

Climate Risks and Resilience at Dickinson College: Health and Wellbeing

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1. Introduction

Climate change in the 21st century is reshaping human interactions with the environment, presenting significant risks to various vulnerable groups. While the impact is broad, this discussion focuses on climate risks and resilience for human health and wellbeing at Dickinson College, the higher education sector, exploring how colleges and universities are addressing these challenges through adaptive strategies and educational initiatives. Additionally, it's crucial to recognize that other groups such as low-income communities, the elderly with pre-existing health conditions, and children also face considerable risks, which require tailored responses and policies. At institutions like Dickinson College, the urgency to adapt and mitigate these challenges is paramount, offering an opportunity to enhance campus safety, inclusivity, and health, amidst the ongoing climate crisis.

Colleges and universities, often embedded within urban and built environments, stand at the forefront of setting standards for climate resilience and exemplary planning on climate change-related issues. These institutions, rooted deeply in education, teaching, and discovery, are well-positioned to leverage their influence for fostering sustainable, safe, and resilient educational landscapes.

This report primarily focuses on evaluating the resilience of Dickinson College and the Carlisle, PA community to climate-related risks. It examines how these entities are prepared to manage and mitigate the impacts on health and well-being, significant concerns under changing climate conditions. In June last year, Dickinson College formally signed the Second Nature's Climate Resilience Commitment, committing to comprehensive strategies for coping with environmental challenges. This initiative is part of a broader collaboration with the local government of Carlisle and Cumberland County, aiming to jointly assess resilience and develop plans to enhance the capacity to adapt and thrive in the face of these challenges.

Second Nature organizes its resilience planning framework into five critical sections: Ecosystem Services, Health and Well-being, Infrastructure, Economic, and Social Justice and Governance. This analysis specifically delves into the Health and Well-being segment, exploring how climate-induced factors such as extreme heat, deteriorating air quality, and the prevalence of mold in buildings are impacting the campus community. By signing the commitment, Dickinson College not only underscored its dedication to sustainability but also enhanced its leadership role within the community in fostering a resilient future.

Interviews conducted with various department stakeholders across campus have underscored the multifaceted health challenges posed by climate change. These range from the direct impacts of heat on physical activities, particularly noted by the athletics department during early summer practices, to concerns about indoor air quality and mold, which are significant for facilities management and campus safety personnel.

In light of these findings, the report investigates innovative solutions and strategies adopted by educational institutions to lead in climate change action and sustainability. This aligns with the goals of Second Nature, which advocates for scaling up resilience efforts through community-based research and innovative climate solutions.

Embracing Second Nature's comprehensive approach, this report highlights not only the vulnerabilities but also the existing strengths and assets of Dickinson College. These include proactive measures already enhancing resilience, such as extensive green spaces that mitigate heat and contribute to cleaner air. Building on these assets is crucial as we formulate robust responses to the anticipated impacts of climate change, ensuring the health and well-being of the campus community remains a top priority.

2. Background Information

Dickinson College in Carlisle, Pennsylvania, has long been at the forefront of sustainability in higher education. Recognized nationally for its rigorous sustainability programs, the college achieved carbon neutrality in 2020, marking a significant milestone in its commitment to environmental stewardship. This commitment is embedded in every aspect of campus life, from green building practices to curriculum development that emphasizes sustainable development and environmental ethics (Dickinson College, 2020).

The Environmental Science Department at Dickinson College plays a pivotal role in fostering resilience to climate-related risks. Offering a robust program, the department emphasizes an interdisciplinary approach that merges natural and social sciences to understand and solve environmental problems. Research within the department spans several relevant topics, such as sustainable agriculture at the college's working farm, conservation biology, and the risks and effects of climate change. These initiatives not only provide practical experiences that complement classroom learning but also directly contribute to the community's capacity to adapt and thrive in changing climate conditions. By preparing students to be leaders in environmental science and policy, the department ensures that there is a continuous influx of informed and skilled individuals ready to implement and advocate for effective resilience strategies within Dickinson College and the broader Carlisle community.

A recent study describes changes in climate hazards in Cumberland County that are projected to result from global climate change (Leary, 2023). These include the increased frequency and intensity of extreme weather events such as heatwaves, heavy rainfall, and severe storms, which pose significant challenges to infrastructure, ecosystem stability, and public health (Leary, 2023). The college's location in Cumberland County is particularly significant due to its unique climatic vulnerabilities and the specific environmental challenges it faces. While Cumberland County does not feature extremely diverse topography, its geographical setting contributes to specific climate impacts such as increased flooding risk, more intense and frequent heatwaves, and agricultural disruptions. These conditions underscore the need for Dickinson College to adopt an integrated approach to resilience and adaptation strategies that

are tailored to its local context. The need for such tailored strategies arises from the county's climatic conditions rather than varied topography. This makes the college's initiatives not just a general necessity but a critical, context-specific requirement to ensure effective management of environmental challenges.

Roughly 100 colleges and universities in the United States have signed Second Nature's Resilience Commitment. Each of them is taking steps to assess climate risks and resilience for their campuses and wider communities, identify and evaluate actions for building resilience, and develop and implement resilience plans. Dickinson can and should examine what other institutions are doing and learn from their experience. For example, the University of Utah's Climate Resilience Assessment offers a comprehensive model that encompasses environmental, health, and infrastructure vulnerabilities, showcasing a holistic approach to resilience that could be adapted to the specific needs of Dickinson College (University of Utah, 2021). This approach includes robust community engagement and a focus on sustainable infrastructure, both of which are pivotal in addressing the broad scope of climate impacts. Similarly, the University of Maryland, Baltimore, has successfully implemented green infrastructure projects and community resilience programs, which include extensive stakeholder engagement and policy advocacy (University of Maryland, Baltimore, 2022). These elements are crucial for supporting sustainability initiatives and could inform similar efforts at Dickinson College.

The adoption of proven strategies from these and other colleges and universities can provide a solid foundation for Dickinson's own resilience planning, ensuring it is both effective and comprehensive. By examining their success in engaging diverse community stakeholders and implementing policy changes, Dickinson can craft a resilience strategy that not only mitigates climate risks but also fosters a sustainable and inclusive campus environment. Emulating these models can accelerate Dickinson's journey towards becoming a leader in climate resilience within the academic community, setting a standard for others to follow.

Currently, Dickinson College's climate action plans are primarily focused on the mitigation of greenhouse gas emissions, as highlighted in our existing policies. However, there is a growing recognition of the need to broaden this scope to include health and well-being within the framework of climate resilience. Inspired by Second Nature's comprehensive resilience framework, our ongoing student research is exploring how integrating public health measures into climate resilience planning can address both immediate environmental threats and long-term health outcomes. This research is examining the increasing occurrences of climate-induced health issues, such as respiratory illnesses from poor air quality and heat-related stress during unseasonably warm periods. Our hope is that this work will inform the next stages of Dickinson's climate action planning, advocating for a more holistic approach that prioritizes the health and well-being of the community alongside traditional environmental targets.

3. Research Methodology

To assess the current state of climate resilience and health initiatives on college campuses, this study employed a mixed-methods approach comprising interviews, questionnaires, and a comprehensive review of the literature. Because the research included the collection of information from human subjects through questionnaires and interviews, members of the research team were required to complete training through the Collaborative Institutional Training Initiative (CITI). This program is specifically designed to equip researchers with a thorough understanding of the ethical standards and regulatory requirements necessary for conducting research involving human subjects. Key areas of focus in the training include confidentiality, informed consent, and the ethical handling of data. Before initiating any data collection, a research protocol outlining our methods and ethical considerations was prepared and submitted to Dickinson College's Institutional Review Board (IRB). The protocol was reviewed and subsequently approved as exempt from further review, affirming our compliance with ethical standards.

During the data collection phase, participants were fully informed about the voluntary nature of the study, how the information would be used, and their rights regarding confidentiality and withdrawal from the study at any time. Informed consent was obtained before each interview, clarifying the aims of the research, the procedures involved, participants' rights, and the measures implemented to protect their data. Additionally, permissions were specifically sought for recording interviews, with clear assurances provided about the security of the recordings and the conditions under which they would be eventually deleted. Participants were also given options regarding how their data would be handled, particularly in terms of maintaining confidentiality.

3.1. Data Collection through Questionnaires

The initial phase of data collection involved distributing a questionnaire to a selected group of 61 employees at Dickinson College, identified for their roles relevant to managing climate risks and enhancing resilience. The survey was administered to college employees whose responsibilities intersect significantly with aspects of climate risks and resilience. The sample included 58 staff members and 3 faculty members. The questionnaire was designed to collect information about the respondents' areas of responsibility related to health and wellbeing of member of the Dickinson community; campus infrastructure and utility services; and ecosystem services, green infrastructure, and stormwater management. This categorization was instrumental in mapping out the specific knowledge areas and responsibilities concerning climate change impacts among these employees. The responses were organized in an Excel sheet, which laid the groundwork for further detailed inquiry through subsequent interviews.

3.2. Interviews

Following the questionnaire, employees who responded were invited to participate in interviews to delve deeper into the specifics of their initial responses. The invitation for

interviews was sent via email, structured to thank the respondents for their initial participation and to outline the purpose of the follow-up discussion. The interviews were designed to be conducted either in person or via Zoom, depending on the respondent's preference, with each session lasting approximately 20-40 minutes.

The interview process utilized a semi-structured format, which combined structured questions derived from earlier questionnaire responses with the flexibility to delve deeper based on participants' answers. This method allowed interviewers to explore in more detail the perceptions of climate risks, the severity of past climate impacts, and potential future scenarios that could affect the college. Additionally, discussions included examining the college's capacity to manage such impacts and the effectiveness of current resilience strategies. The semi-structured approach is widely recognized in qualitative research for its ability to elicit both broad and specific insights, making it particularly suitable for our study's objectives.

3.3. Literature Review

Concurrent with the empirical data collection, a literature review was conducted to establish a broader context for our study. While the review included some research and case studies on climate resilience and health initiatives on college campuses, it primarily encompassed a wider range of institutions and contexts. This broader approach helped frame Dickinson College's activities within a larger spectrum of climate resilience efforts and was instrumental in identifying best practices and gaps in current approaches, even beyond academic settings. Although relatively few of the sources directly focused on college campuses, the insights garnered were pivotal in understanding how various organizations address similar challenges, which in turn informed the development of targeted interview questions and analysis frameworks.

3.4. Data Analysis

Responses from both questionnaires and interviews were analyzed to identify common themes, discrepancies, and unique insights into the climate resilience initiatives at Dickinson College. This analysis contributed to a comprehensive understanding of the current state of preparedness, the effectiveness of existing initiatives, and areas needing further development or intervention.

This methodological framework, combining qualitative and quantitative elements, was crucial in providing a holistic view of climate resilience and health initiatives at Dickinson College and offered a model that could be replicated in similar studies at other institutions.

4. Health and Climate

4.1. Extreme Heat

Extreme heat, characterized by unusually high temperatures that surpass historical averages for a specific region, often results from climate change and human activities. It manifests as extended periods of intense heat, leading to significant repercussions on ecosystems, wildlife, and human health (Hayden et al., 2023). Such heatwaves, a frequent result of these extreme heat events, can induce a range of heat-related illnesses and even mortality.

On college campuses like Dickinson, where academic and athletic activities persist throughout the summer, the community faces heightened risks. The highest temperatures, typically experienced during the summer months, pose significant health impacts, but it is crucial to recognize that extreme heat events can occur from spring through fall. Therefore, ensuring adherence to comprehensive safety protocols during all seasons is vital for mitigating these risks effectively.

Students attending summer classes and faculty engaged in research are particularly exposed to prolonged high temperatures, which have been shown to impair cognitive function, decrease motivation, and lead to lower overall productivity (Heal & Park, 2016). Furthermore, research consistently identifies certain groups as particularly vulnerable to heat-related illnesses, including elderly individuals, young children, those with chronic diseases such as cardiovascular or respiratory disorders that exacerbate their susceptibility to heat stress, and outdoor workers (Smith et al., 2018).

Athletes engaged in high-intensity activities during the hotter parts of the year face a significant risk of exertional heat illnesses (EHI). These conditions range from mild, such as heat cramps and heat exhaustion, to severe, such as exertional heat stroke—a leading cause of fatality among athletes (Gamage et al., 2020; Bouchama et al., 2022). This is particularly relevant for Dickinson's athletic teams, including the football team, which begins practice in early August, often during peak heat.

The campus health initiatives must focus not only on general advisories but also on specific measures tailored for these high-risk groups. This includes scheduling outdoor activities during cooler parts of the day, ensuring adequate hydration stations are available, and providing training for staff and students on recognizing and responding to signs of heat-related stress.

Dee Danser, the head of the Dickinson Public Safety (DPS), highlighted additional concerns during an interview, noting the difficulties her team faces while patrolling the campus during heatwaves. The extreme temperatures not only challenge the safety of students and officers but also significantly impact the efficiency and comfort of their operations. Despite these

challenges, she emphasized the resilience of her team, who remain committed to their duties regardless of the conditions (Danser, personal communication, 2024).

Moreover, children present on campus, whether throughout the year at the Dickinson Children's Center or during specific events, are highly susceptible to environmental stressors such as heat. Studies have shown that children are particularly vulnerable to heat due to their physiological, behavioral, and developmental characteristics, which may exacerbate health outcomes like asthma, obesity, and overall well-being when exposed to extreme temperatures (Vanos, 2014).

The psychological impacts of extreme heat are profound. Elevated temperatures are linked to increased aggression, anxiety, and stress disorders, complicating the mental health landscape, especially in settings like educational institutions where pressure and stress are already high (West et al., 2023). Mitigating these psychological effects requires a multifaceted approach including enhanced mental health services and awareness programs that educate the campus community about the signs of heat-induced psychological distress and the importance of seeking help.

In summary, extreme heat presents formidable challenges to human health, often leading to heatwaves and associated health issues. This impact extends to various campus populations, including workers, athletes, and children, highlighting the urgent need for proactive measures to address heat-related risks. By recognizing the vulnerability of these groups and implementing campus designs that mitigate environmental stressors, Dickinson College can better safeguard the well-being and health of all campus inhabitants. Moving forward, prioritizing effective mitigation strategies is crucial in confronting the escalating threats of extreme heat in the context of our changing climate.

4.2. Outdoor Air Quality

Air quality profoundly influences public health, a concern that becomes particularly acute in environments with high population densities such as college campuses. For institutions like Dickinson College, the interplay between local pollution sources—such as vehicular emissions from nearby traffic and industrial pollutants—and the broader implications of climate change significantly affects air quality (Diamond, personal communication, 2024). Climate change intensifies certain air quality issues by increasing temperatures, which can enhance the formation of ground-level ozone, and by altering weather patterns, which can increase particulate matter from both natural and anthropogenic sources. Moreover, specific site conditions at Dickinson College, such as the integrity of building infrastructure and landscaping choices, also play critical roles. For instance, older buildings may have less efficient HVAC systems that do a poor job of filtering air, or landscaping decisions could affect local airflows and natural pollutant filtering mechanisms (Daisey et al., 2003).

Additionally, the layout and density of the campus buildings can trap pollutants, creating microenvironments where poor air quality persists longer than it might in less congested settings (Daisey et al., 2003). Such factors necessitate a comprehensive approach to managing air quality that includes monitoring both outdoor and indoor environments. Indoor air quality, influenced by factors ranging from construction materials to everyday cleaning chemicals, requires careful management to prevent the accumulation of volatile organic compounds (VOCs) and other harmful pollutants (Daisey et al., 2003). Understanding these complex interactions is essential for developing effective strategies to safeguard the health of campus residents by mitigating the adverse effects of poor air quality. This approach involves not only addressing immediate pollution sources but also integrating air quality considerations into broader campus planning and maintenance operations.

Climate change exacerbates air quality issues through various mechanisms. Higher temperatures increase the rate of photochemical reactions that produce ozone at ground level, a serious air pollutant, especially during the summer months. Additionally, climate change is linked to increased frequency and intensity of wildfires, which contribute to elevated levels of particulate matter in the atmosphere. According to the Fourth National Climate Assessment, these changes lead to worsening air quality across the United States, particularly affecting urban and densely populated areas such as college campuses (West et al., 2023). The direct health impacts of poor air quality are profound and multifaceted. Exposure to pollutants like particulate matter (PM_{2.5} and PM₁₀) and ground-level ozone are particularly hazardous.

The risks associated with long-term exposure to even low levels of air pollutants are especially concerning for young adults, including college students, whose respiratory systems are still developing. Continued exposure during this critical period can lead to permanent changes in lung function and structure, potentially resulting in lifelong respiratory impairment. This highlights the necessity of maintaining good air quality in environments frequented by young adults to prevent the onset or exacerbation of chronic respiratory conditions (Schwartz, 1996). Such efforts are crucial in the college setting where students may be exposed to varying levels of pollutants based on campus activities and the surrounding environment.

Effective strategies to combat these risks include rigorous monitoring of air quality on campus, reducing sources of pollution, and implementing policies to protect especially susceptible students, such as those with pre-existing respiratory issues, from high pollution levels. These measures can help mitigate the adverse effects of air pollution on respiratory health, ensuring a safer and healthier environment for students to live and learn (Brook et al., 2010). As research continues to uncover the nuanced ways in which air pollutants affect respiratory health, it becomes increasingly vital for educational institutions to proactively address these environmental challenges.

Air pollution also significantly impacts respiratory health, particularly exacerbating conditions such as asthma, chronic bronchitis, and emphysema. Pollutants such as particulate matter and nitrogen oxides penetrate deep into the lungs, causing inflammation and damaging lung cells, which can trigger episodes of severe respiratory distress in asthmatics and worsen symptoms

for those with chronic bronchitis. For emphysema sufferers, continuous exposure to these harmful particles accelerates the destruction of lung tissue, severely impacting respiratory function over time. This is particularly concerning for young adults whose respiratory systems are still developing; ongoing exposure to even low levels of these pollutants during this critical developmental phase can result in permanent alterations in lung structure and reduced lung function, leading to lifelong complications (Schwartz, 1996). Addressing these issues effectively requires comprehensive air quality management on college campuses to mitigate exposure and safeguard student health, emphasizing the critical need for environmental vigilance and proactive health measures in academic settings (Brook et al., 2010).

Emerging research has begun to illuminate the broader impacts of air pollution, extending beyond physical health to include significant effects on neurological and cognitive functions. Exposure to high levels of air pollution has been linked with impairments in cognitive abilities, notably reducing attention spans and adversely affecting memory and executive function. Such exposure is also increasingly associated with an elevated risk of developing neurodegenerative diseases, including Alzheimer's and Parkinson's disease (Power et al. (2016)). The mechanisms behind these effects involve the inhalation of fine particulate matter that can trigger systemic inflammation and oxidative stress, processes known to contribute to neuronal damage. Studies like those conducted by Power et al. (2016) underscore the critical need for stringent air quality controls, particularly in environments like educational institutions where cognitive functions are crucial, to minimize these potentially severe health outcomes.

Certain segments of the campus population, including young children at the Dickinson Children's Center, the elderly, and those with pre-existing health conditions, are more susceptible to the effects of air pollution. These groups require specific attention and preventative measures to safeguard their health.

4.3. Indoor Air Quality

In addressing the pervasive issue of mold at Dickinson College, interviews with Kevin Walters, who oversees building maintenance, and George Stroud, Vice President of Student Life and Dean of Students, have revealed that mold is a significant concern, especially in the lower campus areas. Walters and Stroud highlighted that mold is prevalent not only in many residential halls, particularly older or unrenovated ones, but also in highly frequented buildings like the library, posing substantial health risks to students and staff (Walters & Stroud, personal communication, 2024).

Mold growth in campus buildings is exacerbated by inadequate ventilation and humidity control, which are often byproducts of older building designs and aging HVAC systems. Mold contributes to poor air quality by releasing spores that, when inhaled, can lead to respiratory problems, allergic reactions, and other health issues (Johanning, 2004). The presence of mold in places where students spend a significant amount of their time, such as dormitories and

libraries, is especially concerning as these environments should support both living and learning without compromising student health.

Addressing this issue requires a proactive approach to building maintenance that ensures proper humidity levels and effective ventilation systems throughout campus facilities. This involves not only regular inspections and maintenance but also potential renovations or upgrades to HVAC systems to better control air quality and prevent mold growth. Furthermore, educating the campus community about mold prevention and remediation measures is crucial to mitigate its spread and impact (Walters & Stroud, personal communication, 2024).

4.4. Water Quality and Waterborne Diseases

Climate change significantly impacts water quality, intensifying the risk of waterborne diseases, a critical concern for health at Dickinson College. Warmer temperatures accelerate the growth of pathogens in water bodies, leading to a higher incidence of diseases such as cholera, giardiasis, and cryptosporidiosis. Heavy rainfall and flooding, more common as the climate changes, often lead to the overflow of sewage systems into natural water bodies, further contaminating water supplies with harmful bacteria and viruses (Hayden et al., 2023). Such events can compromise the safety of local water sources, affecting not just drinking water but also recreational waters that students and staff might use.

Moreover, climate change influences the proliferation of harmful algal blooms (HABs), which produce toxins detrimental to human health. These toxins can infiltrate local water supplies and pose serious health risks when ingested, inhaled, or even when they come into contact with the skin. Given the campus's proximity to natural water bodies, Dickinson College must enhance its monitoring and management of water quality to safeguard against these emerging risks. Preventative measures could include developing robust water quality testing regimes, investing in advanced water treatment technologies, and educating the campus community about the risks associated with recreational activities in natural water bodies (Hayden et al., 2023).

4.5. Vector-Borne Diseases

The threat of vector-borne diseases might escalate at Dickinson College due to climate-driven changes in the behaviors and distribution of disease vectors such as ticks and mosquitoes. Lyme disease, predominantly spread by ticks, is of particular concern in regions around the college due to the increased vegetation and milder winters that facilitate longer periods of tick activity (Hayden et al., 2023). Climate change not only extends the seasonal activity of these vectors but also enhances their geographical spread, exposing the college community to higher risks of Lyme disease.

Other diseases transmitted by mosquitoes, such as West Nile virus and potentially emerging threats like dengue or Zika, could also become more prevalent as warmer temperatures and

increased precipitation create ideal breeding conditions for mosquitoes. These conditions necessitate proactive campus-wide strategies to manage and mitigate the risks associated with vector populations. Effective measures could include managing campus landscaping to reduce vector habitats, using environmentally friendly pest control methods, and implementing community health programs to educate students and staff about personal protective measures and the importance of early disease detection and treatment (Hayden et al., 2023).

Addressing these health impacts requires a comprehensive understanding of the links between climate change, water quality, and vector-borne diseases, coupled with strategic action plans that prioritize health and safety. These efforts will be critical in ensuring that Dickinson College remains a safe and healthy environment for its community in the face of changing global climate conditions.

5. Combining Health Strategies and Community Education

As Dickinson College navigates the challenges posed by climate change, including extreme heat and deteriorating air quality, it is imperative to integrate climate considerations into health management strategies comprehensively. This includes addressing immediate hazards and preparing for long-term impacts. Developing heat action plans is crucial to protect vulnerable populations—such as the elderly, young children, and those with chronic health conditions—from extreme temperatures (West et al., 2023).

Enhancing air quality controls is also vital to manage the increase in pollutants exacerbated by higher temperatures and altered weather patterns. This can be achieved by upgrading HVAC systems for better air filtration and ensuring that buildings and campus designs contribute to, rather than impede, good air quality. Regular monitoring of air and water quality ensures the campus environment remains safe and healthy for all inhabitants, adjusting policies as needed based on data collected (West et al., 2023).

Furthermore, proactive management of vector-borne diseases is essential as climate change influences the spread of diseases like Lyme disease and West Nile virus. Effective landscape management can reduce vector habitats, while public health campaigns can educate the campus community about prevention and early detection of these diseases. The integration of green infrastructure—such as establishing green spaces and natural barriers—plays a critical role in enhancing air quality and the overall well-being of the campus (West et al., 2023).

The importance of training and preparedness for health-related shocks, particularly for departments such as Athletics and the Wellness Center, cannot be overstated. Ensuring that they are equipped to handle the increasing challenges posed by climate change is crucial. The Athletics department, for example, must manage heat stress and recognize symptoms of heat-related illnesses effectively, vital for safeguarding athlete health and safety during training and competitions.

Similarly, the Wellness Center needs robust training in environmental health issues to provide timely and effective care and guidance to the student body during health emergencies caused by environmental conditions. Community education and policy initiatives are also pivotal in managing and improving air quality. Educating the campus community about the risks associated with poor air quality and establishing stringent policies that minimize pollution sources create a cleaner, healthier environment for all (West et al., 2023).

By fostering a well-informed community and integrating strategic health and environmental policies, Dickinson College can better navigate the complexities of climate change and ensure a supportive health environment for its members. By adopting these comprehensive strategies, Dickinson College can safeguard its community from the growing risks associated with climate change, ensuring a safe and healthy environment for learning and development. These efforts must be dynamic and responsive to the latest climate science and health research to be effective in the face of evolving global conditions.

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Interviews:

- Personal communication with Danser Dee, Dickinson College, conducted on 03/07/24.
- Personal communication with George Stroud, Dickinson College, conducted on 03/29/24.
- Personal communication with Jeanette Diamond, Dickinson College, conducted on 03/07/24.
- Personal communication with Kevin Walters, Dickinson College, conducted on 04/03/24.

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