were generally more likely to believe in anthropogenic climate change and be concerned about its impacts, while the most skeptical and least concerned respondents were older (results not shown). Respondents tended to explicitly note their age as a deterrent, often implying that they were likely to pass away before significant climate risks emerged. In contrast, younger respondents' comments point to the importance of climate change curriculum in K-12 school and how this process helps to normalize the concept. For instance, one of our youngest participants (age bracket 18-25 years old), implicitly noted the importance of integrating climate change into the K-12 curriculum when saying, "I 100% believe [climate change is] happening. As for how it's happening, I took an Earth and Space class [in high school], so I understand the general

concept." The belief in anthropogenic climate change, and the confidence to express it were tied to this individuals' experiences in high school. While our sample is small, it begins to suggest the potential importance of this early exposure to climate science.

As this suggests, demographic factors like age interact with the push-and-pull factors noted above. Push-and-pull factors are culturally significant and widespread among the rural population, but it appears that individual-level demographics like age-cohort may shape the degree to which those factors resonate with and are influential on individuals' climate change views.

3. Key Implications of Research for Engagement and Policy

What do our findings mean for the practice of promoting and enabling climate resilience? Below we briefly articulate key takeaways from our research.

- Ultimately, accepting the reality of climate change hurts rural residents socially given cultural norms. However, denying its existence leads to material loss of many aspects of rural lifestyles. Thus, various push-and-pull factors contribute to complex climate change attitudes among rural populations. The first step to addressing these conflicting thoughts is offering win-win solutions; for example, affordable electric trucks. While these solutions may not be the transformative action some call for, they are constructive nonetheless and may help to precipitate larger change in the near term.

- Demographic factors, specifically age, may play a major role in climate change attitudes among rural residents. This may point to avenues for future engagement efforts. For example, our most concerned respondent consistently referenced her high school environmental science class as informing her views, which points to K-12 education as a way to engage young people, especially in rural areas. Programs, such as Indiana University's Educating for Environmental Change program, which focuses on empowering K-12 teachers to teach about climate change, are therefore critically important to informing the public. Specific effort should be made to ensure these initiatives reach rural school districts.

- Beyond educating the next generation, action needs to be taken now. While further research on rural climate change attitudes is necessary, these research findings indicate that some degree of concern is widely shared. Appealing to the issues that rural people care about, such as agriculture or community, while discussing climate change actions could be effective in increasing concern and willingness to support and pursue adaptation.

- Overall, this research identifies a unique ambivalence among rural respondents. While it has long been assumed that rural communities are either in denial or skeptical of climate change, we find that—while there is skepticism—climate change attitudes are much more complex in rural communities. Holding those conversations and listening to what rural people need and want in regard to climate mitigation and adaptation is a key early step in addressing the issue.

Appendix: Methods

This research relies on a mixed-methods approach that draws on both statistical data from the second Hoosier Life Survey (HLS2) and qualitative data collected through phone interviews with HLS2 respondents. The HLS2 is a longitudinal panel survey, following the first Hoosier Life Survey (HLS1) (see Houser et al. 2022 for more detail). To gather the initial sample and data via the HLS1, surveys were sent to 10,000 Indiana households across the state. Addresses were purchased from a private address-based sampling vendor. In mailing surveys to these households, we used a modified Dillman approach, with a total of five mailing waves. For the second wave of the HLS2 survey, we re-surveyed those respondents from our original sample who agreed to participate in future studies. Of our approximately 2,700 respondents to the 2019 survey, 2,021 (76 percent) agreed to receive requests to participate in future studies requests.

For the HLS2, we used a unique mixed-mode, adapted tailored design approach. This delivery approach capitalized on existing contact information. We split our sample into two categories: those who provided email addresses and those who did not. Of the more than 2,000 HLS1 respondents who agreed to participate in future studies, more than 1,200 provided their email addresses. To this group, we emailed an invitation, including a link to the survey. The online survey was designed and hosted on IU's Qualtrics account, a widely used online survey design software program. To the approximately 800 HLS1 respondents who agreed to participate but did not provide an email address, we mailed a survey packet and cover letter to their known home address. Non-respondents in both groups received follow- up notifications. Each respondent who completes the survey was entered to win a $50-dollar gift card (one of 20 available in total) as a post-incentive. Our survey ran between October 2020—March 2021

Of the 2,021 potential respondents, approximately 1,200 returned our survey for an unweighted response rate of approximately 59.4%. This data was analyzed using Stata statistical analysis software.

From this survey sample, we selected candidates for follow-up interviews. We intentionally selected respondents in order to create a sample that best represented both ends of the population. We narrowed potential respondents to those who self-

identified as either "rural" or "small town" residents living in Monroe, Lawrence, and Greene counties of Indiana. These counties represent key focal points for existing rural-centric outreach in the state. Among this respondent pool, we focused on interviewing respondents who identified as highly skeptical of climate change and those who identified as highly concerned, based on the creation of a concern variable which indexed three indicator variables (see table 1).

Table 1: Concern index questions

Question 1	How much do you think climate change will harm people in Indiana?	1=Not at all 2=Only a little 3=A moderate amount 4=A great deal 9998=Don't know
Question 2	How much do you think climate change will harm you personally?	1=Not at all 2=Only a little 3=A moderate amount 4=A great deal 9998=Don't know
Question 3	How much do you think climate change will harm plants and animal species in Indiana?	1=Not at all 2=Only a little 3=A moderate amount 4=A great deal 9998=Don't know

From October to January, 48 respondents were contacted via email, and we received 10 responses resulting in phone interviews, Interviews were conducted via telephone and lasted on average 51 minutes and 10 seconds. We used a semi-structured interview guide that included questions related to the respondents' views on climate change, its risks and impacts, and how they felt policy could better

enable rural residents in their area to be resilient to climate impacts. Each respondent received a $100 gift upon completion of the interview.

Interviews were transcribed and then analyzed using a thematic analysis of push-and-pull factors toward and away from acceptance/concern about climate change.

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