Research Article

# Redefining Climate Change as a National Security Issue: Local Climate Adaptation as a Communicative Point

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## Abstract

Climate change is already taking a toll in the United States and globally and thereby threatens public safety and challenges national security. This reality requires educating the American public about climate change in tandem with security. However, climate change is not usually associated with national security to the public, although the climate security framework may accelerate to buffer the combative posture from the climate-dismissive and reduce polarization amongst political parties. In this study, we seek to provide an in-depth understanding of barriers to climate communication by bringing together climate politics and communication literature. We identify information silo effect and ideological factors that cause both conservative and liberal individuals to believe a certain way about certain issues and use motivated reasoning to justify those beliefs. We also suggest a potentially viable way to educate people about climate change and expand the notion of national security in public discourses. We argue that to help individuals see climate change as a security issue, climate communication should focus on fostering community resilience with local climate issues. In this way, policymakers can avoid getting trapped in an infinite loop of debate about climate science and overcome polarization while helping communities understand climate change as a national security issue and adapt to climate-induced impacts on ecosystem and community viability.

## Keywords

National Security, Climate Adaptation, Motivated Avoidance, Climate Communication Barriers, Information Silo, Ideology

## 1. Introduction

Climate change is a U.S. national security concern. The effects of climate change have been frequently reported with many unavoidable climate-induced challenges such as flood inundation, drought, hot and cold temperatures, extreme weather conditions, and sea-level rises in the United States and abroad [18]. In the face of such threats, along with food and water insecurity, the U.S. Department of Defense (DoD) issued National Security Strategy (NSS) that defines climate change as 'an urgent and growing threat' to the country. NSS clearly states that climate change contributes to increased natural disasters and conflicts over basic resources such as food and water [12].

Climate change, however, appears not to be fully accepted as a national security issue by the general public. Unlike traditional national security issues such as terrorism, which ranks much higher on the list of Americans' top public policy priorities [38], climate change remains polarized, and people are less likely to discuss or are open to learning about the changing

climate as a national security issue. As a possible reason, scholars indicate that people generally tend not to engage with controversial policy issues [10, 14], which reflects "motivated avoidance." Motivated avoidance is a social psychological phenomenon in which people who know very little about an issue such as economic downturn, changes in the climate or dwindling fossil fuel reserves insulate them in their ignorance, rather than choosing progressive, active social learning [22, 41, 44, 45]. People instead put their hope into legitimate entities like governments or scientists and believe that they would solve the problems [10, 22, 44].

Motivated avoidance observed in the US raises the question of what drives public perception and disengagement with climate science and why that has been perpetuated for so long. Some studies in climate communication indicate that people are often discouraged by fear-inducing messages [30, 37, 48] and people who deny climate change as an immediate threat or a fact are more likely to be attentive to climate-related misinformation and impart it [5, 10, 23]. In this vein, simply enhancing climate publicity or communicating climate change as a national security concern would not reduce motivated avoidance [15, 44]. It is also suggested that when it comes to scientific communication, there is not a single, monolithic public, and a better understanding of different audiences for science is essential [9, 23, 42]. It is therefore critical to answer how to make a unified understanding of climate change among different publics.

The purpose of this study is twofold. First, we seek to provide an in-depth understanding of barriers to climate communication by bringing together climate politics and communication literature. Second, we suggest a potentially viable way to educate people about climate change and expand the notion of national security in public discourses. For instance, in places like Charleston, South Carolina, and Marquette, Michigan, where there are large socially conservative populations, beginning a public dialogue that focuses on the causes and effects of climate change may worsen climate polarization rather than drawing consensus on the climate change national security imperative. However, residents of both cities recognize that things they all value human health, property, infrastructure, vital services, natural resources, and their local economy are threatened by climate-related impacts, like sea level rise (in Charleston) and extreme cold temperatures in late fall/early winter (in Marquette). Such a communication approach to focusing on the local impacts of climate change on communities is more likely to be successful because people perceive it less as an invitation to "change teams" and more as an effort to support their values and motivations and protect their communities [10]. This approach may help facilitate consensus-building for climate policy actions [13].

This article proceeds as follows. In the following section, we discuss the cognitive, ideological, and political barriers associated with the climate-dismissive community and how media information has been, and remains, an essential tool in combating and also empowering these barriers. We then dis-cuss using community resilience as a communication mechanism to minimize issue polarization, provide concluding thoughts, and transform the discussion of climate change into a national security dialogue. In doing so, we advance the discussion of how to more effectively communicate about the climate issue with a broader perspective on national security while minimizing polarization.

# 2. Understanding Barriers to Climate Change Communication

Climate change threatens the health and vitality of communities, and its impacts range from greater heat stress on humans to loss of natural resources and damage to services and infrastructure. The earth's average surface temperature is rising at an unusually rapid rate and human greenhouse gas emissions (GHGs) are known to be as the main cause. From heat waves that cause drought and very heavy precipitation that causes flooding, to more frequent and widespread wildfires and rising sea levels, human and natural communities and ecosystems are already experiencing the impacts of climate change. According to the latest report from Intergovernmental Panel on Climate Change, scientists project the impacts are very likely to worsen over the course of this century, and beyond [18].

In order to more effectively communicate the security implications of climate change to the public, information about observed and future climate impacts must be relayed in a way that overcomes "information silo" effect and "ideological divide" at the individual and community levels. Large-scale efforts at the federal, state and local levels must strategically present the implications of climate change through the values and opinions that the climate-dismissive community already possesses rather than attempt to change their minds, which would very likely face resistance in media, politics, and casual interaction.

## 2.1. Information Silo Effect

There is widespread public access to climate information, but the topic is politically charged. The saturation of biased information impedes effective communication about the national security implications of climate change. However, the science community has observed key real-world indicators of temperature anomalies, large increases in atmospheric GHG concentrations, increases in the ocean's heat content, unusually rapid melting of glaciers, ice sheets, and sea ice in the Arctic, a rapid rise in average global sea level, changes in terrestrial and marine ecosystems, and a northward migration of many species, including pests, pathogens, and harmful invasive species, etc. [18].

Commensurate with the surge of research, there has also been a significant growth in websites that provide climate information. In 2015, there were approximately 35 million websites dedicated to imparting climate change information

[10]. Some of these sources support the scientific consensus that the Earth is warming and human emission of GHGs is the primary cause, while others claim that climate change is not real or, if it is real, that humans are not to be blamed and that climate change is not a threat.

For the most part, mass media do little to help the public move past this communication problem, because TV and news reports often portray climate change as a debate. In January 2014, Bill Nye the Science Guy debated Fox News' Marc Morano about the existence and threat of anthropogenic climate change. Many argue Morano won that debate, not because he presented better scientific information, but because of his communication style. He was more emotional with a more assertive tone, but many people found his arguments more convincing. What this debate revealed was that science is not enough, and the presentation of the science is also critical. Additionally, the debate forum skews public opinion by creating a false perception that climate science is not a fact, which can hinder effective policy discussion on the subject [20]. Ultimately, an inability to have a thoughtful public discussion about the security and safety implications of climate change impedes the public's ability to participate in productive brainstorming and dialogue on possible solutions to local, regional, and national climate related problems.

Motivated by a desire to be, and to be perceived as, unbiased, media tend to invite skeptical political pundits or scientists holding a minority view to offer a counter-point to a scientist who represents the climate-concerned community. Consequently, the media (including social media) presents the climate-dismissive individual as having the same authority and "weight" as the climate-concerned scientist, thereby artificially inflating the credibility of the skeptic and reducing the amount of influence the scientist can have in educating the population about climate change [4, 5]. The media is a direct factor in influencing public opinion on climate change, while it is an instrument for gauging the views of peoples' political party affiliation and their ideology [8].

Framing the issue as a "scientific debate" does not accurately represent the consensus among the science community [14, 20]. Nevertheless, some reporters divert their audiences' attention from valid, authoritative scientific information towards faulty literature or more emotional correspondents in pursuit of higher ratings, thus hindering effective climate policy-relevant dialogue and decision-making [6]. In reality, however, there is overwhelming consensus among the climate science community. Over 97 percent of climate scientists acknowledge that human emission of GHGs is causing Earth to warm at an unusually rapid rate [4].

Ironically, there is no consensus among members of the climate-dismissive community about climate change. Some argue Earth is not warming and their strategy has been to attack or reject the observational record. Some argue Earth is warming, but our world has warmed and cooled throughout its history. Others argue that Earth is warming due to a combination of natural and human causes, and they cannot say for

sure how much is due to which cause. The overarching strategy, however, is to undermine confidence in the consensus view of the climate-concerned community by continuing to spread the misconception that "the science is not settled" and remains a matter of debate [4].

Some research suggests that the greater quantity of media coverage of climate change would lead to the greater level of public concern, inferring Quantity of Coverage Theory [8, 26]. Quantity of Coverage Theory states the amount of media coverage directly impacts how much people care about an issue. According to a recent study in climate communication, less than half of Americans report climate change in their media "only once per month" [26]. In this case, climate change is an underreported issue. For six years, Climate Central's *Climate Matters* program has worked to increase climate change coverage through the recruitment of TV weathercasters, whom most people trust, and who provide most Americans with their greatest exposure to scientific information. The study found that viewers of weather segments that used *Climate Matters* materials learned more about climate change [26].

However, learning does not necessarily beget belief. There is a reputed view in that the more frequent coverage of climate change may result in the more polarization of the issue [17]. With the overflowing climate science information, the public appears to preferentially seek media that most align with their beliefs while rejecting those media that do not align [10]. This creates an information silo effect. The information silo effect refers to the tendency of belief-holding individuals to selectively accept or reject information provided to them based upon their beliefs [10]. As a result, increased exposure to climate change information alone is unlikely to solve the issue, and may even further discourage constructive discussions about climate policy formation.

Such biases in attentiveness to science in media are influenced by a variety of factors – one of which being level of formal education. There are differences between how young children and adults educate themselves. While young children receive formal classroom education, adults largely receive information through media sources outside of the classroom. However, American adults' attentiveness and respect for scientific information is largely correlated with the level of scientific coursework they took in high school and college. The more coursework adults took in school, and the more advanced coursework adults took in school, has a connection to adult understanding of the science, value of the science, and regular consumption of the science as adults, and this plays an influential role in the climate change discussion [28].

However, level of education – particularly scientific education – does not guarantee that adults will consider anthropogenic climate change real or even a problem. Since 2012, it has been clear that both the climate-concerned and climate-dismissive communities have well-educated members [28]. Ideology deters even the most educated from believing in the science [19]. There are educated religious fundamen-

talists, but knowledge of the science does not guarantee value of the science or belief in the science. Just because an individual could pass a test on climate change does not mean they agree with the scientific consensus on climate change [28].

Still, adequate communication begins with the ability to distinguish between information and misinformation, which formal education is supposed to help develop. It is imperative that formal science educators teach their students how to distinguish credible from non-credible sources of information – a skill known as media literacy. Members of the climate-dismissive community are more likely to perceive counterpoints made by rightwing think tanks as having equal weight as assessments from the U.S. Global Change Research Program or the National Academy of Sciences. Without media literacy, accurate information may not be understood and may lead to public misunderstanding or denial, which will very likely result in continued opposition.

In order for scientists, science communicators, and science educators to effectively communicate climate science to the general public, the public must be taught the essential principles and fundamental concepts of climate and media literacy in the classroom. Learning media literacy enables people to discern credible from non-credible sources, so that students can discern fact from fake news. However, teachers – around the world – face an increased workload and less time to familiarize themselves with new material, which decreases the motivation of presenting material that updates the current curriculum on climate change [24]. In fact, if new material requires too much time for educators to familiarize themselves, it may not be used at all [24]. Educators can integrate popular media into the classroom as a tool to offset the pressure of learning new material.

As a result, media play a significant role in the climate change discussion, especially in how people interpret climate information, because it can either empower the scientific understanding of climate-concerned individuals or entrench the skepticism of climate-dismissive individuals [10, 14]. Additionally, media can further entrench individuals in their ideology, creating the perception that people can rely on their ideology as a source of hard evidence. It is not likely to convince members of the climate-dismissive community to recognize or agree with the climate-concerned – it will instead likely alienate them more [14]. However, if there is increased coverage of climate change in a way that publicizes solutions to climate-related events, in language that does not present climate change as an ideological argument, then communication is more productive, relatable, and profitable to more demographics [10].

Even if media communication and education improve, peoples' ideology against climate change will not necessarily change. While the American people largely agree that national security and public safety should be high priorities for the government, many do not associate the issue of climate change with safety or security. Some of the brightest people with the most advanced degrees have dismissed the climate threat. Such intelligent people probably know the climate science information very well, but they may simply deny the science because it disagrees with their values. They may also selectively accept science that agrees with their biases and reject the science that does not [10, 14]. Therefore, public opinion surveys on climate change may be a better indicator of *who these people are* rather than *what they know*. This requires understanding of how ideology impedes climate communication.

## 2.2. Ideology: Individual and Communal

Communicating climate change as a national security issue is problematic because many people do not associate climate change with security. This is largely due to peoples' risk perceptions and value orientations. The perception of climate change is largely influenced by values, which are often shaped by political party affiliation. Political parties represent the fundamental values shared by party members. The Democratic Party largely favors policy actions that promote economic equality and broad social welfare programs, whereas the Republican Party largely favors policy actions that seek to limit government regulation and reduce government involvement in the free market.

Republicans are, therefore, likely to perceive that government policies to reduce GHGs will hurt the economy, eliminate jobs, and constrain the free market. Democrats are likely to perceive that reducing GHGs will prevent more extreme weather, save lives and infrastructure, and bolster the economy. Thus, today's political polarization comes down to different values that drive diverging risk perceptions.

Climate change is among the most politically polarizing issues in the United States. Measuring political ideology, research shows that there is a divide in the American public as there is between politicians, and the divide is expanding [27]. The lasted poll by the Pew Research Center supports the growing polarization, as 78% of Democrats describe climate change as a major threat to the country's well-being, up from 58% a decade ago, but only 23% of Republicans consider climate change a major threat, a share that's almost identical to 10 years ago [38]. The increased polarization is likely due to the mixed information people are receiving about climate change on both sides of the political spectrum [27]. Because of this polarization, mainstream media about climate change must be purposefully worded to help people educate themselves about this issue. Therefore, framing is an important mechanism for educating the public on climate change. How global climate change is communicated to every ideological demographic in everyday discourse is arguably more important than science itself [10, 43].

One suggested approach to communicating climate change is to connect the issue to something that the public cares a great deal about. While climate change is on the list of Americans' top 20 public policy concerns, it sits much lower than issues such as terrorism, the economy, jobs, health, ed-

ucation, and even the environment [39]. Even the environment is not as polarizing among Americans as climate change is, despite the direct relationship between the two. Therefore, launching a coordinated communication campaign about climate change through the lens of one or more of these more salient issues may be more successful due to a smaller partisan divide [27, 39]. For instance, showing how particular adaptation programs create jobs while improving the environment may be a more effective method of engaging the public than focusing on how GHGs will cause an increase in heat-related deaths in the next 100 years.

Communicating climate change to people in a way that aligns with their existing values and priorities is vital, because human beings process information subjectively. Human beings most likely answer questions about politicized issues in accordance with their beliefs, since those beliefs are formed as a result of their personal experiences and the experiences of people they trust [19]. There are ideological and cognitive factors that cause both conservative and liberal individuals to believe a certain way about certain issues and use motivated reasoning to justify those beliefs.

To demonstrate that this dynamic of "motivated reasoning" actually occurs, Dan Kahan, a cultural cognition professor at Yale University, conducted an experiment in which he compared participants' interpretation of the exact same data in two different scenarios to see how the scenarios influenced interpretation of the data. In one scenario, Kahan presented a two-row-by-two-column grid of data indicating how many people with a skin rash used a medicated cream and recovered or became worse, and how many people who did not use the medicated cream recovered or became worse. Kahan also asked questions to help him measure each participant's "numeracy" (i.e., their ability to work with numbers and reason mathematically) as well as their political orientation. In the skin cream scenario, Kahan asked participants to determine from the data whether the skin cream caused the rash to improve or worsen. Regardless of political leaning, all of the participants generally answered the same and the percentages of both Democrats and Republicans who gave the correct answer improved as a function of numeracy [19].

Another equal-sized cohort of participants was asked to interpret the exact same data in a politically polarized context. Specifically, they were asked to determine whether a ban on carrying firearms in some cities caused crime rates to improve or worsen as compared to crime rates in cities that did not ban firearms. In the gun ban scenario, the participants' answers diverged. Democrats continued to answer correctly as their numeracy score increased whereas the percentage of Republicans giving the correct answer decreased as a function of numeracy. The study concluded that context matters, and that people are willing to use different reasoning heuristics (other than math and science) in scenarios where their values are at stake.

Ideology is derived from religion as much as politics but could serve as a potential tool for communicating the im-

portance of doing something to stop climate change. When it comes to climate communication, the US public appears to be diverse and can be split into six groups. The groups represent the six ideological demographics in the United States divided by their level of concern about climate change, ranging from Alarmed (17 percent), Concerned (28 percent), and Cautious (27 percent), to Disengaged (7 percent), Doubtful (11 percent), and Dismissive (10 percent) [40]. Despite the division over climate change, all six character types had some level of spirituality or religiosity. As such, there is some rationale for presenting climate change as a moral issue, since it impacts the most underrepresented and least developed populations around the world and in the United States.

However, only Alarmed and Concerned people view global warming and climate change as moral issues [23]. As a result, the study concluded that before people can believe climate change and global warming are moral issues, they first have to believe in climate change and global warming, and believe that they are issues. [23]. More spiritual leaders, like the Pope and local clergy, should communicate the dangers of climate change in order to transmit the message across the six Americas, as Pope Francis did in his encyclical on climate change [23]. Therefore, not only does the method of communication matter in relaying the climate change science, but also *who* is communicating – a foundational concept to the *Climate Matters* program, which uses TV weathercasters as an apolitical platform for climate communication [26].

Therein lies the question: How can communicators educate about the national security implications of climate change to people whose ideologies differ? How can communicators overcome the ever-expanding information silo effect that hinders understanding and a willingness to accept authentic evidence of climate science? How do you educate people who do not necessarily believe they need to be educated? A plausible solution may be to increase coverage about the health, economic, security, and job benefits of preparing for climate-related events, which are the issues Americans care the most about. Instead of focusing on the broader issue of climate change, it may be more effective to highlight successful climate adaptation programs that have mitigated the risk of harm while producing beneficial outcomes in one or more of those issue areas. In doing so, the climate-dismissive community does not feel their values are threatened. In fact, their values are empowered.

## 3. Climate Adaptation for National Security

National security is not limited to defense or intelligence-related matters – but that is how it is discussed. Climate-related events have contributed to humanitarian crises worldwide, while adversely impacting the economic viability of Americans here at home. Communities are devastated by hurricanes and floods, sustain financial losses caused by

drought, and endure stronger storm surges causing the destruction of critical infrastructure needed to conduct business. These events have the capacity to increase crime rates due to the onset of catastrophic trauma, and these events are driven, in part, by climate change. Therefore, America's national security strategy must address the potential security consequences of global warming and climate change.

Scientists warn that climate change will produce more, and more severe, extreme natural events. Some of these events, like Hurricanes Katrina and Sandy, disrupt local economies, destabilize communities, and displace people. This undermines national security by reducing the capability of America's communities to recover and move forward. If communities are protected against climate-related events and equipped with physical and economic resources and infrastructure to withstand climate and weather-related events, then American lives and money can be conserved, and the nation's security can be reinforced.

But the public generally does not associate actions to improve America's neighborhoods and infrastructural integrity with climate change. As the public continues to miss the link between climate change and securing America's communities, the climate change issue becomes more polarized. Not all Americans are extremely ideological about climate change; 35 percent of Americans are disengaged or cautious about global warming [23]. In one study, respondents from the "disengaged" and "cautious" segments of the public indicated that, if they could ask a climate scientist one question, they'd want to know: "What harm will global warming cause?" The study's authors concluded that one way to motivate these segments of the public would be to promote awareness and understanding of the ways in which climate change poses risks to their health, communities, businesses, and livelihoods – and that there are solutions. Being aware that climate change presents a growing threat, that we have the capacity to stop the threat, and that actions to stop climate change can help save lives and property while creating jobs and boosting local economies is a much more productive way of talking about climate change. This form of messaging focuses attention on real-life, solution-driven stories about local and regional actors around the country, and around the world, who successfully make their communities more resilient to climate-related events.

For example, ironically, climate change may contribute to an increase in frozen water pipes in early winter in Marquette, Michigan. As the fall season's first freeze arrives later in the year there, Marquette residents are experiencing more years when they have no snow on the ground when the first hard freeze arrives. Thus, their pipes are exposed and vulnerable to freezing. Most people do not understand this correlation. Thus, communicators may have more success if they focus public dialogue on actions local residents can take to make their water pipes more resilient to very cold temperatures instead of talking about the more politically controversial challenge of curbing GHGs and global warming. That means climate

communication that aligns with shared core values in local communities may better serve to depolarize people and motivate actions to adapt to and/or mitigate climate-related impacts. Such values include a strong economy, good health, access to essential services, abundant natural resources, reliable infrastructure, and a healthy environment.

The Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and a variety of other U.S. federal agencies have joined forces in order to address the climate change problem while circumnavigating motivated reasoning. Over the past four years, NOAA has developed web-based tools that provide education resources and data to help businesses and communities build resilience to climate-related impacts – tools such as the U.S. Climate Resilience Toolkit (CRT).

The CRT, and NOAA's Climate Program Office publicize successful climate adaptation and risk-mitigation initiatives in different areas around the country. The EPA and NOAA's Great Lakes Regional Integrated Sciences and Assessments team (GLISA) published a report that describes the use of workshops to build effective methods of improving storm-water system resilience to climate and land use changes. The workshops featured NOAA, EPA, and local environmental leaders in the Great Lakes and Chesapeake Bay areas [35]. The workshops addressed methods of improving data collection to introduce climate change into planning, investing in design and construction of green technologies to build local capacity to mitigate climate change, making information on green technologies more accessible to local decision makers to identify and communicate costs and benefits of green infrastructure, and navigating existing methods and regulatory designs to work within the current government structure.

Furthermore, the CRT publishes stories and reports from around the United States that highlight the achievements of local and regional governments, communities and businesses that are taking action to build resilience to climate-related impacts. For example, in Minnesota, a Heat Resilience Toolkit was created to advise residents on best practices to keep themselves safe and prepared during heat waves [31]. In Oahu, the Hawaiian government decided to rebuild the state's historical sand dunes that once lined the islands' shores in order to combat shore erosion, flooding, and property damage [33]. In Chicago, where tree canopies hang lower than in many other cities in the Midwest, the Chicago Regional Trees Initiative staff were trained to properly plant trees for the fortification of urban forests to provide more shade and more evapotranspiration to counter the urban heat island effect resulting from rising temperatures [34].

Educating communities about adaptation to build and reinforce community resilience is much more effective than attempting to argue whether or not the "science is settled" about global climate change. Climate change does directly and indirectly impact jobs, the economy, healthcare, security, and the environment, but many people do not see the association. Hur-

ricane Harvey caused over $10 billion in insured losses, about one-third of which was strictly due to wind and storm surges, according to the AIR Worldwide catastrophe-modeling firm [3]. Hurricane Irma caused between $20 billion and $65 billion in damages throughout the Caribbean and southeastern United States, and up to $85 billion from Hurricane Maria [1, 2]. Hurricane Irene was the eighth most expensive hurricane in U.S. history ($16 billion) [32]. If U.S. infrastructure in these impact zones were more resilient to hurricanes, the damage the hurricane caused may not have been as extensive or as much of a shock to these communities, many of which rarely experienced hurricanes. Resilience probably would have reduced the need for such a costly recovery effort. It is therefore much more immediately useful to communicate climate science through emphasizing adaptation measures as opposed to debating whether humans are causing climate change.

The topic of climate change may seem irrelevant to people experiencing climate-related effects that they do not associate with climate change, such as sea level rise and increased coastal flooding. Focusing public policy dialogue on viable solutions by which people can protect their property and infrastructure may be a more effective and fruitful way to encourage people to take an action [47]. In Charleston, South Carolina, for example, it may be more effective to ask, "How can we help Charleston reduce flood risk, protect historical landmarks, and avoid spending millions on recovery costs?" as opposed to "How can we keep GHGs from contributing to global warming, which causes sea level rise?" These issues are related, but these questions have vastly different connotations. The mind processes this information differently in politically charged environments, further delaying the implementation of life-changing, life-saving solutions [19].

# 4. Discussion

Many people acknowledge that the Earth is currently warming, but they less likely agree that humans are causing this warming and that the rapid rate of global warming has major security and safety implications on the daily lives of people in communities around the world. Global sea level rise threatens the survival of coastal communities. Drought impacts the availability of potable fresh water resources. Human-emitted carbon absorbed by the oceans causes the oceans to become more acidic impacting marine life and coastal fishing industries. However, explaining the negative impact of these phenomena through the frame of proven climate science may taint the conversation with ideology, rather than motivate ordinary people and policy leaders to take actions to reduce human emission of greenhouse gases [30, 37, 48].

Public attitudes toward climate change have been long polarized in the United States [5, 10, 23, 27, 38]. Traditional education and media coverage about climate change have not been effective in galvanizing the public's political will to address the issue [4, 6, 8]. The frequency of coverage on the issue is not enough to elevate the priority of addressing climate change [26, 14]. Even people with extensive years of formal education may refuse to accept that humans are causing climate change, due to their intense ideology. While climate change alarms some people, others simply do not see it as a threat, and as the climate-concerned community struggles to effectively communicate the implications of global climate change, the climate-dismissive community argues that the science is "unsettled" [10, 20, 26].

Public media encourages this conflict by broadcasting about the debate of climate change as opposed to the science. Additionally, audiences preferentially seek only that information that supports their viewpoints [14, 20]. If the public watches scientists debating the issue of climate change, the debate communicates a false perception of disagreement within the scientific community.

There is little use in focusing solely on the climate change issue if the public does not view it as a priority. The public does, however, view the national economy, jobs, healthcare, and security as key concerns, and to those of us who know the climate science also know that climate change impacts each of these concerns. The primary obstacle is that climate change and global warming are such broad, complex topics and many people do not perceive its direct impact on their communities, nor in the United States as a whole. In this light, we contend that educating local communities to be more adaptable to climate-related events that directly impact them is effective at mitigating many risks associated with climate change, aligning with the values and beliefs of communities, and saving some lives, money, infrastructure, and natural resources in the process.

The CRT, for instance, offers insight into the lives of local populations in the United States as they prepare their communities to abate the effects of climate change, thus demonstrating how adaptation makes communities more resilient, regardless of people's political orientations. The Toolkit offers over 120 case studies from across the nation that show it is possible to engage people in real and effective climate adaptation that did not necessarily require them to change their beliefs about climate change. This educational website could continue to facilitate discussion that will formulate innovative methods of protecting American communities from the current and future harmful effects of climate change [47].

Our belief is that climate adaptation-focused messages may depolarize climate change by strengthening the idea of climate change as a national security imperative, not national security itself in the sense of armed conflict and terrorism, but an existential threat to peace, prosperity, public safety, and the American way of life. Climate solutions in local communities improve recovery and resilience to environmental impact and uphold critical infrastructure. As these solutions become more successful, the general public may see the security and economic value of supporting these solutions [13, 47], thereby expanding the definition of national security beyond terrorism and war to environmental resiliency and public safety. If people collectively rally behind measures to promote national security

and strengthen the general public and policy makers' understanding of climate change as a national security imperative, it will make their communities safer from the harms of climate change.

## 5. Conclusion

It is evident that climate change is a U.S. national security concern. Unavoidable climate-induced disasters witness that climate change not only contributes to increased natural disasters but conflicts over basic resources such as food and water [12]. Despite the urgency of adapting to climate change, the public is swamped with divisive political conflicts mostly being affected by the cliché discussion of climate change being real or humans' contributions to climate change [10, 16, 20]. It is imperative to enhance public awareness of climate change as a national security issue, which raises a question about what would be an effective communication message to the public, particularly to the climate-dismissive group.

This study integrates literature in climate politics and communication and asserts that increased media coverage may not serve as a remedy, as information silo-effect would rather cause the misinterpreted scientific information magnified among the climate-dismissive [10, 17, 30, 37. 48]. Politically charged discussion on climate change is then more likely to alienate people, hinder effective dialogue, and lead to motivated avoidance [16, 23, 14]. We conjecture that providing education to local communities on how to make themselves resilient to climate events may free the public from polarizing debates on whether the science is settled, and help people focus protecting their lives and valued assets.

Future research would benefit from empirical research investigating whether communicating local needs for climate adaptation and actions could help people better understand and accept the scientific consensus of climate change. Another line of research can also explore if peoples' extended understanding of climate change as a national security concern would eventually link to the successful adoptions of meaningful climate policies. Our hope is that this study offers sufficient support for undertaking future research in this area as there is still much to learn about how to circumvent communication barriers to climate change, which will shape climate policy discourses and better promote national security.

## Abbreviations

| CRT | Climate Resilience Toolkit |
|-----|----------------------------|
| DoD | Department of Defense |
| EPA | Environmental Protection Agency |
| GLISA | Great Lakes Regional Integrated Sciences and Assessments team |
| NASA | National Aeronautics and Space Administration |
| NOAA | National Oceanic and Atmospheric Administration |

## Author Contributions

**Jordan Beauregard:** Conceptualization, Formal Analysis, Writing – original draft, Writing – review & editing

**Younsung Kim:** Conceptualization, Formal Analysis, Supervision, Writing – original draft, Writing – review & editing

## Conflicts of Interest

The authors declare no conflicts of interest.

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