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U.S. Geography and Its Impact on Public Perception of Climate Change: An analysis of the role of geography, partisanship, and media on American public sentiment.

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Abstract

Perception of climate change is often considered an issue of partisanship in America despite the scientific literature stating its factual reality. While the public sentiment reflects both people in favor of climate change policies and others in climate change denial, the geographical landscape of America contributes to the public perception surrounding climate change. Within America's various regions, Southern and Midwestern areas face the greatest immediate climate-hardships while Northern and Western areas may begin to reap benefits initially. But regardless of region, vulnerable communities are the most at risk of climate-hardships. In order for America to approach climate change in a just way moving forward, it is significant to assess the role that partisanship, geography, media, and elitism play in forming the public sentiment surrounding climate change.

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The approval of the Inflation Reduction Act under the Biden administration drives America towards a clean and renewable energy focus, with the concentration on reducing carbon dioxide emissions. This reaches the American economy through both industries and everyday Americans, which suggests that America believes it is time to address the climate-hardships posed by climate change and global warming. Although some states have a wide range of legislation and policies governing environmental practices, the efficiency and consistency within national boundaries is reduced due to the miscellaneous practices of each state (Basseches et al., 2022, p. 1-2). However, climate change does not operate within the confines of an American state, but in totality of the global sphere. The National Climate Assessment Review adds, "Impacts due to climate change will cross community and regional lines, making solutions dependent upon meaningful participation of numerous stakeholders from federal, state, local, and tribal governments, science and academia, the private sector, non-profit organizations, and the general public" (2014). The Inflation Reduction Act is America's first national approach at legislation which solidifies the need for responsibility and action in both the industrial and public realms.

With this in mind, it leads to question how public sentiment surrounding climate is influenced and if there is a significant link to lived experience. Some national events are considered more detrimental to certain communities than others, which happens in America as some towns face the daunting implications of climate change while others see only a mere increase in temperature. Due to the United States' collage of various geographies and elevations, lifestyles and experiences can fluctuate greatly when comparing one state to another. For

example, public transportation via subways or carpooling is often a daily endeavor in major American cities, yet a very distant concept to those who reside in rural towns. This poses two overarching questions: Does geography impact one's perception of climate change in the United States? What role does public perception (i.e., media, politics, etc.) play in shaping views simultaneously with lived experience? I believe varying geography across the U.S. has brought issues of climate change more vividly and impactfully to some areas than others, creating a divide in the climate change movement and the sentiment surrounding it. However, many areas facing some of the most climate-hardships in the United States are acutely conservative, Republican voting states. Why is this? What is the sentiment in these states compared to others in terms of climate change? Does economy play a primary role in this view?

Importance and Disparities

Climate change is a transnational issue causing both ethical and political problems, such as migration, land destruction, and hunger. Impacts of climate change are not solely limited to the effects of global warming, but also include but are not limited to drought and flooding, rising sea levels, intense and frequent weather, and declining biodiversity. Ultimately, climate change has and will continue to render some areas inhabitable, resulting in emigration from those areas. With a dense population living within more confined bounds, rise and spread of disease, hunger, and limited resources are called into question. Despite the ambiguity often associated with climate change, its prevalence has grown and will continue to expand and intensify, which will cause more tension within and between nations (i.e., immigration, lack of water, etc.). Although climate change does not look the same to each individual, each nation, or each continent, its effects are ultimately inescapable.

Globally, America is the top nation emitting greenhouses gases per capita compared to any other nation (*Global Emissions*, n.d.). Despite this national contribution, the impacts of climate change are dispersed unevenly within the United States, specifically targeting vulnerable groups[1]. A report by the Environmental Protection Agency (EPA) analyzes the impact of six specific climate change hazards[2], noting the severe effects that will harm vulnerable communities more than their less-vulnerable counterparts. Poor air quality and pollution can often lead to the development of asthma, which will be most prevalent in minority groups. Extreme temperatures can result in health problems such as mortality, specifically impacting low-income families the greatest. These extreme temperatures can also affect the labor market, which will interfere with over a quarter of low-income communities, those of minority status, and those without a high school diploma. Minorities will also be most predisposed to heavy traffic from coastal flooding, while minorities and lower education individuals will face the most property damage from flooding (EPA, 2021, p. 8). Each dangerous effect of climate change listed in the EPA report will disproportionately harm vulnerable communities, but why is this happening?

When looking at individual statistics, the EPA's results are staggering: "Black and African American individuals are 40% more likely than non-Black and non-African American individuals to currently live in areas with the highest projected increases in mortality rates due to climate-driven changes in extreme temperatures" (2021, p. 6). In America's current state, areas of lower socioeconomic status are often ill-equipped for the hazardous results of climate change, especially as long-term resources and aid are often distributed according to the leisure of

[1] Low income, Minority, No High School Diploma, and 65 and Older
[2] Air Quality and Health, Extreme Temperature and Health, Extreme Temperature and Labor, Coastal Flooding and Traffic, Coastal Flooding and Property, and Inland Flooding and Property

Congress. The United States Department of Agriculture adds, “Social vulnerability and equity in the context of climate change are important because some populations may have less capacity to prepare for, respond to, and recover from climate-related hazards and effects” (Lynn et al., 2011, p. 1). Primary examples of this include the Flint and Jackson Water Crises. Rather than having preventive measures and resources in place, many of these lower socioeconomic communities only receive help once the situation has already had dire impacts on the population.

While specific communities are going to be explicitly more impacted by climate change than others, geography also plays an important and interconnected role. Rural areas are typically lower in economic status than their urban counterparts, which has been reflected in the economic development throughout the years. Lal et al. (2011) note, “The urban rural gap has been widening recently. For example, between 1993 and 2004, rural areas averaged 0.5% annual growth in real earnings compared to 1.2% per year in urban areas” (p. 823). Not only do rural areas have lower annual incomes, education, and access to highly skilled jobs than urban areas, but transportation and energy efficiency also become areas of contention when considering the impacts of climate change on these communities.

Despite less of the population living in rural America, natural resources and production from rural land is essential to the rest of the nation. Agricultural production through crops and livestock supplies urban centers which are unfit for such tasks. However, climate change poses a direct threat to the agricultural industry, as it puts both crops and livestock at immediate risk of issues such as water accessibility, severe temperatures and weather, along with land degradation. Although there are far fewer individuals residing in rural areas, the whole nation will face adversities due to the hardening impacts of climate change on rural America. The National Climate Assessment Review specifies, “Because many rural communities are less diverse than

urban areas in their economic activities, changes in the viability of one traditional economic sector will place disproportionate stresses on community stability" (2014). Although it may seem like climate change targets only one sector of American community, that is not true – the entire stability of the nation is at risk.

There is also a social justice aspect to climate change that often goes unanswered: What will happen to the most vulnerable? Will their lives continue to be compromised at greater risk than their wealthier counterparts? In this transnational scope, nations are already facing this great debate. Some countries have called for the primary greenhouse gas contributors to pay reparations to developing countries facing the consequences of the inescapable climate change. This idea was discussed at the COP27 climate summit, which noted, "For more than three decades, developing nations have pressed for loss and damage money, asking rich, industrialized countries to provide compensation for the costs of destructive storms, heat waves and droughts fueled by global warming" (Plumer et al., 2022). However, powerhouse countries, like the United States and China, have feared the monetary liability associated with this proposal, leaving many developing countries to succumb to the ruin initiated by these developed states for releasing greenhouse gases at such a tremendous rate. When moving this overarching scope to look solely at how this will impact the United States, it is significant to note that if there is only reactionary aid sent to places already facing the hardships of climate damage, there is and will continue to be a disproportionate impact on vulnerable communities.

Geography and Regional Differences

The geographic areas closer to the equator will face the most immediate impacts of global warming, meaning Southern U.S. will be the first region to notice more frequent and intense weather patterns relating to climate change. Within the South, coastal properties will be the first

to drastically suffer. As sea levels continue to rise, coastal regions are faced with land erosion, ultimately increasing the likelihood of flooding (Muro et al., 2019). These areas are also the most at risk of hurricane damage, given their vicinity to large masses of water. Northern U.S. will have more time than the South before daily temperatures become unlivable since this region is farther from the equator. However, the Northern areas will see an increase in immigration from Southern America as the land in the South becomes less habitable from said unlivable temperatures, flooding, drought, food scarcity, etc. (Lynn et al., 2011). The population balance in the United States will certainly shift towards a more Northern-based country if the current emissions continue to be produced at such an exceeding rate.

In the short-term economic effects of climate change, Southern and Midwestern U.S. will face the most damage, while some of Northern and Western U.S. land will actually reap more benefits. With mortality, for example, "Southern and Midwestern populations suffer the largest losses, while Northern and Western populations have smaller or even negative damages, the latter amounting to net gains from projected climate changes" (Hsiang et al., 2017, p. 1364). Various factors contribute to mortality rate, many of which will be impacted by climate change. Southern and Midwestern U.S. will face the impacts of hurricanes and flooding, drought and water scarcity, and heat waves more so than their Northern and Western counterparts initially. But the outcome is not entirely linear – just because climate change may benefit a specific geographic region in one way (i.e., mortality), the benefits are not solidified in longevity. Especially with less land available for people to live on, the Northern and Western U.S. will not only increase in population density from Southern Americans, but also from other countries residing near the equator.

With an increased risk of climate-hardships in the Southern region, cost of living will greatly increase while Southern GDP declines. Facing these unexpected natural disasters takes a toll on the economy: “The worst-hit counties — mainly in states that already have warm climates, like Arizona or Texas — could see losses worth 10 to 20 percent of G.D.P. or more if emissions continue to rise unchecked” (Plumer & Popovich, 2017). Resulting in an increase in energy bills and property insurance alongside the increasing temperatures and property damages, many southern areas will become too inhabitable for Americans. The only people who will stay will be one of two categories: the wealthy who can afford to pay for all the externalities, or the indigent who cannot afford to leave. Without the means to leave the Southern areas most impacted, the poor are left with few options but to face the dire consequences that compromise their housing, labor, and economic reality. Hsiang et al. note, “Because losses are largest in regions that are already poorer on average, climate change tends to increase preexisting inequality in the United States” (2017, p. 1364). Climate change exacerbates the inequalities rooted throughout America, which often results in the wealthiest or the poorest remaining in the most climate-impacted areas.

Agriculture is another area of contention that will need modification in order to ensure productivity. This will have a greater impact on rural areas since these are the primary contributors to American agricultural production. The EPA notes that temperature changes will affect agriculture in various ways, ranging from pollination cycles to crop irrigation. The intense, damaging rainfall more common as climate change progresses is destructive to crops by “eroding soil and depleting soil nutrients. Heavy rains can also increase agricultural runoff into oceans, lakes, and streams,” ultimately harming water quality (2022). By impacting resources the entire nation is reliant on, this poses a risk to both the economy and food security.

Despite the scientific information explaining the implications of climate change, public opinion is not necessarily solely influenced by this. Currently, Southern U.S. is facing the most climate-hardships nationally, but the Southern polls do not reflect the desire for electing politicians in favor of more green-centered practices. Is climate change an issue of low salience for most voters? Are people in the South in denial of climate change? Yet even this raises the question: Why would the states facing the harshest effects of climate change continue voting Republican?

Public Opinion and Partisanship

Political issues thrive on their tangibility and definitiveness, which climate change lacks quite significantly in. For example, political agendas often focus on topics such as taxes and employment, which are relatable to all constituents and seem like primary, essential lifestyle factors. The environment, on the other hand, is a difficult concept to grasp and rally public support for due to its universality and its seeming limitlessness, coining a low salience viewpoint in politics (Basseches et al., 2022, p. 1-2). In a survey on public opinion of climate change, not only does concern for global warming rank extremely low on national surveys, but it also remains unclear to the American public if the environment is already in danger (Egan & Mullin, 2017, p. 213). The scientific literature not only notes the reality and dangers of climate change, but it urges nations to limit fossil fuels and greenhouse gases emissions sooner rather than later. Despite the literature, partisan lines continue to play a large role in the climate change debate.

Although direct and individual experiences with natural disasters do influence perception of the severity of climate change, studies show that opinions continue to vary greatly according to partisan lines. Basseches et al. note this in their report, which states, “Direct experience with extreme weather is perceived differently by Republicans, Independents, and Democrats, with

Republicans typically understating the seriousness of their experiences, and Independents most sharply swinging with recent weather" (2022, p. 6). While personal, lived experience and exposure plays a role in the public's perception of climate change and its severity, partisan lines are also a variable which influence outlooks on climate change. The liberal Democrat ideology has the highest percentage of voters (over ninety percent) recognizing climate change as a current issue, while the gradient slides to the opposite side with the conservative Republican ideology, which has the lowest percentage of voters (less than half) recognizing climate change (Leiserowitz et al., 2018, p. 7). A similar pattern is reflected in the concern surrounding the issue. But if the literature is conclusive in the definitiveness of climate change, why is this a partisan issue in the first place?

Political issues conflict with each other when there are different theories and opinions on how regulations should be approached. Although there are certainly different regulatory options that aim at the reduction of contributing factors of climate change, the necessity is to reduce, not ignore. But those ideologically conservative and of Republican partisanship have largely identified the right political platform as climate denialists. Jackson (2021) elaborates that the idea of climate change began controversial due to scientific illiteracy. Because the scientific community initially did little to create understanding within the American public, the issue became more politically based rather than scientific, hence the controversy. Media, which is the most common platform for expressing political viewpoints, granted both partisan opinions as equally valid, reinforcing the idea of climate denialism (Jackson, 2021). This is further politicized by how pressing the issue is – compared to other political platforms, it is not of the utmost concern.

Although partisanship does influence personal positions on the view of climate change, some sources show that the overall American sentiment surrounding climate change is not as polarized as the nation has been on other previous issues. Rather, there seems to be greater fluctuation and uncertainty surrounding America's public sentiment surrounding the environment:

> "Turning to individual-level opinion, attitudes about climate change divide less clearly along demographic lines than for many other policy areas…the population affected by climate change is diffuse and difficult to define. Vulnerability to climate change risks—a function of both geography and personal circumstances—is widely dispersed across the population, and many who experience climate change consequences do not attribute them as such" (Egan and Mullin, 2017, p. 214).

This was also noted in a survey, where public sentiment from 2015–2020 surrounding climate change in the predominately conservative Republican states of Utah and Idaho showed a greater indication of worry about climate change than residents in the largest Democrat states (Marlon et al., 2022, p. 6). This implies that lived experience and geography may play largely predominant roles in one's perception of climate change.

Some of the same literature suggests that partisanship plays an essential role in the polarization of public's perception of climate change. A study ranging from 2008–2020 notes:

> "The largest change in climate opinions nationally occurred between 2008 and 2010 during the Great Recession, when beliefs and policy support dropped dramatically, due largely to 'political elite cues' associated with the rise of the Tea Party and conservative reaction to the Waxman-Markey cap and trade climate bill. In general, more liberal states show larger increases than more conservative states, which reinforces evidence for the

> importance of ideology and partisanship in determining climate opinions" (Marlon et al., 2022, p. 8).

The combination of both lived experience and political ideology contribute to the American's perception of how climate change is perceived. But having personal experience with severe climate-hardships does not always indicate that individuals will be more inclined to support policies in favor of climate change. Part of one's lived experience must also account for work and income.

Job security and the state's economy have been linked to how the public perceives climate change also. The study spanning from 2008–2020 elaborates, "The much more limited increases (or even declines) in climate views in states with economies closely tied to fossil fuels, such as Wyoming, the Dakotas, and West Virginia, point toward concerns about job security and economic activity that can influence individuals' climate views" (Marlon et al., 2022, p. 8). Personal experience and concern for the future can certainly dictate perception of climate change and political viewpoints. This is also reflected in state legislature, where Basseches et al. note, "many of the states most dependent on fossil fuel industries have among the weakest environmental policies (e.g., Wyoming, Alabama, North Dakota, West Virginia, Louisiana)" (p. 6). Furthering this, although public belief in and perception of risk from climate change increased in almost every state from 2008–2020[3], there was no general movement in how the public viewed this should be displayed in terms of legislative approaches and action (Marlon et al., 2022).

States that are strongly conservative and Republican are generally going to face a decrease in GDP. Muro et al. (2022) add, "By the late 21st century Republican-voting counties

[3] Except Wyoming and West Virginia

are projected to experience damages ranging as high as 28 percent of their income under business-as-usual pathways." While the more liberal ideology clashes with the conservative on the extent of climate change, the reality is that neither side generally tackles major legislation to address climate change in its totality. This may be due to the polarization of partisan lines or the low salience often produced, despite the clarity of the scientific literature. Lived experience is certainly a factor that must be considered when looking at how to approach climate change in the future, as it creates a more tangible, understandable concept to the individual when it generally appears to be such a large and incalculable idea. Although lived experience allows for personal accounts regarding climate change, the media and elitism also drive the narrative in the national and transnational scope surrounding this issue.

Media And Elitism

The media not only fosters a way for information to be spread across the nation but also plays a large responsibility in how this information is presented and the validity behind it. Furthering Jackson's (2021) claim, the media not only previously chose to present both climate change and climate denialism as equally valid, but it reinforced these claims according to inaccurate assumptions surrounding the topic. *The Guardian*, for example, has an entire website page dedicated to "Climate Science Skepticism and Denial," and several major news programs have published refutations of climate facts, specifically those posed from the International Panel on Climate Change (IPCC) (*Climate science*, 2023). By granting these unsupported claims a platform, articles of this nature continue to reinforce biases held by those in denial worldwide. The American public' sentiment towards media coverage of climate change is significantly split. Funk and Kennedy (2016) state, "Some 47% of U.S. adults say the media does a good job covering global climate change, while 51% say they do a bad job. A 58% majority of people

following climate news very closely say the media do a good job, however" (p. 48). American media certainly presents climate change differently to the public than other nations, which may influence why it is such a low salience issue in the U.S. compared to other countries closer to the equator.

The reputable journal *Nature* compiled a study on how often different countries presented climate change on mainstream news channels. During the release of the IPCC's 2021 report, the study indicated that mainstream American news covered a span on 39 minutes, where mainstream British channels covered 72 minutes (Painter et al., 2023, p. 3). The sentiment in right-wing media was significantly more critical surrounding the report than the general sentiment of mainstream media, ultimately arguing skepticism around the presented facts and the desire for government restraint (Painter et al., 2023, p. 3). Furthering this, American right-wing media linked climate activism with Marxism, and noted that the concepts would make "general lifestyle impediments," like the "loss of individual liberties (e.g., having to stop flying or eating meat)" (Painter et al., 2023, p. 6). This ultimately reinforces the partisanship divide on sentiment around climate change. According to the World Economic Forum, the United States ranked as the fourth lowest country (out of 30) trusting scientific climate change facts as accurate, with less than 45% of the public accepting of the presented facts (Whiting, 2020). It appears that the American public certainly believes there is a lack of transparency and certainty surrounding the information of the environment presented by the media.

The role of elites and their influence on media must also be a considered factor. Basseches et al. (2022) explain, "Media coverage of climate change, which is heavily driven by elite cues, is likely to shape public attitudes. Research on media portrayals of science-based issues shows that quantity and content of media coverage influences state-level agenda-setting"

(p. 5). The fossil fuel industry, which has a reported $4 trillion profit in 2022, has an ever-present influence on media and politicians, given their history with electoral campaign contributions and the promotion of climate denialist claims (*Oil and gas*, 2023). Agenda seeding by the fossil fuel industry allows for disinformation to continue to have a voice in the media, creating the perfect opportunity for more polarization of partisanship. Scientists urge the transition to green, renewable energy due to the emissions from fossil fuels and their impact on the warming climate. The fossil fuel industry, which will face dire economic issues as green energy is mandated, can dissuade the public from advocating for this switch by sewing fear and doubt within the media, and therefore, elected officials. Basseches et al. (2022) mention this in their article by noting that "the political economy of the environment often generates a 'race to the bottom,' with some states competing for fossil fuel companies to develop their energy resources" (p. 6). With the monetary support the fossil fuel has towards both media and the campaigns of elected officials, it certainly allows them to have more power and influence over the information given to the public.

Another influential elite dissuading the transition to renewable energy is the World Bank. The high costs of switching current production to more environmentally sustainable practices is the primary cause for resisting the scientific facts. Colman and White (2023) address the World Bank's position as the desire to "squeeze more out capacity out of its existing resources" (Colman & White, 2023). Although the transition to renewable energy is costly, it would actually help get to the root of the World Bank's focuses: food and energy insecurity. By refusing to make a transition to renewables, developing countries will continue to face food and energy insecurity along with increasing temperatures, rising sea levels, etc. Elitists like the World Bank are often opposed to the liberal ideology's push for more climate friendly practices from an economic standpoint and state that it is an overreach of government regulation.

Nationalism & Citizenship

With the diverse geography of the United States, personal experience with climate change is different in the various regions, as climate-hardships each face are not uniform. There are direct links between geographical residency and a shift in climate change perception: "Many state-level climate opinion shifts are consistent with observed heterogeneous climate impacts relating to heat, drought, and flooding" (Marlon et al., 2022, p. 9). Individuals in states that experience more natural disasters are more likely to associate risk perceptions with climate change, which indicates that lived, personal experience plays a role in public perception of climate change. However, there certainly is an influence from partisanship, media, and elitism towards American sentiment around the issue as well. Muro et al. (2019) emphasize that climate-hardships end up impacting the most conservative, Republican communities the most. Whether it is due to cognitive dissonance, economic factors, partisanship, or most likely a collection of all three, it is difficult to pinpoint why conservative states facing climate-hardships continue to vote along partisan lines that do not have policies urging to protect their communities. Ultimately, I believe these states continue voting in the manner they do because climate change is not an issue that has significant influence over their vote. Regardless, it is true that individual experience to does have an impact on one's perception of climate change.

Although American encounters with geography and climate change are not sewn together into a complete, identical national experience, places with a greater predisposition to climate-hardships will need the support of those who initially are faced with less adverse conditions. Climate change is not avoidable or unlikely, it is a fact. Americans will have to decide how those most impacted by climate-hardships should receive aid, both in the nation and around the world.

But even more glaring is the unavoidable question that Americans will have to answer: How will America treat the most vulnerable?

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