

The Impact of Climate Change on The Environment and the Characters in Nick Fuller Googins' Novel *The Great Transition* (2023)

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ABSTRACT

This research aims to analyze the impact of climate change on both the environment and the characters. It uses ecocriticism theory to examine the effects of climate change, and psychoterratic theory to analyze the psychological effects experienced by the characters in response to the climate crisis. The data sources needed were obtained from the narrative and dialogue in the novel by Nick Fuller Googins entitled *The Great Transition* (2023), using qualitative analysis methods. The study findings indicate that climate change leads to significant environmental changes, including air pollution from forest fires, plastic waste pollution in coastal areas, the death of wildlife due to diseases and pests, species migration, and rising sea levels caused by melting ice. Furthermore, these impacts are also directly related to the character's life, as reflected through psychological responses such as ecological anxiety, which underscores the emotional toll of climate change on individuals. Therefore, climate change can be categorized as a major threat to environmental sustainability and human well-being.

Key Words: *climate change, ecocriticism, psychoterratic, climate fiction, environment*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis dampak perubahan iklim terhadap lingkungan dan karakter. Penelitian ini menggunakan teori ekokritisme untuk mengkaji dampak perubahan iklim, dan teori psikoteratik untuk menganalisis dampak psikologis yang dialami karakter sebagai respons terhadap krisis iklim. Sumber data yang dibutuhkan diperoleh dari narasi dan dialog dalam novel karya Nick Fuller Googins berjudul *The Great Transition* (2023), menggunakan metode analisis kualitatif. Temuan penelitian menunjukkan bahwa perubahan iklim menyebabkan perubahan lingkungan yang signifikan, termasuk polusi udara akibat kebakaran hutan, polusi sampah plastik di daerah pesisir, kematian satwa liar akibat penyakit dan hama, migrasi spesies, dan kenaikan permukaan laut akibat pencairan es. Lebih lanjut, dampak-dampak ini juga berhubungan langsung dengan kehidupan karakter, sebagaimana tercermin melalui respons psikologis seperti kecemasan ekologis, yang menggarisbawahi dampak emosional perubahan iklim pada individu. Oleh karena itu, perubahan iklim dapat dikategorikan sebagai ancaman utama terhadap keberlanjutan lingkungan dan kesejahteraan manusia.

Kata Kunci: *perubahan iklim, ekokritisme, psikoteratik, fiksi iklim, lingkungan*

INTRODUCTION

The phenomenon of climate change has become one of the greatest global health threats to humanity in the 21st century. Climate change is the average climate change or climate variation that occurs over a long period of time (Riedy, 2016). This is marked by the increase in the global average temperature, which has risen by just over 1°C since 1880 (Santos et al., 2022). Climate change has also worsened in the past twenty years (Yakovlev & Belyaev, 2023). These changes did not occur suddenly but rather significantly over a long period, even spanning several decades (U.S Environmental Protection Agency, 2024).

Climate change reflects a long-term trend that is not temporary and encompasses significant shifts in the global climate system. Although climate change is caused by natural factors, human activities have been identified as the main cause of this climate change. As many as 97% of scientists have stated that climate change is caused by humans (NASA, 2022). It is recorded that there are several human activities that contribute to climate change.

One concrete example of human activity that plays a role in climate change is the greenhouse effect. The effect of this activity, often known as the greenhouse effect, is a contributor to the current climate change. This is because the greenhouse effect can increase air temperatures, alter weather patterns, and raise ocean temperatures (U.S Environmental Protection Agency, 2024). Climate change does not only impact one country, but occurs on a large scale, at a high speed, and across vast geographical areas, thereby affecting humans and the environment.

Globally, climate change causes various impacts, including heatwaves, disruptions in weather systems, increased frequency of severe weather, higher risk of infectious diseases, and threats to food supply (Last et al., 1998). These changes raise concerns for both humans and animals because both are directly affected. In addition, climate change also has a negative impact on the environment and the condition of the earth.

Climate change significantly impacts the balance of ecosystems, both on land and in the oceans. In terrestrial areas, climate change causes increased variability in rainfall, droughts, extreme rainfall, and raises the risk of ecosystem fires. Meanwhile, in the sea, prolonged heatwaves and ocean acidification increase additional pressure on various

marine organisms and ecosystems. Human activities such as defaunation, overfishing, and habitat destruction further exacerbate the vulnerability of ecosystems (Malhi et al., 2020).

Previous studies have shown that climate change can threaten biodiversity essential ecosystem services. Based on the conducted study, climate change in Africa has threatened biodiversity, which is a crucial foundation for the provision of ecosystem services, such as crop and livestock production, climate regulation, and disease control systems, all of which contribute to human well-being (Sintayehu, 2018). These phenomena accelerate the disruption of the natural balance, thereby reducing the ecosystem's ability to adapt to a rapidly changing environment. Climate change causes environmental damage that directly affects availability and triggers a decline in natural resources. The damage to ecosystems caused by climate change and human activities not only affects nature and animals but also triggers consequences for human life.

Climate change not only affects the environment but also human life. In the social context, climate change disrupts social systems, affects housing and food security, drives migration, and causes economic losses, hunger, and public health problems. It can also damage cultural heritage and shape the identity of individuals and communities (Alves & Schmidt, 2022). Social inequality also contributes to worsening the situation when climate change occurs. The impact of climate change tends to be uneven; the most vulnerable groups in society often experience the most severe consequences (Islam & Kieu, 2021).

Although it is not immediately apparent, climate change also threatens human existence. One of the concerning aspects of climate change is its impact on human health (Alves & Schmidt, 2022). This condition is closely related to the rise in Earth's temperature, which exacerbates global health risks. The increase in earth's temperature due to climate change has the potential to trigger various health problems.

The rise in temperature can result in increasingly intense heat exposure, reaching extreme levels. Extreme heat exposure can trigger various dangerous diseases, such as heat exhaustion and heat stroke, and can lead to death from heart attacks, strokes, and other cardiovascular disorders (U.S Environmental Protection Agency, 2024). Climate change is expected to cause approximately 250,000 additional deaths each year between

2030 and 2050 due to malnutrition, malaria, diarrhea, and heat exposure (World Health Organization, n.d.). The impact shows how serious the threat of climate change is to global health.

Climate change significantly affects mental health in addition to its physical health-related effects. The phenomenon of mental health problems caused by climate change is termed psychoterratic syndrome, characterized by sustained emotional distress caused by ecological changes (Koder et al., 2023). Individuals with this illness frequently experience negative feelings, including anxiety, worries, and frustration, in reaction to environmental risks (Er et al., 2024). The effects of climate change are universal, affecting all regions and demographics. One example of this influence is heatwaves, which have now emerged as a significant concern in numerous countries, including the United States.

Heatwaves occurring in the United States have increased in fifty major cities, such as Chicago, Dallas, Miami, Boston, Phoenix, Memphis, and Seattle. The frequency of heatwaves now reaches six occurrences per year during the years 2010 and 2020, compared to only two occurrences during the 1960s. Additionally, the heatwave season now lasts 46 days longer than in the 1960s. Heatwaves can pose a significant threat to humans, Overall, more than 14,000 Americans have died from heat-related causes since 1979 (U.S Environmental Protection Agency, 2024).

Besides the Central and Southern regions, northeastern states like Maine are also experiencing the tangible impacts of climate change. Climate change in Maine has recorded that the 4 hottest years in history occurred from 2020 to 2023. These changes include increasingly longer warm seasons, while winters are becoming shorter. Additionally, there has been an increasing frequency of stronger extratropical storms, such as the southeastern storm in December 2023 and January 2024, as well as the major wind storms in 2017 and 2019 (Scientific and Technical Subcommittee of the Maine Climate Council, 2024). The unpredictable climate, rising temperatures, and drastically changing rainfall patterns have disrupted the balance of the ecosystem. Challenging situations also arise in crucial aspects, such as water availability.

Some countries are now experiencing worsening water crises due to climate change, one of which is Iran. Since the drought in 1999, rainfall in the region of Iran has

continued to decline. On the other hand, environmental pollution and water consumption are increasing, along with the growing population of Iran, especially in urban areas and the capital city of Tehran (Zargan & Waez-Mousavi, 2016). This phenomenon is also further worsening the economic and social conditions of the country. Due to experiencing severe water pressure, this affects the economic conditions, agriculture, society, and food security of Iran (Vitkovic & Soleimani, 2019). In addition to its ecological impact, climate change also threatens the stability and well-being of a country's society. This condition has become a focus in the fields of science and public policy, but it has also inspired various expressions in the cultural realm, including literary works.

Literature is a term used for written works that are imaginative or creative in nature, including all works of fiction, poetry, drama, and nonfiction (Alfarhan, 2024). Apart from merely being a form of artistic expression, literature plays a profound role in human life. Literature has been recognized as a powerful medium for shaping human consciousness, influencing perspectives on society, culture, and the environment. One prominent field of literary study is ecocriticism. This field explores the relationship between literature and the environment, providing a framework for analyzing how literary works shape views on nature, ecological responsibility, and sustainability issues (Radhakrishnan, 2025).

Literature is also capable of conveying climate challenges, deepening understanding and empathy, and encouraging the creation of social actions (Khandelwal & Dhand, 2024). Narrative analysis of climate change in literary works shows the important role of literature in shaping public awareness. Surveys show an increasing understanding among readers of the interconnection between social and ecological issues. Literature has also become an effective means to promote environmental justice and an inclusive approach in addressing the climate crisis (Rani & Snehi, 2023).

The role of literature in shaping public understanding of environmental issues is increasingly evident through various genres, one of which is fiction that specifically addresses the climate crisis. The literary analysis of climate change, known as cli-fi (climate fiction), aims to raise awareness and encourage readers to face the realities of the Anthropocene, a term that describes the current geological era in which human

activity is a main factor affecting the environment (Gupta, 2024). Climate fiction has a significant eco-political impact because it opens readers' "imagination to future climate disasters and the urgency of interventions needed" in the present. It also has the potential to influence individuals, views, and actions towards the environment (Patil & Lahane, 2024).

The Great Transition (2023) by Nick Fuller Googins portrays the profound impacts of climate change on both the environment and the characters. This novel is set in the future, where climate change has drastically altered the world and focuses on the human response to environmental disasters and the possibility of social change. One of the affected regions is the United States, which is depicted as experiencing storms more extreme than before. The story follows the journey of Larch, Kristina and their daughter, Emi. This speculative backdrop not only reflects climate change and political dynamics but also highlights the need for changes in human behavior towards the environment for the survival of humanity. Building on previous ecocritical studies that have explored various literary portrayals of the climate crisis, this research offers a focused analysis of how climate change influences both environmental conditions and individual experiences in the novel.

This research uses qualitative methods to analyze the data more deeply and comprehensively. Qualitative research emphasizes words rather than numerical measurements in the processes of data collection and analysis (Bryman, 2008). In literary studies, this approach is particularly useful since the data are in the form of language, narratives, and textual representations rather than numbers. In the context of this research, the data consist of descriptive details from the novel *The Great Transition*, which offer insights into how characters, settings, and events reflect ecological issues.

To obtain the required data, there are several steps needed to collect it. The first step is to re-read the entire story that will be discussed in order to better understand what will be discussed. Reading carefully helps to notice facts and particulars about the text. The second step is to interpret the effect of climate change on the environment and the characters. The researcher interprets and understands the theories through additional media, such as journals or books. Then, the next step is to understand the effect of climate change on the environment and the characters as depicted in the story. At this

point, after getting the analysis, the researcher relates it to the issue or topic raised and begins to reinterpret it in more detail and develop it. Once this is done, the researcher can write the conclusions on which the research is based.

DISCUSSION

In *The Great Transition*, climate change is portrayed through vivid descriptions of altered landscapes, disrupted seasons, and unpredictable weather patterns that directly affect both the environment and the characters' lives. Rising sea levels threaten coastal settlements, while prolonged droughts strain local resources and force difficult decisions about relocation. These environmental changes alter social dynamics, disrupt livelihoods, and challenge the characters' sense of stability. Through Larch's struggle to adapt and Kristina's reflections on loss, the novel illustrates how climate change reshapes human experience on both a physical and psychological level.

The Impacts of Climate Change on the Environment and the Characters

Pollution

Pollution is described as the entry of harmful substances into nature that disrupts the ecological balance. This is symbolically depicted to illustrate the violation between pure and polluted. Air pollution is one of the types of pollution that occurs in the novel *The Great Transition*. It is portrayed in *The Great Transition* as a result of widespread wildfires, which reflects the environmental crisis caused by climate change. The fire that occurred is described when the main character or Larch was eight years old, and the fire burned Acadia from end to end. At the time, Larch was living with his family in Maine, where his home was located. This event is depicted in the following quote from the novel: *The early morning sky was veiled in haze from faraway fires that had been raging all summer. This was the heart of the Crisis but hardly anybody called it that. When I was eight Acadia burned shore to shore. (Googins, 2023:45)*

Acadia is a national park located in the state of Maine, United States, including forests, mountains, and rocky coastlines. In the novel, this area is depicted as being severely affected by wildfires as a part of the environmental collapse. The description of a sky veiled in haze and the burning of Acadia illustrates how smoke from prolonged fires led to severe air pollution. Although the cause of the fire is not explicitly stated, the

novel is set during a time of environmental collapse known as the crisis, implying that the fire was likely linked to climate change. Wildfires like those in Maine are commonly intensified by human-induced global warming, particularly through prolonged drought and heatwaves (Cover, 2025).

The novel also illustrates how environmental crises directly impact human life during the Crisis period. Social unrest, ecological disasters, and public suffering occur simultaneously. The forest fire is reported to have extended to other locations, including New Jersey. The Pine Barrens experienced a forest fire, resulting in smoke distribution to New York through the wind. This occurrence certainly presents a risk of air pollution similar to the one that occurred in Maine. This image is mirrored in the following passage: *And closer to home: the Pine Barrens went up in New Jersey—eighty-five miles south and smoke clouding New York’s sun in that way I remembered all too well.* (Googins, 2023: 154)

This passage reflects how climate related disasters, such as wildfires, not only damage the environment but also disrupt daily life and worsen air quality across regions. By showing the spread of smoke to New York, the novel illustrates the far-reaching impact of such events, similar to real-life wildfire scenarios. The novel’s depiction aligns with the real conditions of the Pine Barrens, a forested region in New Jersey known for its wildfire vulnerability.

The pine barrens mainly consist of forests. The New Jersey Pinelands depend on wildfires for ecological renewal and natural fuel management. These fires are intensely hot and propagate rapidly due to the combination of natural fuels, urban development, and severe weather conditions, resulting in significant wildfires (New Jersey Office of Emergency Management, 2019). Climate change contributes to wildfires; rising temperatures create conditions such as low humidity, strong winds, and dry lightning that ignite flames. Climate change and wildfires are linked phenomena, with climate change increasing the risk of wildfires and wildfires contributing to climate change (Boegelsack et al., 2018). Wildfires are essential for regeneration and fuel management; however, climate change and human activities increase their incidence.

Wilderness

Nature is perceived as a secure habitat for animals and plants to live and flourish. The novel highlights the long-term effects of invasive species on forest ecosystems, showing how even resilient trees can be overwhelmed. However, this can be affected by the climate change depicted in the narrative: *When I was fifteen the hemlocks disappeared. They had been fighting the invasive woolly adelgid as long as I had been alive. You could spend a whole morning crushing the tiny insects between your thumb and index finger and not clear one branch of one tree. I had to walk deep into the woods to find a healthy hemlock. (Googins, 2023:45)*

Larch reflects on the disappearance of hemlock trees by the time he was fifteen. The forest has been heavily affected by an invasive pest, the woolly adelgid, which devastated the local hemlock population despite persistent efforts to control it. He describes the struggle to find even a single healthy tree, emphasizing the impact of this environmental challenge. This pest's relentless spread has had devastating effects on hemlock forests across many regions. The hemlock woolly adelgid is an insect native to Japan, China, and the Pacific Northwest of the United States (McCarty & Adesso, 2019).

The effects of the hemlock woolly adelgid (HWA) are expanded beyond tree mortality; they also disrupt the ecosystem, result in habitat loss, and endanger numerous species of flora and fauna dependent on hemlock forests (Havill et al., 2014). The hemlock woolly adelgid pest is closely linked to climate change, causing its migration in search of new habitats. Climate change, especially rising temperatures, is causing this pest to migrate northward, creating a new problem as nearly the entire range of eastern hemlock tree becomes vulnerable to invasion (Cornelsen et al., 2024). It may be inferred that HWA poses a significant threat to trees life, with its growth intimately linked to climate change due to its dependence on specific temperature range.

The representation of the wilderness extends beyond the HWA pest affecting hemlock trees. The setting shifts to flood-ravaged New York, where Larch, volunteering during the climate crisis, reflects on the city's condition and the changes it has undergone. The impact of climate change on nature is also illustrated in the subsequent section: *The signs of terminal decline were obvious even to those of us who had grown up in the Maine woods and considered Bangor serious urban living. Entrances to the*

subway had been sealed off from Mooring. Trees dead from roots gorged on salt water. Beachfront neighborhoods where teachers and firefighters had lived were now reefs of rust and timber. (Googins, 2023:95)

This scene is described from Larch's point of view during his time volunteering in flood-stricken New York. As he navigates the city, he observes firsthand the devastation caused by climate change: flooded infrastructure, dead trees from saltwater intrusion, and abandoned neighbourhoods overtaken by decay. His reflections reveal both the scale of the destruction and the emotional weight of witnessing a once-great city in terminal decline.

The phrase "*Trees dead from roots gorged on salt water*" refers to the phenomenon known as a ghost forest. This condition occurs when elevated sea levels flood coastal terrain or when saltwater accumulates due to the increasing sea level. Seawater combined with freshwater will create freshwater pools with increased salinity. The increased salt concentration is challenging for the majority of trees to survive, resulting in widespread tree mortality and a landscape filled with dead trees (Metych, 2025). This indicates that waterlogging leads to tree mortality and that the quality of water in the areas significantly affects vegetation survival. Instead of portraying wilderness as pristine or untouched, the ghost forest illustrates a damaged and dying landscape shaped by climate change, challenging the romantic ideal of wilderness as a place of purity and beauty. These damaged areas no longer support the diverse plant and animal life they once did, signalling a profound shift in ecological balance and resilience.

The novel's portrayal of drowned neighbourhoods and dying trees exemplifies the destructive effects of rising sea levels and saltwater intrusion. This is reflected in the novel's depiction of New York, where "*Beachfront neighborhoods where teachers and firefighters had lived were now reefs of rust and timber*", illustrating how formerly liveable areas have been overtaken by environmental collapse. The coastal area is the most vulnerable to the threat of rising sea levels, with consequences including flooding, coastal erosion, population displacement, and ecological degradation. Storms and floods that have struck many coastal cities have caused changes to coastal settlements, making them less habitable (McDermott, 2023). These changes will substantially affect coastal

ecosystems and economy, potentially instigating dramatic reorganisations in this century (Kirwan & Gedan, 2019). The novel highlights how rising sea levels can turn once-inhabitable coastal areas into zones of irreversible environmental collapse.

Apocalypse

Apocalypse is one part of ecocriticism that depicts great destruction due to ecological crises. Larch remembers his childhood moments with his mother in their garden, noticing early signs of environmental change. The depiction of the apocalypse occurs in the novel, as in this part: *The blackberries my mother grew on a trellis by the drying huts turned sour (Googins, 2023:45). My mother pointed out how the goldenthread blossomed months before the pollinators arrived. (Googins, 2023:46).*

When he was eight, the blackberries his mother tended started to turn sour. Years later, at fifteen, he observed how the goldenthread bloomed too early, before the pollinators showed up, signalling ongoing shifts in nature's timing caused by climate change. Larch's observation of shifting plant behaviors highlights how the natural world is adapting and struggling in response to climate change. These small, personal experiences reflect the apocalypse narrative Garrard outlines, where environmental decline is not always sudden or catastrophic, but unfolds gradually through everyday disruptions. Such narratives highlight a sense of loss and instability, warning readers of a future shaped by ongoing ecological collapse.

The change in the flavor of berries as described in the novel, is certainly not unrelated to the effects of climate change. Climate is the main factor affecting the quality of grape berries, particularly the anthocyanin content and acidity (Barnuud et al., 2014). Changes in temperature, rainfall, and environmental pressures worsen the quality of harvests, increase vulnerability to pests and diseases, and create new challenges such as unmet chilling requirements and increased irrigation needs. The impact also extends to geographical distribution, pollinator populations, and hinders the development of adaptive varieties, thereby reducing the resilience of fruit production systems to climate change (Bhattacharjee et al., 2022). The ongoing global warming not only affects the quality of the produced fruit but also includes changes in the habitat for berries. In addition to causing changes to the habitats of berry plants, research in Belgium revealed that rising temperatures accelerate the aging process of flowers and reduce seed

production, due to the accelerated development of flowers or increased fungal infections, as well as limited pollinator activity (Mohan et al., 2019).

Climate change not only impacts the growth of berry plants but also causes significant changes in how people live. Lobster farms are significantly impacted by climate change. This was already evident when Larch was fifteen, as he witnessed his coastal community suffer economic collapse due to declining lobster populations. These changes include the loss of livelihoods and result in several additional consequences, as detailed in the following part: *The Crisis was economic ruin for our neighbors who knew nothing but lobstering. Lots turned to drugs. Some to suicide. (Googins, 2023:47)*

Larch reflects on how environmental changes devastated the local lobster industry, an essential livelihood for his community. As economic ruin hit, some of his neighbours turned to drugs, while others took their own lives. This setting aligns with Garrard's concept of apocalypse, which frames ecological collapse as not only an environmental disaster but also a catalyst for societal breakdown and emotional despair. The passage captures how the early stages of the climate crisis brought about a slow but devastating unravelling of both nature and human lives, emphasizing that the apocalypse, as Garrard suggests, can be experienced gradually, in deeply personal and communal losses.

Larch lives in a coastal town in Maine, where many of his neighbours work as lobster fishermen. These fishermen face growing challenges due to the biological unpredictability of lobsters caused by rising sea temperatures and changes in local ecosystems. This unpredictability directly affects their income, as market prices fluctuate depending on lobster quality (Mason et al., 2024). Additionally, commercial fishermen are at high risk of drug use, particularly opioids, due to a combination of factors such as physically demanding labour, chronic pain, family separation, long working hours, and financial stress (Walter et al., 2018). These social pressures are closely linked to broader environmental challenges faced by fishing communities.

Dwelling

Dwelling refers to the relationship between humans and their living spaces, including how living spaces and residential environments are formed, influenced, and experienced. At the age of fifteen, Larch lived in a coastal town where climate impacts

were becoming visible, prompting community-led efforts to support incoming migrants. The representation of this can be seen in the following section: *Constructing tent platforms for the migrants coming north from the Gulf. (Googins, 2023:46)*

This scene is set when Larch, at fifteen, helps build tent platforms for migrants traveling north from the Gulf. It reflects the growing human impact of climate change, showing communities responding to displacement caused by environmental crises. This moment illustrates Garrard's concept of apocalypse as a gradual and lived experience, where environmental collapse leads to human displacement and the breakdown of communities over time.

Climate change is expected to force tens of millions of Americans to relocate, as the rising frequency of floods, storms, and wildfires pushes many families to move from vulnerable areas to nearby urban centers, such as from Savannah to Atlanta or Houston to Austin. In addition, the gradual impacts, such as rising sea levels, extreme heat, and drought, are making some areas uninhabitable, prompting migration to northern cities, particularly in the Great Lakes and New England regions (Robustelli et al., 2024).

The loss of housing due to various changes has become a serious global issue, leading to the establishment of many emergency camps for displaced individuals in new locations. Losing homes causes people to lose the complete meaning of their residences. Besides the migrants coming from the Gulf, there are several others coming from other places, like Texas, Alabama, and Florida. The following excerpt from the novel supports this statement: *The news felt especially real because I saw it daily. License plates from Texas and Alabama. So many from Florida. Makeshift camps in highway rest stops and beachside parking lots. (Googins, 2023:71)*

This scene occurs as Larch evacuates alone after losing his parents. On the road, he witnesses the growing climate migration firsthand license plates from Texas, Alabama, and Florida, and makeshift camps in rest stops and beachside lots making the crisis feel immediate and undeniable. This moment reflects Garrard's concept of dwelling, where the experience of place is shaped by movement, memory, and adaptation. As Larch observes displaced families turning transient spaces into temporary homes, it highlights how people attempt to create a sense of belonging and

survival even amid upheaval, redefining what it means to dwell in a world reshaped by climate collapse.

Roadside emergency camps, serving as temporary housing for migrants, have become a shared concern. Migration due to climate change has become an increasingly visible and complex phenomenon, especially the movement of people from rural to urban areas within a country (Serraglio et al., 2019). Climate change and extreme weather worsen homelessness conditions through forced migration, poverty, and social pressure (Bezgrebelna et al., 2021).

Animals

Consequently, ecocritical critique seeks to change this viewpoint by recognizing animals not merely as metaphors, but as real subjects deserving of ethical consideration. The scene is set in a dense forest dominated by hemlock trees, where Larch has spent much of his life. Over the years, the forest has been under threat from the invasive woolly adelgid insect, which has slowly decimated the hemlocks. The representation of animals is clearly illustrated in these sections of the novel: *When I was fifteen the hemlocks disappeared. They had been fighting the invasive woolly adelgid as long as I had been alive. You could spend a whole morning crushing the tiny insects between your thumb and index finger and not clear one branch of one tree. I had to walk deep into the woods to find a healthy hemlock. (Googins, 2023:45)*

By the time Larch is fifteen, the healthy hemlocks have become so rare that he must venture deep into the woods to find any that remain untouched. The forest carries a sense of quiet loss and fading natural beauty, marked by the persistent battle between native trees and invasive species. The declining hemlocks reflect Garrard's idea that animals and plants are interconnected parts of an ecosystem. This insect is depicted as a pest to be exterminated, illustrating how animals are characterized as threats from the human viewpoint, disregarding their role as vital parts of the forest ecosystem.

The arrival of this insect coincides with forest use and climate change, which are facilitating the spread of white-tailed deer into northern areas, consequently increasing parasite pressure on large deer populations. Winter is the primary factor contributing to significant deer mortality in New England, where certain deer harbor over 50,000 ticks on their bodies. Moose, particularly their calves, are extremely susceptible as they lack

the ability to manage these pests (Debow et al., 2021). The incidence of tick illnesses indicates that female moose and calves exhibit a higher vulnerability to parasites. The presence of nematode larvae in the lungs indicates an extended effect on the growth and health of young deer (Davidson et al., 2015). Climate change resulting from global warming profoundly affects the existence of this parasite.

Another species impacted by climate change is the dolphin. While volunteering, Larch hears a news broadcast announcing the extinction of another dolphin species. The following passage from the novel illustrates this representation: *Another dolphin species declared extinct. (Googins, 2023:154)*

The announcement highlights the emotional weight of the Crisis, striking Larch on a deeply personal level. As a volunteer trying to make a difference, he feels the loss sharply. The extinction of the dolphin species is reduced to a brief headline, stripped of its deeper meaning. It hides the reality that these animals had lives, worth, and a rightful place in the world, now lost forever.

The Atlantic white-sided dolphin is facing disruptions in its food chain and habitat at higher latitudes as a result of climate change (Calderan, 2021). Extinction is also happening in the Gulf of Maine, a region crucial for the protection of tiny cetaceans, particularly harbor porpoises, where approximately 40,000 white-sided dolphins and harbor porpoises inhabit year-round. This species, due to its endangered status, possesses the highest legal protection in the US and is a primary focus of conservation initiatives (Thompson, 2010). This is a considerable difficulty for marine ecosystems, as several species have been stated extinct; extinction occurs not only in marine environments but also impacts river ecosystems.

Earth

Earth is portrayed as a metaphor representing the deep connection between human interaction and nature. Larch is in the kitchen of the Great Northern Greens Arena, working with his friends Lucas and Osman, washing dishes after breakfast. It's an ordinary morning that turns surreal when sudden shouts echo from the arena, followed by an eerie silence. This statement is supported by the following passage from the novel: *They had it on the jumbotron. The West Antarctic Ice Sheet. Drones streamcasting live.*

So much ice. Ice the size of Pennsylvania, they told us. Glaciers ten thousand feet thick. An avalanche that continually slid into the ocean for days on days. (Googins, 2023:78)

As they rush out, they see a live broadcast on the jumbotron: the collapse of the West Antarctic Ice Sheet. The massive scale of the disaster, glaciers the size of Pennsylvania sliding into the ocean is captured in real time by drones, marking a turning point in the climate crisis. This moment reflects Garrard's Earth concept, where the planet is no longer seen as stable and eternal, but fragile and in crisis.

The melting ice in Antarctica indicates a disruption in the Earth's systems that significantly impacts living organisms. If greenhouse gas emissions continue in their rise, the Antarctic ice layer that inhibits glacial flow to the ocean could weaken and collapse before 2150, resulting in an increased melting and discharge of glaciers into the sea. This will accelerate ice melting and significantly increase sea levels (Jourdain et al., 2025). The collapse of ice shelves in Antarctica may precipitate significant ice mass loss, particularly within the West Antarctic Ice Sheet, potentially resulting in a global sea level increase of 1.91 to 5.08 meters (Sun et al., 2020). The melting of Antarctic ice shows how one change can impact the entire planet.

The melting of ice at the poles causes great concern because it will lead to rising sea levels. The continuously rising sea levels will cause flooding and other difficulties for coastal communities. While volunteering in New York, Larch notices that sea level rise is worse there than in the southern regions affected by the ice collapse. The following quote illustrates this depiction: *Something to do with gravity and New York's latitude meant that sea level rise was worse here than down south where the ice was collapsing. A difference of three or four feet. (Googins, 2023:96)*

Despite the ice collapse occurring far away in Antarctica, gravity and New York's specific latitude cause sea levels here to rise more dramatically than in southern regions affected by the same ice loss. The difference amounts to three or four feet, a significant increase that threatens coastal communities and ecosystems. This difference, caused by gravity and latitude, highlights how Earth's systems are interconnected yet complex. It reflects Garrard's concept of Earth as a dynamic, integrated entity where changes in one part affect others unevenly. This scene highlights the complex and uneven ways Earth's

physical forces interact with climate change, making some places more vulnerable than others even when they are far from the source of disruption.

A sea level rise of three or four feet higher than in the south increasingly clarifies the climate change currently occurring. Climate change causes global sea level rise, which is expected to accelerate in the 21st century (Affandi et al., 2022). The melting of ice in Greenland and Antarctica has caused global sea level rise throughout this century. The contribution of Greenland's ice to sea level rise is relatively stable under medium and high emissions, whereas the melting of Antarctic ice shows a threefold increase under high emissions (Zhang, 2020). Climate change causes sea level rise to occur worldwide due to the melting of glaciers in polar regions.

The Psychological Impacts of Climate Change on the Characters

Ecoanxiety

The mental health issues which are related to climate change include depression and anxiety, both of those issues occur due to the environmental changes that happen. This condition is known as eco-anxiety, it is a feeling which arises as an indirect consequence of climate change, which causes damage to the individual's environment. It is associated with depressive symptoms, such as anxiety, stress, insomnia, as well as cognitive emotional and functional disturbances (Boluda-Verdú et al., 2022). Therefore, this condition creates a prolonged sense of worry that envelops the affected communities.

Kristina, a mother struggling with the impacts of climate change, is talking to her child, Emi. In this conversation, it is clear that she feels fear and anxiety because she believes her efforts to protect the environment have been insufficient. This section highlights Kristina's worry despite her attempts to confront the situation. Her expressed anxiety reflects a concrete example of eco-anxiety experienced by affected populations, as portrayed in the novel: *She lowers her voice and switches to Spanish: Everything I do, I do for you. For your future. You know that. We fought so hard for this. But it's not over.* (Googins, 2023:24)

In this part, Kristina's fear is clearly visible when she is talking to her child, Emi. Kristina feels scared and anxious because she feels her environmental rescue efforts have been insufficient. A long-term consequence of climate change is a disruption in

people's emotional connections to their living environment. Changes in the landscape, long droughts, and higher sea levels often have long-term effects that include emotional stress, a loss of connection, and anxiety (Tang, 2021). Fear and anxiety are categorized as ecological anxiety in psychology. Ecological anxiety is a complex emotional condition, involving various emotions such as fear, worry, anger, despair, guilt, and sadness (Pihkala, 2020). Kristina experiences worry and concern for Emi potentially undergoing the same emotions she experienced before to the transition and she wishes to prevent that occurrence.

The merging of anxiety and optimism leads to a resistance to the world's impending destruction for future generations. As the environmental danger continues, the fight must continue as well. The previous generation, particularly Kristina, feels a sense of responsibility about the planet they will leave. Individuals with high levels of ecological anxiety are more likely to engage in pro-environmental activity, particularly when they have a consistent pattern of paying attention to climate change information (Mathers-Jones & Todd, 2023). Eco-anxiety demonstrates that anxiety born from a sense of responsibility and awareness does not ensure a secure future amidst the crisis.

Eco-anxiety also leads some individuals to be more concerned about the degraded environment and to participate in restoration actions. This action is illustrated by the following narrative: *We hear about people from deconstructed towns who lost everything to the Crisis and say it was just one big adventure. As if forgiveness is some godly virtue. Forgiveness is not a virtue. It's cowardice. A way to avoid the unpleasantness of justice. People should be outraged.* (Googins, 2023:158)

The word "We" refers to Kristina and others who have endured hardship, loss, and displacement caused by the climate crisis. Kristina expresses her refusal to extend her forgiveness to any individuals responsible for climate change. It is explained when she argues that pain is a wonderful journey and dismisses the idea of forgiveness. Kristina's perspective states that the suffering caused by the climate problem cannot be pardoned or considered attractive. This posture demonstrates Kristina's moral resistance to the narrative of mitigating the problem, while simultaneously demonstrating how anger and rejection may be expressions of deep ecological awareness.

On the other hand, she emphasizes the significance of fighting for environmental justice and repairing the damages. Ecoanxiety is a reaction that arises from the increasing awareness and concern over the worsening climate crisis. More than just an individual issue, eco-anxiety reflects the environmental crisis, cultural identity, and ecological justice (Arcanjo, 2019). This indicates that eco-anxiety is not only a problem for the mental health of affected communities, but also drives them to make some improvements and engage in environmental struggles.

Solastalgia

Solastalgia is a psychological condition experienced by communities or individuals impacted by environmental changes, it could happen due to environmental changes in the environment surrounding an individual's home, despite the individual not having physically moved to other places. This condition arises when the place called "home" experiences damage or loses its significance, failing to offer a sense of comfort or tranquillity (Albrecht et al., 2007). The novel depicts Larch's experience of solastalgia resulting from migrating; he becomes orphaned and seeks refuge for his safety. However, this affects Larch's mental health as he misses his home. It is apparent in the following dialogue: *Like much of Maine Company I missed the wind in trees. I missed trees. (Googins, 2023:122)*

The dialogue above shows that Larch misses the trees and the wind blowing through the leaves, but that no longer exists because of climate change. This feeling indicates that Larch has solastalgia for his original place. As previously mentioned, solastalgia is an emotional state characterized by nostalgia, anxiety, stress, and concern arising from damage to one's environment. This condition signifies loss of comfort and safety from an environment that previously offered psychological support (Cáceres et al., 2022). This signifies that Larch experiences solastalgia, illustrating how environmental changes undermine comfort, place identity, and inner peace.

In another part of the novel, it is also explained that Larch misses the ocean as a place he considers as his second home, as stated: *I missed the ocean. My home. My head felt so foggy. I ate. I slept. I grew. (Googins, 2023:74)*

From the narration above, it can be inferred that Larch sees sea as a sign of home and peace; therefore, he has strong interest towards the ocean. Solastalgia is a feeling of

sadness and loss resulting from environmental degradation, as experienced for example in the coastal community in Courtown/Riverchapel, Ireland. This emotion is closely related to place attachment, which is the emotional connection to a location, and it negatively impacts perceptions of both personal and future generations' prospects (C. Phillips & Murphy, 2021) . Larch shows a feeling of pessimism towards the once-familiar nature. This scenario illustrates how the disconnection from the water as a home creates an emotional and identity problem.

CONCLUSION

From the discussion in the previous chapter, it is revealed that climate change significantly impacts the environment and human existence. In Nick Fuller Goggin's novel titled *The Great Transition (2023)*, the impact of climate change is depicted through six aspects of ecocriticism: pollution, wilderness, apocalypse, dwelling, animals, and earth. In pollution, environmental degradation and air contamination. The wilderness section shows how invasive species like the hemlock woolly adelgid, ghost forests, and declining marine productivity damage ecosystems and threaten biodiversity. In the apocalypse, climate change causes forced migration, economic collapse, and mental distress across regions like the United States. The dwelling section highlights the destruction of homes in marginalized communities. In animals, the novel portrays habitat loss, disrupted food chains, disease, and extinction, calling for ethical recognition of animal suffering. Finally, the earth section emphasizes the disruption of planetary systems through Antarctic ice melt and sea level rise which together threaten both ecological balance and human health.

Beyond environmental degradation, the novel also explores the psychological impacts of climate change through Albrecht's psychoterratic framework. These impacts are embodied in the characters, as eco-anxiety leads to a range of emotional and psychological responses such as fear, anger, despair, frustration, and moral tension that not only affect individual mental health but also motivate environmental action, resistance, and the pursuit of safer, more sustainable living conditions. Larch, in particular, experiences solastalgia, loss of identity, emotional distress, and a diminished

sense of safety due to the destruction of his environment, separation from his family, and the collapse of his sense of home.

The Great Transition demonstrates how climate change is a multidimensional crisis that influences ecosystems, species survival, and human psychological conditions. It reveals that emotional responses such as ecoanxiety and solastalgia are valid manifestations of living in a world marked by ecological instability. This study concludes that climate change must be recognized not only as an environmental and political issue but also as a profound psychological challenge. Literature like *The Great Transition* offers critical insight into this connection, showing how stories can help us understand and humanize the lived experiences of climate trauma.

Therefore, through the analysis conducted on this novel, the researcher found that the vast majority of humans still remain indifferent to environmental damage until its consequences become personal and unavoidable. This apathy emphasizes the necessity of real behavioral and systemic changes to prevent future harm. In this context, Climate Fiction (Cli-Fi) emerges as a vital literary genre that frames climate change as an urgent human issue. Through compelling stories such as *The Great Transition*, the novel encourages readers to cultivate empathy, responsibility, and care by portraying characters who suffer from environmental collapse, experience eco-anxiety, and take action both personal and collective against climate injustice. By humanizing the climate crisis through lived experiences, family struggles, and moral dilemmas, the novel helps readers emotionally connect with the issue.

In conclusion, climate change affects both the environment and individuals' mental well-being. Literature, especially climate fiction, plays a significant role in raising awareness, fostering empathy, and prompting reflection, making it a powerful tool in the fight for a more sustainable future.

REFERENCES

- Affandi, M. L. A., Din, A. H. M., & Rasib, A. W. (2022). A Short Review on Causes of Sea Level Rise for Climate Monitoring. *IOP Conference Series: Earth and Environmental Science*, 1051(1), 012003. <https://doi.org/10.1088/1755-1315/1051/1/012003>

- Albrecht, G. (2011). Chronic Environmental Change: Emerging 'Psychoterratic' Syndromes. In I. Weissbecker (Ed.), *Climate Change and Human Well-Being* (pp. 43–56). Springer. https://doi.org/10.1007/978-1-4419-9742-5_3
- Alfarhan, E. A. (2024). The Influence of Literature on the Society. *International Journal of Social Science and Humanities Research*, 12(1), 263–270. <https://doi.org/10.5281/ZENODO.10886693>
- Alves, F., & Schmidt, L. (2022). Editorial: Climate Change and Society. *Frontiers in Sociology*, 7, 01–04. <https://doi.org/10.3389/fsoc.2022.991193>
- Arcanjo, M. (2019). *Eco-Anxiety: Mental Health Impacts of Environmental Disasters and Climate Change* (p. 9). Climate Institute. <https://files.wmich.edu/s3fs-public/attachments/u304/2021/Eco-Anxiety-Mental-Health-Impacts-of-Environmental-Disasters-and-Climate-Change.pdf>
- Barnuud, N. N., Zerihun, A., Gibberd, M., & Bates, B. (2014). Berry Composition and Climate: Responses and Empirical Models. *International Journal of Biometeorology*, 58(6), 1207–1223. <https://doi.org/10.1007/s00484-013-0715-2>
- Bezgrebelna, M., McKenzie, K., Wells, S., Ravindran, A., Kral, M., Christensen, J., Stergiopoulos, V., Gaetz, S., & Kidd, S. A. (2021). Climate Change, Weather, Housing Precarity, and Homelessness: A Systematic Review of Reviews. *International Journal of Environmental Research and Public Health*
- Bhattacharjee, P., Warang, O., Das, S., & Das, S. (2022). Impact of Climate Change on Fruit Crops- A Review. *Current World Environment*, 17(2), 319–330. <https://doi.org/10.12944/CWE.17.2.4>
- Boegelsack, N., Withey, J., O'Sullivan, G., & McMartin, D. (2018). A Critical Examination of the Relationship between Wildfires and Climate Change with Consideration of the Human Impact. *Journal of Environmental Protection*, 9(5), Article 5. <https://doi.org/10.4236/jep.2018.95028>
- Boluda-Verdú, I., Senent-Valero, M., Casas-Escolano, M., Matijasevich, A., & Pastor-Valero, M. (2022). Fear for the Future: Eco-anxiety and Health Implications, a Systematic Review. *Journal of Environmental Psychology*, 84, 101904. <https://doi.org/10.1016/j.jenvp.2022.101904>
- Bryman, A. (2008). The End of the Paradigm Wars? In P. Alasuutari, L. Bickman, & J. Brannen (Eds.), *The Sage Handbook of Social Research Methods* (pp. 12–25). Sage Publications Ltd. <https://doi.org/10.4135/9781446212165.n2>
- Cáceres, C., Leiva-Bianchi, M., Serrano, C., Ormazábal, Y., Mena, C., & Cantillana, J. C. (2022). What Is Solastalgia and How Is It Measured? SOS, a Validated Scale in Population Exposed to Drought and Forest Fires. *International Journal of Environmental Research and Public Health*, 19(20), 13682. <https://doi.org/10.3390/ijerph192013682>
- Calderan, S. (2021). *Atlantic White-Sided Dolphins in the Northeast Atlantic: Population Status and Structure* (p. 15). OceanCare. https://www.oceancare.org/wp-content/uploads/2022/11/Atlantic_White_Sided_Dolphins_NE_Atlantic_Report_Calderan_EN_15p_2021.pdf#page=8.69
- Cornelsen, C. T., MacQuarrie, C. J. K., & Lee, S.-I. (2024). Modeling the Distribution of Hemlock Woolly Adelgid Under Several Climate Change Scenarios. *Canadian*

- Journal of Forest Research*, 54(12), 1458–1470. <https://doi.org/10.1139/cjfr-2023-0275>
- Cover, S. (2025, April 23). *With Low Humidity and High Winds, It's a Dangerous Time for Wildfires in Maine* [News Website]. Spectrum Local News - Maine. <https://spectrumlocalnews.com/me/maine/public-safety/2025/04/23/with-low-humidity-and-high-winds--it-s-a-dangerous-time-for-wildfires-in-maine>
- Davidson, R. K., Ličina, T., Gorini, L., & Milner, J. M. (2015). Endoparasites in a Norwegian Moose (*Alces alces*) Population – Faunal Diversity, Abundance, and Body Condition. *International Journal for Parasitology: Parasites and Wildlife*, 4(1), 29–36. <https://doi.org/10.1016/j.ijppaw.2014.12.005>
- Debow, J., Blouin, J., Rosenblatt, E., Alexander, C., Gieder, K., Cottrell, W., Murdoch, J., & Donovan, T. (2021). Effects of Winter Ticks and Internal Parasites on Moose Survival in Vermont, USA. *The Journal of Wildlife Management*, 85(7), 1423–1439. <https://doi.org/10.1002/jwmg.22101>
- Er, S., Murat, M., Ata, E. E., Köse, S., & Buzlu, S. (2024). Nursing Students' Mental Health: How Does Eco-Anxiety Effect? *International Journal of Mental Health Nursing*, 33(5), 1315–1326. <https://doi.org/10.1111/inm.13320>
- Gupta, A. (2024). Climate Change and the Unthinkable: An Ecocritical Study of Climate Fiction. *International Journal of Creative Research Thoughts (IJCRT)*, 12(10), b628–b636.
- Havill, N. P., Vieira, L. C., & Salom, S. M. (2014). *Biology and Control of Hemlock Woolly Adelgid*. (No. FHTET-2014-05; Forest Health Technology Enterprise Team Report, p. 21). U.S. Department of Agriculture, Forest Service, Forest Health Technology Enterprise Team (FHTET). <https://www.fs.usda.gov/foresthealth/technology/pdfs/HWA-FHTET-2014-05.pdf>
- Islam, M. S., & Kieu, E. (2021). Sociological Perspectives on Climate Change and Society: A Review. *Climate*, 9(1), Article 1. <https://doi.org/10.3390/cli9010007>
- Jourdain, N. C., Amory, C., Kittel, C., & Durand, G. (2025). Changes in Antarctic Surface Conditions and Potential for Ice Shelf Hydrofracturing from 1850 to 2200. *The Cryosphere*, 19(4), 1641–1674. <https://doi.org/10.5194/tc-19-1641-2025>
- Khandelwal, A., & Dhand, D. (2024). Role of Literature in Addressing the Climate Crisis in Amitav Ghosh Novel *The Gun Island*. *ShodhKosh: Journal of Visual and Performing Arts*, 5(1), Article 1. <https://doi.org/10.29121/shodhkosh.v5.i1.2024.2790>
- Kirwan, M. L., & Gedan, K. B. (2019). Sea-Level Driven Land Conversion and the Formation of Ghost Forests. *Nature Climate Change*, 9(6), 450–457. <https://doi.org/10.1038/s41558-019-0488-7>
- Koder, J., Dunk, J., & Rhodes, P. (2023). Climate Distress: A Review of Current Psychological Research and Practice. *Sustainability*, 15(10), Article 10. <https://doi.org/10.3390/su15108115>
- Last, J. M., Trouton, K., & Pengelly, D. (1998). *Taking Our Breath Away: The Health Effects of Air Pollution and Climate Change*. David Suzuki Foundation.
- Malhi, Y., Franklin, J., Seddon, N., Solan, M., Turner, M. G., Field, C. B., & Knowlton, N. (2020). Climate Change and Ecosystems: Threats, Opportunities and Solutions. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 375(1794), 20190104. <https://doi.org/10.1098/rstb.2019.0104>

- Mason, E., Beaudreau, A. H., Arnold, S. N., Belknap, S., & Scalisi, E. D. (2024). Adaptive Capacity of the Maine Lobster Fishery: Insights From the Maine Fishermen's Climate Roundtables. *Canadian Science Publishing*, 9, 1–13. <https://doi.org/10.1139/facets-2023-0193>
- Mathers-Jones, J., & Todd, J. (2023). Ecological Anxiety and Pro-environmental Behaviour: The Role of Attention. *Journal of Anxiety Disorders*, 98, 102745. <https://doi.org/10.1016/j.janxdis.2023.102745>
- McCarty, E. P., & Adesso, K. M. (2019). Hemlock Woolly Adelgid (Hemiptera: Adelgidae) Management in Forest, Landscape, and Nursery Production. *Journal of Insect Science*, 19(2), iez031. <https://doi.org/10.1093/jisesa/iez031>
- McDermott, A. (2023). Ghost forests haunt the East Coast, harbingers of sea-level rise. *Proceedings of the National Academy of Sciences*, 120(38), e2314607120. <https://doi.org/10.1073/pnas.2314607120>
- Metych, M. (2025, June 13). *Ghost Forests Are Becoming the New Haunts of Climate Change* [Encyclopedia Website]. Britannice. <https://www.britannica.com/story/ghost-forests-are-becoming-the-new-haunts-of-climate-change>
- Mohan, J. E., Wadgyamar, S. M., Winkler, D. E., Anderson, J. T., Frankson, P. T., Hannifin, R., Benavides, K., Kueppers, L. M., & Melillo, J. M. (2019). Chapter 3 – Plant Reproductive Fitness and Phenology Responses to Climate Warming: Results From Native Populations, Communities, and Ecosystems. In J. E. Mohan (Ed.), *Ecosystem Consequences of Soil Warming* (pp. 61–102). Academic Press. <https://doi.org/10.1016/B978-0-12-813493-1.00004-1>
- NASA. (2022, June 15). *Scientific Consensus*. NASA Science. <https://science.nasa.gov/climate-change/scientific-consensus/>
- Patil, S., & Lahane, B. T. (Dr). (2024). Climate Fiction, an Emerging and Influential Genre of 21st Century: A Study. *Research Nebula*, 13(3), 76–83. <https://doi.org/10.22183>
- Pihkala, P. (2020). Anxiety and the Ecological Crisis: An Analysis of Eco-Anxiety and Climate Anxiety. *Sustainability*, 12(19), Article 19. <https://doi.org/10.3390/su12197836>
- Phillips, C., & Murphy, C. (2021). Solastalgia, Place Attachment and Disruption: Insights From a Coastal Community on the Front Line. *Regional Environmental Change*, 21(2), 46. <https://doi.org/10.1007/s10113-021-01778-y>
- Radhakrishnan, G. V. (2025). The Role of Literature in Shaping Environmental Consciousness: Ecocritical Perspectives in Modern English Literature. *Advances in Consumer Research*, 2(1), 24–31.
- Rani, V., & Snehi, D. (2023). Climate Change Narratives: The Role of Literature in Shaping Environmental Awareness. *International Journal of Advance Research in Multidisciplinary*, 1(1), 897–904.
- Riedy, C. (2016). Climate Change. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology* (pp. 1–8). John Wiley & Sons. <https://doi.org/10.1002/9781405165518.wbeos0737>
- Robustelli, T., Bonnyman, H., & Panfil, Y. (2024). *Climate Migration's Impact on Housing Security in the United States* (Future Land & Housing). New America.

- <http://newamerica.org/future-land-housing/reports/climate-migrations-impact-on-housing-security/>
- Santos, F. D., Ferreira, P. L., & Pedersen, J. S. T. (2022). The Climate Change Challenge: A Review of the Barriers and Solutions to Deliver a Paris Solution. *Climate*, 10(5), Article 5. <https://doi.org/10.3390/cli10050075>
- Scientific and Technical Subcommittee of the Maine Climate Council. (2024). *Scientific Assessment of Climate Change and Its Effect in Maine 20214 Update: Executive Summary* [Executive Summary]. Maine Climate Council. https://www.maine.gov/future/sites/maine.gov.future/files/inline-files/STS_EXSUM_2024.pdf
- Serraglio, D. A., Ferreira, H. S., & Robinson, N. A. (2019). Climate-Induced Migration and Resilient Cities: A New Urban Agenda for Sustainable Development. *Seqüência: Estudos Jurídicos e Políticos*, 41(83), 10–46. <https://doi.org/10.5007/2177-7055.2019v41n83p10>
- Sintayehu, D. W. (2018). Impact of Climate Change on Biodiversity and Associated Key Ecosystem Services in Africa: A Systematic Review. *Ecosystem Health and Sustainability*, 4(9), 225–239. <https://doi.org/10.1080/20964129.2018.1530054>
- Sun, S., Pattyn, F., Simon, E. G., Albrecht, T., Cornford, S., Calov, R., Dumas, C., Gillet-Chaulet, F., Goelzer, H., Golledge, N. R., Greve, R., Hoffman, M. J., Humbert, A., Kazmierczak, E., Kleiner, T., Leguy, G. R., Lipscomb, W. H., Martin, D., Morlighem, M., ... Zhang, T. (2020). Antarctic Ice Sheet Response to Sudden and Sustained Ice-Shelf Collapse (ABUMIP). *Journal of Glaciology*, 66(260), 891–904. <https://doi.org/10.1017/jog.2020.67>
- Tang, K. H. D. (2021). Climate Change and Its Impacts on Mental Wellbeing. *Global Academic Journal of Humanities and Social Sciences*, 3(4), 144–151. <https://doi.org/10.36348/gajhss.2021.v03i04.003>
- Thompson, C. (2010). *State of the Gulf of Maine Report* (State of the Gulf of Maine Report, p. 56). Gulf of Maine Council on the Marine Environment.
- U.S Environmental Protection Agency. (2024). *Climate Change Indicators in the United States (Fifth ed.)* (Report No. EPA 430-R-24-003; pp. 1–96). U.S. Environmental Protection Agency. https://www.epa.gov/system/files/documents/2024-07/climate_indicators_2024.pdf
- Vitkovic, S., & Soleimani, D. (2019). The Economic and Social Impacts of Water Scarcity in the IR Iran. *IJASOS- International E-Journal of Advances in Social Sciences*, 5(13), Article 13. <https://doi.org/10.18769/ijasos.531330>
- Walter, A. W., Morocho, C., King, L., Bartlett, J., Kelsey, D., DeSousa, M., Biesecker, G., & Punnett, L. (2018). Preventing Opioid Use Disorders among Fishing Industry Workers. *International Journal of Environmental Research and Public Health*, 15(4), Article 4. <https://doi.org/10.3390/ijerph15040648>
- World Health Organization. (n.d.). *Climate Change* [Official health information website]. World Health Organization (WHO). Retrieved May 28, 2025, from <https://www.who.int/health-topics/climate-change>
- Yakovlev, V. A., & Belyaev, G. A. (2023). Global Climate Change, Its Consequences and Ways to Solve the Problem. *E3S Web of Conferences*, 390, 04007. <https://doi.org/10.1051/e3sconf/202339004007>

- Zargan, J., & Waez-Mousavi, S. M. (2016). Water Crisis in Iran: Its Intensity, Causes and Confronting Strategies. *Indian Journal of Science and Technology*, 9(44), 1–6. <https://doi.org/10.17485/ijst/2016/v9i44/100632>
- Zhang, S. (2020). *Improving Sea Level Fingerprints Associated with Future Land Ice Melting* [Honours Thesis, University of Tasmania]. https://data.imas.utas.edu.au/attachments/5a2a7cd8-f91a-4a05-9e1d-290873d22279/Shujing_Zhang_-_Thesis.pdf