

Climate Change and Cultural Anxieties: An Exploration of Dystopian Novels from Before and
After Global Warming

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Climate change is one of the most pressing issues of the twenty-first century. However, despite the urgency of the problem, popular political narratives fail to address the issue, suggesting to constituents that climate change is less important than the economy. With this in mind, my research examines whether the public can meaningfully engage with climate change through other popular mediums; namely the novel. In order to gauge concern about climate change, I compared dystopian novels written before and after the year “global warming” was first coined (1975), with the expectation that dystopian novels written after the widespread recognition of global warming would engage more deeply with environmental concerns than their earlier counterparts. This research revealed that there is not a clear-cut difference in environmental representations between pre- and post-1975 dystopias. Rather, the novels fall along a continuum of environmental engagement, with newer novels being more likely to engage with Ursula Heise’s “triple allegiance” of ecocriticism. The greatest difference between novels written before and after “global warming” is their treatment of technological solutions to the climate crisis; newer dystopian works demonstrate how such techno-utopian solutions ultimately fail to address the root causes of the climate crisis, and will do little to mitigate the problems of climate change unless accompanied by social change.

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Chapter 1

Global climate change is one of the defining issues of the twenty-first century, whether its importance is reflected in popular culture and media or dismissed as fear-mongering. Regardless of one's stance on climate change, responses to the climate crisis "saturate our sense of the now" (Chakrabarty, "Climate" 32). However, despite the saturation of the present moment with various responses to and representations of climate change, there seems to be little meaningful engagement by the average person with this issue; as Amitav Gosh puts it, "politicization has not translated into a wider engagement with the crisis of climate change" (125). For the most part, we are able to escape these concerns-- turning to television, popular culture and even popular literature to avoid engagement with the climate crisis. Further, popular political narratives about climate change do not engage with the crisis in any meaningful way, suggesting to constituents that climate change is less important than issues like the economy and job creation.

Imre Szeman has described such types of evasive political discourses; both "strategic realism" and "techno-utopianism" are ways of talking about the environment while really talking about the economy, whereas "apocalyptic environmentalism" suggests the need for social change. The first two types of popular discourse concern themselves with political maneuvering focused on the maintenance and protection of the nation state and status quo, or focus on technological *deus-ex-machinas* to save us from our destruction of the planet on which we depend (Szeman 59, 61). Amitav Gosh recognizes a similar political phenomenon, wherein "climate change is not a danger in itself; it is envisaged rather as a 'threat multiplier'" against which "the tasks of the nation-state... will be those of keeping 'blood-dimmed tides' of climate refugees at bay and protecting their own resources" (Gosh 143). While such political discourses do not deny climate change outright, they divert our attention from the urgency of the crisis and

the need for drastic change to our lifestyles and social systems. Without political narratives that address the urgency of the climate crisis, how can the average person begin to understand or act on it?

Can literature fill the gap left between popular and political narratives about climate change, opening a space for the average person to reflect on these issues? Writing about the role of nuclear fiction in the 1950s, Peter Schwenger writes that fiction “[did] not dictate a response to the ... threat so much as...make response possible” (48). Can literature play a similar role in regard to climate change? If the “challenge of the climate crisis” is “to imagine other forms of human existence” (Gosh 128), can literature help in this regard by allowing readers to “approach the world in a subjunctive mode” and thus “make possible the imagining of possibilities” (Gosh 128)? This research examines how the environment is portrayed in dystopian fiction in order to determine how authors—and by extension their readers—deal with the climate crisis both before and after the crisis was commonly acknowledged.

Ecocritic Kate Rigby claims that “nature is only thematic in literature when it becomes a problem in reality” (358). My research seeks to verify this statement by undertaking an ecocritical reading of several dystopian novels from before and after the year 1975, when the term “global warming” first entered the lexicon. All of these novels deal with the environment in some way or another; my goal is to identify similarities and differences between environmental representations. Given Rigby’s assertion, I would anticipate that following the coining of “global warming,” we should see increased representations of the environment and the climate crisis in fiction. That is, nature (or the environment) should become thematic in literature; as we’ve come to understand global warming and the climate crisis, it is clear that nature has become a problem in reality.

Despite Rigby's claim, Amitav Gosh, questions why representations of climate change are so rare in literature. He writes, "that climate change casts a much smaller shadow within the landscape of literary fiction than it does even in the public arena is not hard to establish. To see that this is so, we need only glance through the pages of a few highly regarded literary journals" (Gosh 7). While in general Gosh is disappointed by the lack of representation of the environment and of climate change in "serious" literary fiction, he does acknowledge that "the mere mention of the subject is often enough to relegate a novel or a short story to the genre of science fiction. It is as though in the literary imagination climate change were somehow akin to extraterrestrials or interplanetary travel" (7).

Science fiction seems more willing to engage questions of climate change; for this reason, science fiction is the genre I have chosen to focus my research on. However, I want to make clear that this does not mean that climate change is relegated to the realm of the imaginary; rather, through the use of cognitive estrangement, science fiction does not "posit another superordinate...reality but an alternative on the same ontological level as the author's empirical reality... an *alternate reality*...[which] overtly or tacitly presupposes the existence of the author's empirical reality, since it can be gauged and understood only as the empirical reality modified in such-and-such ways" (Suvin 71). What this means is that by using the reader's empirical reality as a reference point and modifying it slightly (often through the use of defamiliarization), science fiction authors may be best suited to address climate change in their works. The question my research undertakes is whether modern (post-1975) dystopian science fiction texts emphasize climate change in their novels. I am interested in whether the environment is portrayed differently before and after the development of the language to address global climate change, or if as Gosh bemoans, climate change remains a marginal issue.

In addition to the formal elements that facilitate science fiction's portrayal of the climate crisis, it also has thematic advantages as well. Lawrence Buell argues that "no genre potentially matches up with a planetary level of thinking 'environment' better than science fiction does" (57), noting that "for half a century science fiction has taken a keen, if not consistent interest in ecology, in planetary endangerment, in environmental ethics, in humankind's relation to the nonhuman world" (56). This interest in the natural world, along with science fiction's penchant for defamiliarization and its close ties with dystopian literature, make it an ideal genre for examining how climate change is portrayed in literature.

Global warming was first coined as a term and recognized as a phenomenon in 1975 by Wallace Broecker. In his paper "Climatic Change: Are we on the Brink of a Pronounced Global Warming?" Broecker argues that the world is on the brink of a pronounced warming trend due to carbon dioxide emissions and that until "chemical fuel consumption is dramatically reduced, global temperatures will continue to rise" exceeding historical highs by the year 2000 (Broecker 462). Given that dystopian literature reflects cultural anxieties, examining dystopian science fiction from the periods before and after global warming entered the lexicon should reflect cultural engagement with the issue. If global warming is a common concern, once the concept becomes popularized one would anticipate that it would be reflected more often in the literature than it was before it was discovered. To determine whether this does, in fact, occur, I do an ecocritical analysis of eight novels (three from pre-1975, five from post-1975) focusing on how the environment is portrayed and used as a plot element in both sets of novels. From the period before 1975, I consider J. G. Ballard's *The Drowned World*, Ursula Le Guin's *The Word For World Is Forest*, and Walter Miller Jr.'s *A Canticle for Leibowitz*. From the period following 1975 I consider Margaret Atwood's MaddAddam trilogy (*Oryx and Crake*, *The Year of the*

Flood, and *MaddAddam*) as well as two novels by Paolo Bacigalupi: *The Windup Girl* and *The Water Knife*.

Ecocritical Approach

There are two key ideas mentioned above that are critical to my ecocritical approach. The first is Rigby's assertion that "nature is only thematic...when it becomes a problem" (358). The second is Buell's claim that science fiction is the best genre for thinking about the planet and the environment (57). Both claims come from respected ecocritics, a field that emerged as concerns about climate change rose to increasing popularity. Using an ecocritical approach, my research will examine whether these claims apply equally to dystopian fiction from before and after "global warming" was coined in 1975, or whether they are only applicable to newer works.

Ursula K. Heise asserts that ecocriticism has a "triple allegiance" to "the scientific study of nature, the scholarly analysis of cultural representations, and the political struggle for more sustainable ways of inhabiting the natural world" (506). Although these are broad criteria comprising fields of study in their own rights, when combined in an ecocritical literary analysis, they foster insights about humanity's relationship to the natural world. My analysis employs this "triple allegiance" by recognizing the impacts of anthropogenic climate change on the environment as well as human populations, and how these are portrayed in literature. As its name implies, ecocriticism is born of an understanding of the biological science of ecology. Although literary criticism often employs ecology "by means of mere metaphor" (Phillips qtd. In Heise 510), and relies on outdated and idealistic ideas of ecology, we cannot discount the value of an ecocritical approach, nor can we ignore how ecology is understood and employed by authors and literary critics alike.

For my research this entails an understanding of the ecological effects of anthropogenic

climate change. Further, my ecological analysis also considers cultural representations of nature; that is, how dominant ideologies shape the depiction of nature by the author, and how these influence nature's treatment by characters in the novel. For my research this has primarily meant understanding how instrumentalist philosophies and capitalist ideologies impact the depiction and treatment of the natural world. Finally, as Heise writes, ecocriticism involves a political dimension; it is involved in a political struggle about how we interpret nature, and how we should think about the environment. Literary criticism involves a statement about how a person interprets texts, and ecocriticism involves reading them in such a way that they are amenable to thinking about sustainability and environmentally friendly practices. My research determines whether these elements of the "triple allegiance" differ in novels written before and after 1975; does the new science, cultural narrative, and political struggle impact the literature?

Supporting Buell's claim that science fiction can think 'environment,' Lance Newman discusses how nature writing (either fictional or critical) is an amorphous genre:

it is "not a stable form of reaction to a stable problem...It is a dynamic tradition of response to the rise and development of the capitalist eco-social order...how nature writers see and understand nature has everything to do with how they see and understand the society whose relations they hope to change" (qtd. In Buell 27).

Newman's argument ties together major themes of environmental and dystopian literature, indicating how the two genres are not mutually exclusive, and can work in concert to address climate change. Nature and culture, despite the long-standing division between the two, are not mutually exclusive. Rather, as Newman argues and many dystopian novels demonstrate, they are interdependent, and affect one another in a feedback-loop like mechanism. Both nature writing and dystopian literature offer readers a way of understanding the world. Their genres are "more

than a collection of formal features” but are also “epistemological tools,” ways of “knowing and seeing” the represented worlds (Tobin 318).

Why Dystopian Literature

Like ecocriticism, dystopian literature involves political and ideological dimensions; it critiques existing social conditions or political systems. While it is impossible to deny how the environment is inherently impacted by social and political systems, I would argue that environmental degradation can become dystopian in itself; this is reflected by dystopias critical of environmental degradation, such as those written by Paolo Bacigalupi and Ursula Le Guin. Patrick Murphy claims that the purpose of dystopian literature is not horror, but forewarning (26). Forewarning is crucial in regards to climate change; dystopian novels warn readers about the threats to our world and lifestyles if immediate action is not taken. In fact, many scholars argue one of the goals of dystopian literature is to motivate the type of social action required by the climate crisis. Patrick Murphy writes, “Many dystopian writers would be entirely dissatisfied if their novels led people only to understanding and not to any type of social action” (Murphy 26).

In her essay “*The Handmaid’s Tale* and *Oryx and Crake* in Context” Margaret Atwood addresses the question of whether she considers her fiction to be dystopian, a question that can be asked and answered about the other novels included in my research. Atwood does not consider *Oryx and Crake* (the first novel in the *MaddAddam* trilogy) to be dystopian, because we are not given an overview of “the structure of the society;” while it has dystopian elements it cannot be deemed a classic dystopia (Atwood 517). Despite this argument, it seems that we can infer enough of the social structure in Atwood’s fictional society-- particularly when we consider the trilogy as a whole--that it remains a valid vehicle for considering the questions of whether we

see environmental concern or environmental dystopias in novels from the period after 1975. Keith Booker further defines dystopian literature as constituting a “critique of existing social conditions or political systems, either through the critical examination of the utopian premises upon which those conditions and systems are based or through the imaginative extension of those conditions and systems into different contexts that more clearly reveal their flaws and contradictions” (Booker 3). Even without a clear picture of the “structure of society” in some of the novels analyzed, the novels provide either a critical examination or imaginative extension of their conditions, thereby rendering them dystopian. Furthermore, I believe that poor environmental conditions are enough to create a dystopian society and novel on their own.

There are formal and generic elements that make dystopian literature an effective means for discussing the climate crisis. Most dystopian novels are either science or speculative fiction, thus frequently employ cognitive estrangement and defamiliarization. Although there are slight differences between science fiction and speculative fiction, they share many similarities. In “*The Handmaid’s Tale* and *Oryx and Crake* in Context,” Margaret Atwood addresses this generic distinction, writing that for her, “science fiction proper...denotes books with things in them we can’t yet do or begin to do, talking beings we can never meet, and places we can’t go—and speculative fiction, which employs the means already more or less to hand, and takes place on Planet Earth” (513). Given Atwood’s definition, many, if not most of the novels analyzed in my research could be classified as speculative fiction; however, they are often found in science fiction sections, marketed as science fiction, and often identified as such by their authors. Thus, for the purpose of my research, it will be helpful to pigeonhole science and speculative fiction, as they share many generic features.

One common feature shared by science and speculative fictions is the use of cognitive

estrangement. Science fiction, according to Darko Suvin, is the genre of *cognitive estrangement*. That is, it reports fiction factually, which, per Perry Nodelman has the effect of distancing us from our assumptions about reality (24). Science fiction portrays a new set of norms realistically (cognitively) and sees these new norms as “unique, unchangeable, and therefore subject to a *cognitive view*” (Suvin 7). This means that the differences of the new world (or the ‘novum’) must be explained by familiar systems or be extensions of them; that is, “the [new world] must be the same but different to the readers” (Nodelman 25). It is this “same but different” that makes science fiction (and thus dystopian literature) such a powerful genre for my research questions, as it does not alienate readers by suggesting that the story is purely fiction or could not happen to them; the similarities force readers to think critically about their own societies and situations. As Rachel Wilkinson puts it, dystopian visions can help us “deconstruct our contexts,” so that we can challenge them (25).

Similar in effect to cognitive estrangement, both science fiction and speculative fiction (and thus dystopian literature) employ defamiliarization. That is, they make the familiar strange. For Frederic Jameson, the primary function of science fiction is “not to give us ‘images’ of the future...but rather to defamiliarize and restructure our experience of our own *present*” (151, emphasis original). Keith Booker reflects this idea when he writes, “I consider the principal literary strategy of dystopian literature to be defamiliarization: by focusing their critiques of society on imaginatively distant settings, dystopian fictions provide fresh perspectives on problematic social and political practice that may otherwise be taken for granted or considered natural and inevitable” (3-4). This function can be particularly valuable when the thing defamiliarized is climate change and the systems that make climate change seem inevitable.

Defamiliarization can catalyze a different way of thinking in which readers recognize how

their present does not need to be taken for granted, and how it could lead to highly problematic futures. By demonstrating how easily the empirical reality could be altered, or how similar the empirical and alternate realities truly are, readers may be more likely to engage with the issues that climate change presents. Jameson suggests that “most characteristic SF does not seriously attempt to imagine the ‘real’ future...Rather, its multiple mock futures serve the quite different function of transforming our own present into the determinate past of something yet to come” (152). This temporal manipulation is a critical feature of science fiction; as Greg Garrard explains in *Ecocriticism*, “only if we imagine that the planet *has* a future are we likely to take responsibility for it” (qtd. In Hambrick 131). If science fiction can demonstrate how the future is at stake through the changing environment, can it encourage readers to engage with these issues and act to change them?

To attempt to answer these questions I considered a number of novels written and published before and after the year 1975. I generally looked for novels with an environmental bent, regardless of when they were written, as I felt that this would allow me to make a better comparison about environmental attitudes from their respective periods. I have also included a novel from pre-1975 whose dystopian nature is related to the nuclear apocalypse, as this novel reflects cultural anxieties about the Cold War and Arms Race, lending support to the idea that cultural anxieties are reflected in popular literature. Furthermore, nuclear apocalypse novels, which represent early examples of man-made disaster or apocalypse, can be taken as early examples of “global climate change” in the scope of their disasters.

As mentioned above, not all of the novels analyzed can properly be considered science fiction, or are not classified as such by their authors. However, as explained above it is helpful to pigeonhole the two genres, in order to understand how the tools employed by both genres work

within each text and on readers. According to Atwood, one of speculative fiction's characteristics is its ability to "bring us the news," to "speak of what is past and passing, but especially of what's to come" (515). I see no reason why science fiction cannot be said to do the same, especially given the futurological orientation of many science fiction texts. I also consider broadly the categories of hard and soft science fiction, and how these generic classifications impact the dystopian elements or diegesis of each novel. For example, the majority of the novels in the second chapter should be considered soft science fiction, reacting against the technological utopianism of earlier hard science fiction. Although soft science fiction is typically associated with a specific period, we can see its influence through the mistrust of scientific development and solutions in the later novels presented in the third chapter.

Chapter 2

A Canticle for Leibowitz

Although not directly related to the idea of global warming or climate change, we can draw many parallels between the nuclear fiction of the 1950s and 60s to modern climate fiction. As I would expect global warming to increase in its novelistic representations after 1975, so Michael Strada argues that “since the fifties was a formative nuclear decade, one would expect shared images to begin emerging from groups in the society” (179). In his essay, “Kaleidoscopic Nuclear Images of the Fifties,” Strada traces popular representations of the atom bomb, from those portrayed by policy and politicians, to those of the science fiction community, both in literature and film. Strada uncovers “severe pessimism, even fatalism” about nuclear weapons portrayed in science fiction literature (182).

New wave science fiction, to which the majority of the novels in this chapter belong, is characterized by a profound mistrust of science and ‘progress,’ and these themes are reflected in both nuclear apocalypse fiction and climate fiction. While most nuclear apocalypse stories are highly anthropocentric, and don’t look explicitly at the environment, we can infer the environmental conditions through the dystopian nature of nuclear apocalypse tales, and can even read such novels as early (albeit in a very different sense) global climate change novels. As Schwenger writes, “the defining feature of a nuclear holocaust, the one that sets it apart from its apocalyptic predecessors, is that this apocalypse is man-made” (37). This feature may set nuclear fiction apart from earlier apocalyptic novels, but it links it to more modern climate apocalypses as global warming is also a man-made disaster. While the apocalypse in nuclear fiction does not occur through carbon and GHG emissions and warming, humankind (through the use of atomic weapons) still destroys their environments, resulting in atomic wastelands in which human life

must struggle against the environment to survive. The human desire for world power ultimately destroys the world as they know it; radiation kills or mutates most life forms and results in dramatically altered environments and ecosystems. As Claire Sponsler writes, “traditional post-apocalyptic narratives play out their human struggles within a hostile and alienating ecology, an ecology that to a large extent defines their limited choices” (254). This struggle can be identified in Walter Miller Jr.’s *A Canticle for Leibowitz*, as humans must contend with both genetic mutations and perpetual drought, making life in the desert a constant struggle.

A Canticle for Leibowitz spans 17 centuries, and follows the monastic Order of the Blessed Leibowitz as their order preserves knowledge through the dark ages of the Simplification, ultimately leading to a period of enlightenment and progress. Leibowitz, once a nuclear weapons scientist of the Age of Enlightenment (defined, by the monks of the Leibowitzan order as the fifth and sixth decades of the twentieth century), survives the fallout of the nuclear apocalypse, repents, and joins the monastic life where he and his brethren seek to preserve as many books and as much knowledge as they can during the Simplification that follows the apocalypse. Angered by the destruction wrought by nuclear war, the masses let loose their rage on those responsible, making a “holocaust of those who wrought [the] crime,” and destroying their works and knowledge, creating a “great simplification” such that the world could begin anew (Miller 63). Miller’s novel follows the order beginning six centuries after the Flame Deluge (the nuclear war) to 3781, through the eyes of several monks in the order (Brother Francis, Dom Paulo, Dom Zerchi and Brother Joshua) when the novel comes full circle. The world no longer lives in an age of darkness. The monastery is no longer the sole purveyor of knowledge, and technology has been re-developed. There are self-driving cars, starships, and atomic weapons....

While the diegesis is primarily anthropocentric, with a focus on the human struggles to

preserve and use knowledge ethically in a post-apocalyptic world, the natural world is a backdrop that cannot be ignored. Miller uses the desert environment as a plot element to suggest the constancy of nature in the face of an ever-changing society, while simultaneously demonstrating the effects of human actions on the desert ecosystem. However, Miller's is not a lush nature suggesting an imperviousness to humanity as we see in later novels; rather, the monastery is located in a desert, where drought persists and the sun-scorched earth hides a variety of dangers, such as "sun-crazed rattlers and brooding thunderstorms over the mountains, or rabid dogs and tempers made vicious by the scorch" (Miller 154). It is these creatures and scavengers of the desert--such as the ever-present vultures-- that are given pride of place in the novel. The vultures indicate the continuity of time and of nature as they appear at the end of the first two sections, "*Fiat Homo*" and "*Fiat Lux*." While each section ends with the death of a primary character, both emphasize the vultures' ability to survive the ravages of time, accepting only what nature provides them with.

There was a dead hog beyond the Valley of the Misborn. The buzzards observed it gaily and glided down for a feast. Later, in a far mountain pass, a cougar licked her chops and left her kill. The buzzards seemed thankful for the chance to finish her meal. The buzzards laid their eggs in season and lovingly fed their young: a dead snake, and bits of a feral dog. The younger generation waxed strong, soared high and far on black wings, waiting for the fruitful Earth to yield up her bountiful carrion. Sometimes dinner was only a toad. Once it was a messenger from New Rome. (Miller 118)

The repeat appearance of the vultures and the reference to their lifecycles creates a sense of continuity in the novel, contributing to its cyclical nature. Just like the vultures, the rise and fall of human civilization is presented as cyclical; however, rather than being presented in a positive

cycle of birth and re-birth, the development and rise and fall of human civilization is a cycle of destruction. This is emphasized by the lack of vultures at the end of the final section, *Fiat Voluntas Tua*. The humans in the novel are contrasted with the buzzards. Where the buzzards seem thankful for scraps, the humans are not, and are constantly striving for ‘progress,’ ultimately leading to cycles of nuclear devastation. By the end of the novel, life on earth only seems to persist in the ocean, and it is scarce even there: “The ash fell into the sea and into the breakers. The breakers washed dead shrimp ashore and into the driftwood. Then they washed up the whiting. The shark swam out to his deepest waters and brooded in the old clean currents. He was very hungry that season” (Miller 338). Nature is persistent, but only to a certain degree. While it is constant over time, the already barren desert environment cannot withstand a second nuclear war; humans are not the only beings to suffer the consequences of their actions; so are all living organisms except those who live in the depths of the ocean.

Despite the resurgence of both human and animal life in the desert during the time of the novel, Miller makes it clear that this was not always so. The novel is set after the Flame Deluge, the first global nuclear war enacted by humanity, and its devastating effects are still seen in the environment; it is a desert wasteland in perpetual drought, where little life has been unaffected by atomic radiation. On discovering the Fallout Shelter, Brother Francis meditates on the Flame Deluge and its aftermath. Not only do cities become “puddles of glass” and nations “vanish from the earth” (Miller 63), but the blast also has significant impacts on the natural world and environment.

The land is littered with dead bodies, belonging to men, cattle, and “all manner of beasts, together with the birds of the air and all things that flew, all things that swam in the rivers, crept in the grass, or burrowed in holes” (Miller 63). Furthermore, the fallout “engulfed the forests and

the fields, withering trees and causing the crops to die,” creating deserts where there once was life (Miller 63). This description of the world post-Flame-Deluge demonstrates a type of global climate change, as “many died even in those lands where the weapons had not struck, because of the poisoned air” (Miller 63). Miller’s description of this world is reminiscent of early environmentalist texts, such as the preamble to Rachel Carson’s *Silent Spring*, “A Fable for Tomorrow,” in which she describes the effects of DDT and other pesticides:

Some evil spell had settled on the community: mysterious maladies swept the flocks of chickens; the cattle and the sheep sickened and died. Everywhere was a shadow of death....There was a strange stillness. The birds, for example—where had they gone?...On the farms, hens brooded, but no chickens hatched. The farmers complained that they were unable to raise any pigs—the litters were small and the young survived only a few days” (Carson 21-2).

As Carson continues, “no witchcraft, no enemy action had silenced the re-birth of new life in this stricken world. The people had done it themselves” (22). This is the most persistent theme in Miller’s novel; that of responsibility. Despite the fact that it is atomic war that decimates the population and the landscape, it is not enough to place the blame on the weaponry, but rather, as Dom Zerchi recognizes at the end of the novel, responsibility is both individual and shared: “Thee me Adam Man we. No ‘worldly evil’ except that which is introduced into the world by man” (330).

Although Miller was writing about atomic warfare and the arms race, the theme of responsibility is one that can be extended and applied to today’s climate crisis. In fact, there are many references to ‘Nature’ in Miller’s novel, and although the monks in the novel refer to nature in less of an environmental sense and more of an ethical one, I argue that we can learn

how to approach the relationship between science, development and the natural world during the climate crisis through a reading of *A Canticle for Leibowitz*. Michael Bennett writes that “like most novels in this [nuclear apocalypse] genre, *Canticle* explores the horror that awaits if present trends (the arms race for example) are not reversed” (484). By taking a broader approach, there are also other trends that the novel warns against, such as unethical scientific development and the instrumentalization of nature.

The Order of Saint Leibowitz, founded by Isaac Edward Leibowitz and originally named after Albertus Magnus, patron of men of science, was founded during the Simplification in order to “preserve human history for the great-great-great-grandchildren of the children of the simpletons who wanted it destroyed” (Miller 65). Although its goal is noble, by preserving not just human history but also the scientific knowledge that led to the post-apocalyptic world and the simplification, the Order ultimately enables humanity to repeat its fate. As Michael Strada points out, Leibowitz was a weapons specialist before the Deluge, and by “worshipping this martyr at an altar of science, the followers of his Order of Saint Leibowitz can only lead the way to another Flame Deluge” (185). Despite the repetition of nuclear apocalypse and the cyclical nature of the novel, Miller does not present readers with a solution for this problem. Although in actuality we have avoided nuclear annihilation, the true problem in *A Canticle for Leibowitz* is ‘human nature,’ perhaps better described as human hubris and striving. This problem remains present in modern climate fiction, and is recognizable in both Atwood’s *MaddAddam* trilogy and Paolo Bacigalupi’s *The Windup Girl* and *The Water Knife*.

The monks of the Order wax and wane about the ethics of the developing interest in science and ‘progress,’ and yet, they ultimately do not intervene in their development by so-called ‘secular scholars’. While in the novel the twentieth century is referred to as the “Age of

Enlightenment” (Miller 28) these ambitions harken back to our own “Enlightenment Period” of the eighteenth century, to which the separation of nature and culture can be traced. This separation becomes an ethical dilemma in the novel; the instrumentalization of the natural world can lead to unchecked ‘progress,’ which the monks recognize is more akin to destruction. This ethical dilemma is presented in the second section of the novel, *Fiat Lux* (let there be light), in which scholar Thon Taddeo visits the monastery in order to learn from the natural science texts preserved in the memorabilia. Dom Paulo is conflicted about welcoming progress to the monastery; he cannot shake the feeling that with progress comes trouble, thinking of the Thon: “the king was coming to weigh books in the basement with his pair of crooked scales” (155), and wondering about Taddeo’s crookedness. As Ralph Wood puts it:

[Taddeo’s] request puts the Order of Leibowitz in a dilemma. If they decline, they can be accused of hoarding knowledge and thus of preventing a potential Integrator from fitting these shards of learning back into their original wholeness. Yet if the pagan scientists are granted access to the Memorabilia, they may develop science for destructive, rather than redemptive purposes. (33)

Dom Paulo is plagued by a line of an ancient comedy: “Forth come the banners of the King of Hell” (156); an interesting memory and foreshadowing, given the symbolic linkage of nuclear weaponry and Hell by the fact that the atom bomb is referred to as “Lucifer.” However, despite their unease the monks are ultimately democratic, believing that their knowledge should be shared and put to use. Again, Strada argues, “the blind faith of his [Leibowitz’s] monastic order is a faith in science, which ironically comes full circle and is equated with the devil, as manifested in nuclear weaponry, or “Lucifer” (185). We can see the beginnings of this association through Dom Paulo’s hesitance to welcome Thon Taddeo into the monastery.

What is it about Thon Taddeo that elicits such concern? From the moment we meet him his hubris is evident; he has little regard or respect for past historians, not believing their accounts of the “European-American culture” (Miller 128), and disdains the state of present humans, asking Marcus Apollo “can you bring yourself to believe that that brute is the lineal descendent of men who supposedly invented machines that flew, who travelled to the moon, harnessed the forces of Nature...” (Miller 128). Thon Taddeo’s admiration of the ability to harness nature is also troubling. While in Miller’s novel these instrumentalist attitudes are directly linked to the development of nuclear weapons, we can also see how such attitudes lead to problematic relationships with the environment, and could have resulted in similar circumstances to today’s climate crisis were they not interrupted by a nuclear apocalypse.

At Thon Taddeo’s collegium, interest in natural science is increasing; more students are exhibiting a “healthy hankering to pry open Nature’s private files” (Miller 212), such that “the mastery of Man over the Earth shall be renewed” (Miller 214). Ursula Heise emphasizes the problematic tendency of modernity to presume “to know the natural world scientifically, to manipulate it technologically and exploit it economically, and thereby ultimately to create a human sphere apart from it in a historical process that is usually labeled ‘progress’” (507). We witness these effects in the drive for ‘progress’ in *A Canticle for Leibowitz*. Despite the advances in science and technology achieved in the novel, Miller leaves room to question the “presumption” of human knowledge through the inscrutability of the Memorabilia, and the fact that even the greatest scientific advances can be nothing more than re-discoveries. The preservation of knowledge, while a religious calling, is also made a mockery of in *Canticle*, as none of the Brothers in the order are able to determine which knowledge is worth saving; as the “gifted and Venerable Boedullus once remarked...about half of it should be called the

Inscrutabilia” (Miller 155). Regardless, “it mattered not at all to them that the knowledge they saved was useless, that much of it was not really knowledge now” (Miller 66); the monks preserve knowledge for knowledge’s sake, rather than the more ominous pursuit of knowledge undertaken by the secular scholars. Furthermore, despite their pursuit, neither the secular nor monastic scholars can be more than “recoverer[s] of lost works” (Miller 209). The foolishness of human hubris and the presumption to ‘know’ nature in *Canticle* defamiliarizes our own quests for knowledge and progress, suggesting the limited scope of our understanding even today.

Even though the monks are initially the voice of reason and restraint, as evidenced by their reluctant relationship with Thon Taddeo, I am uncomfortable arguing that Miller suggests that they are the model we should follow, as even their understanding of nature is troubling. Although initially there is resistance to the idea of making the “Lord move over to make room for progress,” (Miller 152) as the novel progresses, the monks seem to become the very thing they originally stood against. Dom Paulo asks of Taddeo: ““You promise to begin restoring Man’s control over Nature. But who will govern the use of the power to control natural forces...Mankind will profit, you say. By whose sufferance?”” (Miller 224). Yet in the third and final section of the novel, “*Fiat Voluntas Tua*” it is clear that the monks have not taken on this governing role, and behave much like the secular scientists. Despite the poverty and poor living conditions of the abbey’s neighbours, rather than abiding by vows of charity and poverty the abbey has expanded with modern additions of aluminum and glass. These new additions are home to various laboratories, where the monks continue their scholarly work by, among other things, monitoring the atmospheric levels of nuclear fallout. Furthermore, it seems that the monks have adopted an attitude similar to the secular scholars in their new modern accommodations; “in the new aluminum and glass buildings [Brother Joshua] was a technician at

a workbench where events were only phenomena to be observed with regard for their *How*, not questioning their *Why*” (Miller 263).

Rather than governing secular science as Dom Paulo suggests is needed in “*Fiat Lux*”, the monks have adopted a similar attitude to that of the government, which they condemn throughout *Fiat Voluntas Tua*. Abbot Zerchi condemns the lack of governance of atomic weaponry, saying, “The very *existence* of the Radiation Disaster Act, and like laws in other countries, is the plainest possible evidence that governments were *fully* aware of the consequences of another war, but instead of trying to make the crime impossible, they tried to provide in advance for the consequences of the crime” (Miller 295, emphasis original). However, the same can be said for the monks, who, despite their unease about sharing their knowledge do so, believing that “more communication, not less, was probably the best therapy for easing any tension” (Miller 200). Recognizing the nature of the threat, they do little to minimize it, and instead form a contingency plan like the government’s. When it becomes clear that the threat of nuclear war is imminent, the monks enact “*Quo peregrinatur grex*,” a plan originally intended to send priests to the colonized star Alpha Centauri but which is repurposed as an emergency plan “for perpetuating the Church on the colony planets if the worst came to pass on Earth” (268).

Rather than attempting to prevent a nuclear apocalypse, the monks have also prepared for one, and then, like they critique Thon Taddeo of doing, attempt to eschew their complicity in the matter when confronted with the human impacts of the nuclear holocaust. Urging a young mother and her dying child to offer their suffering to Heaven, rather than go to a “mercy camp” for voluntary euthanasia, Zerchi claims, “Nature imposes nothing on you that Nature doesn’t prepare you to bear” (Miller 317), ignoring the fact that Nature has nothing to do with the nuclear apocalypse, and thus that the suffering imposed on humanity and the earth is in fact,

quite unnatural.

Although Miller's *A Canticle for Leibowitz* has little to do with climate change as we currently conceptualize it, there are many takeaways from the novel that are applicable in a modern context, and that later authors develop further in regards to the climate crisis. The predominant issues in *A Canticle for Leibowitz* are questions about human nature and responsibility, themes that persist in later dystopian novels and climate fiction. Miller is pessimistic about human nature; he presents humanity as driven by hubris and greed, always striving for a more perfect world, and yet failing to learn from the mistakes of the past. This raises interesting questions about education and the preservation of knowledge; if humanity is unable to learn from past mistakes, what is the value of the work of the monks? Miller gives us no answers. Unlike in modern climate fiction, *A Canticle for Leibowitz* does little in the way of offering readers examples of how to behave. Rather, Miller is ambiguous. Despite professing the need for an ethical way to practice science, the monks ultimately capitulate to the allure of modern science and technology; by the end of the novel they are practically undecipherable from the secular scholars. This theme is picked up in *The Drowned World* by J. G. Ballard, who is also concerned with the ethics of scientific practice.

The Drowned World

Published in 1962, thirteen years before “global warming” was a popular concept, J. G. Ballard's *The Drowned World* uncannily predicts the effects of global warming, imagining a world dominated by Triassic lifeforms and subtropical heat. Set in the year 2145 the novel takes place in a world where solar radiation has caused the ice-caps to melt and sea levels to rise. An expedition, led by Dr. Kerans and his associate Dr. Bodkin, seeks to map the unknown biological

diversity flourishing in the jungles of London. However, the biologists ultimately abandon their task, and must contend with Colonel Riggs and the piratical Strangman as their ideologies clash in the jungle environment.

Jim Clarke attributes the later development of climate fiction to Ballard's early novels, which he claims are foundational to the genre, as Ballard takes a "climatological approach to apocalyptic dystopia" (Clarke 7). While this may be true in several ways, such as Ballard's distrust of science's ability to address the problem of global climate change, it is reductive to think of *The Drowned World* simply as an apocalyptic dystopia with the environment as a key feature. As apocalyptic it may seem, *The Drowned World* is ontologically ambiguous, and raises challenging questions about generic expectations and conventions of utopian and dystopian fiction. If we are to take Presley's definition of ecotopian fiction as true, then the genre deals with "visions of a negative, dystopian future that connects with a range of environmental issues" (11). In order to understand this definition, we have to understand what is meant by dystopian; this is where classification of *The Drowned World* becomes as ambiguous as the time zones in Ballard's novel. Dystopian literature is often taken as a vehicle for challenging modern contexts, or as forewarning about the dangers of current trajectories; if we take its definition to involve some sort of call to action or inspiration, *The Drowned World* is inherently problematic as an ecocritical dystopia; not even deep ecologists would go so far as to suggest self-immolation in order to understand our connection with our environments. On the other hand, if we adhere to Keith Booker's *Theory and Research Guide to dystopian literature*, dystopian literature critiques social conditions or political systems, either through the "critical examination of the utopian premises upon which those conditions and systems are based or through the imaginative extension of those conditions and systems into different contexts that more clearly reveal their

flaws and contradictions” (3). Given this definition, Ballard’s novel can be read as dystopian due to its various critiques about the human treatment of the natural world.

Ballard’s work is typically considered New Wave science fiction, a reactionary genre, which pushes back against the conventions of hard science fiction, and asks readers to interpret events in a new light. Whereas hard SF emphasizes the desirability of technological development and exploration, new wave SF is “profoundly hostile to technocracy, militarism, and imperialism” (Franklin 342); this hostility is recognizable in *The Drowned World*, and it is on this basis that we can read Ballard’s novel as dystopian. Contrary to expectations given its Triassic conditions, the climate, in Ballard’s eyes is not the novel’s dystopian element; rather, it is the capitalistic, instrumentalist approaches to scientific discovery in the 20th century, as well as despotic attempts to impose order on nature that are the dystopian elements. We can read similar critiques in later ecotopian fiction, such the novels by Margaret Atwood and Paolo Bacigalupi analyzed in the third chapter. Rather than depicting the changing climate as an antagonistic force, Ballard favours an acceptance of and respect for the natural world.

While in *A Canticle for Leibowitz* (1959), Walter Miller begins to question the ethics of scientific discovery, these questions are further advanced by later New Wave science fiction, leading to the development of a subset of new wave eco-disaster stories in the 1960s and 70s, within which we can classify *The Drowned World*. As Rob Latham explains, “The New Wave generally adopted an anti-technocratic bent that put it at odds with the technophilic optimism of Campbellian hard SF, openly questioning if not the core values of scientific inquiry, then the larger social processes to which they had been conjoined in the service of state and corporate power” (107). In this novel, Ballard challenges utopian visions of techno-scientific progress. It is significant that the protagonists-- biologists working on a governmental research station--

ultimately abandon their research crew in favour of a life (or death) in the lagoon. Throughout the novel Ballard makes explicit comments about both the futility, and the ultimate failure of science; while the biologists can map the lagoons and emergent species, there is ultimately nothing they can do to prevent the changes, or even to reclaim the cities; as Colonel Riggs notes, “we should have got out years ago. All this detailed mapping of harbours for use in some hypothetical future is absurd. Even if the solar flares subside it will be ten years before there’s any serious attempt to reoccupy the cities” (Ballard 27). The absurdity of scientifically mapping the new landscape is reinforced when Kerans and Bodkin sink the testing station. Having decided to stay behind, it is as though the biologists feel that their work should not leave the lagoon either. Watching the station sink, Kerans muses that the floating papers and charts were “a perfect, almost vaudevillian comment on the biophysical mechanisms they sought to describe” (Ballard 94).

Unlike in most hard SF narratives, the day is not saved by the scientists in *The Drowned World*. We can read this reactionary position in the intertextuality of the last chapters. As McCarthy demonstrates, Kerans’ rescue by the fortuitous arrival of Colonel Riggs echoes the ending of William Golding’s *Lord of the Flies*, in which “Ralph...is saved from certain death by the naval party that comes to rescue the boys” (McCarthy 303). McCarthy emphasizes the irony and reactionary nature of this allusion, as “Golding regards civilization as basically a positive force that holds our savage impulses in check, whereas Ballard treats civilization, ultimately, as a doomed revolt against nature that we must eventually abandon” (303). While the crew arrives in the nick of time to save Kerans from Strangman, Kerans ultimately rejects them once again. This move echoes Hardman’s earlier escape, and Bodkin’s attempt to destroy the barrage. Where Bodkin failed, Kerans succeeds: he blows up the barrage, re-floods the lagoon and prevents the

reclamation of both the testing station and the city, before heading on his final southward odyssey. While we may not think of Ballard as reacting to climate change in the way that we may with more modern authors, we cannot deny his ecological bent, fostered by the ethos of New Wave SF. In the introduction to a collection of eco-catastrophe stories, *The Ruins of the Earth*, Thomas Disch writes:

The very form of the so-called ‘hard-core’ sf saga, in which a single quasi-technological problem is presented and then solved, encourages [a] peculiar tunnel vision and singleness of focus that is the antithesis of an ‘ecological’ consciousness in which cause-and-effect would be regarded as a web rather than a single-strand chain. (qtd. Latham 110-11)

Such “tunnel vision and singleness of focus” are apparent in both Strangman and Riggs, whose only interests involve dramatically altering the natural landscape of the lagoon, in order to reclaim the city from nature.

Despite his negative portrayals of most humans in his novel, Ballard does not attribute climate change in *The Drowned World* to anthropocentric causes. Rather, global warming occurs in his novel due to “a series of violent and prolonged solar storms lasting several years caused by a sudden instability in the Sun” which “deplete[s] the “ionosphere” and reduces Earth’s protection from solar radiation, in turn resulting in the steady increase of global temperatures (Ballard 33). As Ballard puts it, “mean temperatures rose by a few degrees each year” and “the majority of tropical areas rapidly became uninhabitable” (33). Regardless of the cause of the warming, we can draw parallels between Ballard’s ambiguously dystopian conditions and today’s climate change. While not the primary focus of Ballard’s novel, we are able to discern the fate of humanity in the early chapters, in which we learn that it has been sixty to seventy years since the first climatic upheavals, and in such time earth has seen a massive reduction in

human population; the population is reduced to fewer than five million, who due to the warming are only able to survive in the arctic regions (Ballard 35). This drastic reduction of the human population, and reduced habitable area of Earth are eerily prescient; while today earth's population continues to grow, it is not difficult to imagine a scenario in which many of earth's vulnerable populations are wiped out by climate upheavals.

More important in Ballard's novel than the fate of humanity is the way that nature reclaims the cityscape, subsuming its structure into its Triassic landscape. With increasing temperatures, just as today's climate scientists predict, the polar ice caps melt, reconfiguring the global landscape. As Ballard envisions,

The entrained ice-seas of the Antarctic plateau broke and dissolved, tens of thousands of glaciers around the Arctic circle...poured themselves into the sea, millions of acres of permafrost liquefied into gigantic rivers. Here again the rise of global water-levels would have been little more than a few feet, but the huge discharging channels carried with them billions of tons of topsoil...extending the continental coastlines and damming up the oceans. Their effective spread shrank from two-thirds of the world's area to only slightly more than half (34).

While the oceans shrink, the world is nonetheless drowned as massive lagoons fill the cities, making them unrecognizable and uninhabitable, "hemmed in by enormous dykes and disintegrated by panic and despair, reluctant Venices to their marriage with the sea" (Ballard 32). The changing climate also comes with increasing levels of radioactivity, and thus mutated organisms, which recall earlier life-forms of the Carboniferous and Triassic periods.

Ballard's novel demonstrates attitudes that we could learn from in our age of climate crisis. While on the surface Ballard's novel seems dystopian, he himself does not view it through such a

lens, saying in an interview with James Goddard and David Pringle, “the geophysical changes which take place in *The Drought*, *The Drowned World* and *The Crystal World* are all positive and good changes—they are what the books are about. The changes lead us to our real psychological goals so they are not disaster stories at all” (qtd in Clakre 11). While it is difficult to agree that all of the changes depicted in the novels are positive and good, one can argue that some of the psychological changes they catalyze in the few humans in the novel could benefit today’s world. One could argue that Ballard’s novel takes a deep ecological stance, in the way that it foregrounds the symbiotic relationship between humans and their environment. Doctor Bodkin, in outlining his understanding of archeopsychic time suggests that much of human personality can be attributed to our evolutionary histories, asking Kerans,

How else can you explain the universal but completely groundless hating of the spider...? Or the equally surprising—in view of their comparative rarity—hatred of snakes and reptiles? Simply because we all carry within us a submerged memory of the time when giant spiders were lethal, and when reptiles were the planet’s dominant life form (Ballard 55).

By taking this evolutionary approach, Ballard de-centers the human, and it becomes not only another animal, but a repository for the entire evolutionary history of the earth; as Bodkins elaborates: “Each one of us is as old as the entire biological kingdom, and our bloodstreams are tributaries of the great sea of its total memory” (56). These thoughts are in line with deep ecological thinking, which was originally conceived by Arne Naess in 1972 as a “reorientation of thought that hinged on the bringing to consciousness of the ‘relational, total field-image’ of ‘organisms as knots in the biospherical net or field of intrinsic relations’” (qtd. In Buell 102).

Ontologically speaking, deep ecology can foster a recognition of human interconnectedness

and rootedness in ecosystems, and, as Heise writes, it involves the “realization of a self that encompasses both the individual and the cosmos” (511). We can see all of these features at play in *The Drowned World*. While attitudes are initially anthropocentric, as shown by Bodkins’ claim that “[they’ve] ignored the most important creature on this planet,” in reference to human beings (54), as the novel progresses the attitude of self-as-cosmos develops. This attitude first emerges with the arrival of Stangman; when the newcomer insists that it is impossible for Bodkins, Bea and Kerans to remain in the lagoon due to rising temperatures and the return to Mesozoic conditions, Bodkins replies, “And in so far as we are part of the planet, a piece of the main, we too are returning... Here we are re-assimilating our own biological pasts” (Ballard 108).

This planetary attitude persists throughout the rest of the novel, and is particularly evident through the characters’ reactions to the lagoon. During his dive, Kerans claims that the water of the lagoon “feels like home” (Ballard 123), and when he is drowning, rather than panic as we might expect, Kerans is relaxed, laying back, while the “soothing pressure of the water penetrated his suit so that the barriers between his own private blood-stream and that of the giant amnion seemed no longer to exist” (Ballard 127). While none of the others experience such a complete transformation, we can recognize in both Bodkins and Bea their respect for the lagoon. When Stangman drains the lagoon, Beatrice is shocked by the underlying remains of civilization: “But it’s all so hideous. I can’t believe that anyone ever lived here... Robert, I *need* the lagoon” (Ballard 143, italics original). Bodkins takes these sentiments one step further, attempting to destroy Stangman’s barrage and re-flood the lagoon. The novel ends with Kerans ultimately becoming part of the downed world, as he heads southwards, “following the lagoons... through the increasing rain and heat, attacked by alligators and giant bats, a second Adam searching for the forgotten paradises of the reborn sun” (Ballard 198).

Ballard is certainly not suggesting that his readers should all die in the name of environmental preservation, however *The Drowned World* does suggest that a re-conception of our relationship with the natural world is necessary, particularly during times of climate change. Ballard espouses values similar to those of deep ecology, a decade before the concept was born. He suggests that we must recognize and accept our place in our ecosystems, not as separate from and above them, trying to shape them forcefully to our will, but rather as webs of connections upon which we depend. As Bodkin puts it, we too, are part of the main, and any changes that affect the planet will affect us as well. This knowledge is particularly important during the climate crisis; if we fail to recognize how environmental changes will also affect humans, we may be significantly less likely to act in order to prevent such changes.

Ballard portrays the development of such attitudes as being in direct conflict with science, as in order for these ideas to germinate both Kerans and Bodkin must abandon Colonel Riggs and the research station. Like Miller's *A Canticle for Leibowitz* and later climate fiction like Atwood's *MaddAddam* trilogy, Ballard urges us to think about how science is used by society. In *The Drowned World* it is portrayed as futile; due to continuing sea-level rise, the work of the biologists "has been a total waste" (Ballard 25). Their work is premised on "some hypothetical future" which may never arrive (Ballard 27); if the effects of climate change are too severe, it won't matter if they have a record of new species if humanity fails to survive. It seems Ballard is implicitly critiquing modern institutions of science; rather than working on technologies that may allow us to survive in a future greatly affected by climate change, Ballard seems to be suggesting the need for science to address the root causes of the problem.

The Word for World is Forest

Whereas *The Drowned World* foregrounds the transformation of characters as they recognize their interconnectedness with their environments, Ursula Le Guin's *The Word for World is Forest* demonstrates the effects of disrupting the bond between a people and their ecosystem. In *TWFRF*, we witness the invasion of a peaceful world, Athshe by the "yumens," who colonize the planet and immediately begin altering its ecology—clear cutting the forest to send the trees back to earth, where "clean sawn plans" are "more prized than gold" (Le Guin 16). However, unlike Earth where lumber is only valued commercially, on Athshe the forest is of tremendous cultural significance and value. In fact, the planet's name, Athshe, means both the Forest and the World (Le Guin 105). Its inhabitants live in the forest, and are part of its ecosystem, such that when violence is introduced to the planet in the form of logging, it is also introduced into their previously peaceful society.

The Word for World is Forest was published in 1972, although it was written in 1969, as a dystopian reflection upon the Vietnam War. Le Guin was against the war in Vietnam, and her name appeared in protest lists in many science fiction magazines in the late 1960s (Franklin 351). This outlook led to the writing of *TWFWIF* as a way to defamiliarize (although very thinly veiled) the militaristic imperialism of the Americans in Vietnam. This novel, part of Le Guin's *Hainish Cycle*, outlines the encounter between two species of human: the Athsheans, and the Terrans. In this cycle, humans exist throughout the solar system as a result of Hain colonies that were established before interstellar communication ceased. Thus everyone in the solar system is technically human, despite various physiological differences between populations.

Covered in a fine green fur, the Athsheans are human, although they are not recognized as such by most of the colonizers of their planet, defamiliarizing our ideas of human nature. The

Athsheans, or “creechies” as they are called by their less respectful colonizers, behave in a more humanly decent way, while the “humans” or “yumens” as the Athsheans call them, act like monsters. As Lyubov, a colonizing scientist puts it:

Despite their physical differences, they recognized us as members of their species, as men. However, we have not responded as members of their species should respond. We have ignored the responses, the rights and obligations, of non-violence. We have killed, raped, dispersed, and enslaved the native humans, destroyed their communities, and cut down their forests. It wouldn't be surprising if they'd decided that we were not human. (Le Guin 75)

Through the similarities between the Terrans the Americans in Vietnam, Le Guin achieves what Patrick Murphy calls the “cognitive function” of SF, which “helps us know ourselves and our existential situation” encouraging “discomfiting reading and social action through implicitly or explicitly commenting on the readers' contemporary predicament” (26).

Le Guin's critique of ecological imperialism remains valid today and can also be applied to discussions of climate change and global warming, demonstrating how although historical, dystopian fiction can also be read in modern contexts. Its meaning can vary based on the contexts of readers and the period in which they come to the text; for example, on my first reading, I read *The Word for World is Forest* through an ecological lens, and only considered other contexts after seeing the publication date. As Ian Watson points out, “the obvious Vietnam analogy should not blind one to other relevant contemporary analogies—the genocide of Guyaki Indians of Paraguay, or the genocide and deforestation along the Trans-Amazon Highway in Brazil, or even the general destruction of rain-forest habitats from Indonesia to Costa Rica” (231). The novel can be made to speak against almost any example of technocracy, militarism, imperialism, or ecological devastation one can think of. The mindsets demonstrated by the

Terrans are similar to those of Riggs and Strangman in Ballard's *The Drowned World*, or even the secular scientists in *A Canticle for Leibowitz*. They are rapacious, with little regard for the existing humans or the world, and most of the scientists are only concerned with the value of the planet for Terran colonization. These attitudes are evident from the first pages of the novel, focalized through Captain Davidson. Davidson speaks in terms of "taming" New Tahiti (the Terran name for Athshe) (Le Guin 10). He believes that "New Tahiti, was literally made for men. Cleaned up and cleaned out the dark forests cut down for open fields of grain, the primeval murk and savagery and ignorance wiped out, it would be a paradise, a real Eden. A better world than worn-out Earth. And it would be his world" (12).

The reason the Terrans must colonize Athshe is due to the destruction of their own home planet. Earth is a cement desert, where trees no longer grow. "Most Terrans on Terra...had never walked among wild trees at all, never seen a wood larger than a city block" (Le Guin). Rats are the only wild animals that remain on the planet, with robodeer filling in the function of their live counterparts in the High Rockies and Himalaya Parks (Le Guin 14). While Le Guin never explicitly comments on the practices that have led to such planetary devastation, we can infer that the Terrans practice equally ecologically problematic agricultural methods on their home planet as the ones they are trying to introduce on Athshe. Davidson laments the fact that you must leave trees standing on farm land, in order to prevent soil erosion, believing that this practice could be avoided if land were managed "really scientifically" (Le Guin 10). We can infer that such damaging practices have been used on Terra, as "it wasn't like that in Ohio; if you wanted corn you grew corn, and no space wasted on trees and stuff" (Le Guin 10). We can draw parallels between these destructive practices and many of the practices that take place today.

Although not written with this context in mind, it is easy to read LeGuin's novel as a

commentary on destructive environmental practices, and the damage they inflict on human populations. Unlike in *TWTFWF* however, we only have a single planet with conditions hospitable to life. We cannot simply consume all of earth's resources and move on to the next resource rich planet, as the Terrans do in LeGuin's novel. Furthermore, her novel can be seen as a commentary on how the effects of climate change are rarely felt by those responsible for the environmental degradation, and tend to disproportionately affect the poor and those in the developing world, a theme that remains persistent in more modern cli-fi.

Chapter 3

As previously stated, “global warming” entered the lexicon in 1975, and the concept quickly gained popularity. The 1970s saw the rise of the environmental movement, with popular works such as Rachel Carson’s *Silent Spring*, Paul Elrich’s *The Population Bomb* and Gary Snyder’s “Four Changes.” With increasing awareness and anxiety about global warming and environmental issues came the rise of a new genre of science fiction: climate fiction. Given the role of dystopian literature, of showcasing societal fears and acting as a warning to readers, we should expect that dystopian fiction written after 1975 would emphasize environmental concerns. Whitley, Chiang and Einsiedel track the development of cli-fi in their paper “Climate Change Imaginaries?” and note a discussion forum in the *New York Times*’ online platform for discussing whether fiction will influence how we react to climate change (29). According to the authors, “some [see fiction] as a catalyst to reflect our anxieties about climate change (Telotte), while others [see] fiction as a way to make the issue more palatable to the general public in order to motivate them to take action (Cullen) (qtd. Whiteley et al. 29). This chapter will investigate how recent dystopian fiction engages with environmental issues by considering Margaret Atwood’s MaddAddam trilogy, and two novels by Paolo Bacigalupi: *The Windup Girl* and *The Water Knife*. Both sets of novels meld traditionally dystopian elements with those of climate fiction; such a marriage of genres, Stapleton suggests, demonstrates how “a collapsing global environment [can be] exploited by dominant corporations through biopolitical controls” (25-6). Does this marriage of genres simply reflect our anxieties, or can it motivate readers to take action against climate change?

Margaret Atwood

If Stapleton's assertion that dystopian novels dramatize the "fears we have about our future" (20), Margaret Atwood's Maddaddam trilogy (2003-2013) paints a grim collage of many anxieties. Her trilogy is not defined by a single dystopian element as many older dystopian texts are (such as imperialism or atomic war), but rather by many amorphous forces working in concert to contribute to a world rife with environmental degradation, the abuse of women, the mistreatment of the poor, and corporations with unlimited control. Each novel in the trilogy emphasizes one such dystopian element, as the focalization alternates between characters and between periods before and after the apocalypse, known in the trilogy as "the waterless flood."

The first novel in the trilogy, *Oryx and Crake*, is a last-man narrative following Snowman (known as Jimmy before the apocalyptic plague) as he struggles to survive in a world where he believes himself to be the only human. He retraces the past (both in his memory and in a journey to the Compound where he once lived) in order piece together his history for himself and for readers, while mourning the loss of his friend Crake and his lover Oryx. Jimmy must also care for a genetically engineered pseudo-human species created by Crake, once a powerful scientist who designed this species before genetically engineering a pandemic to wipe out human kind.

The Year of the Flood is alternately focalized through Toby and Ren, who are God's Gardeners when the novel begins, but who ultimately survive the pandemic on their own—Toby barricaded in the AnooYoo Spa where she worked, and Ren in the high-end sex club Scales and Tails where she was locked in an isolation room during the outbreak. Like *Oryx and Crake*, *The Year of the Flood* alternates between pre- and post-apocalypse focalization, demonstrating the rule of corrupt corporations before the apocalypse and showing the struggle to survive after the 'waterless flood.' However, whereas *Oryx and Crake* is set in the plush Compounds, *The Year of*

the Flood demonstrates the conditions in the pleeblands, where the poorer part of society lives.

The trilogy comes together in *MaddAddam*, in which the surviving God's Gardeners (including Toby and Ren, as well as Zeb, another former God's Gardener) have formed a community along with several scientists who were employed by Crake in his Paradise Project. The genetically engineered Crakers are also part of this novel, and the humans must learn to survive by cooperating with both the genetically engineered humanoids, as well as the pigoons (genetically engineered pigs with near human intelligence). *MaddAddam* is a history of humanity's past, recounted through the stories Toby tells the Crakers, and unlike the other two novels in the trilogy suggests hope for the future.

The fact that the trilogy employs numerous dystopian elements is to be expected; as Chris Berg argues, there are many similarities between environmental and traditional dystopian novels; "even if environmental dystopias appear to reflect a new cultural fear, they also eventually reveal the more 'traditional' dystopian fear of a 'monolithic organization exerting super normal controls over an unwilling or ignorant population'" (qtd. In Stapleton 21). This is true of Atwood's trilogy; climate change is not emphasized in any of the novels in the series as the primary dystopian element (perhaps with the exception of some of the God's Gardener's chapters in *The Year of the Flood*); rather, it is an ever-present backdrop, discerned by readers through throwaway comments made by characters. However, unlike her characters, Atwood herself is keenly aware of climate change, as shown through some of her other writings (fiction, poetry, and non-fiction alike), and her involvement with environmental organizations like A Rocha. Given Atwood's environmentalism, it seems strange that climate change does not feature more prominently in this trilogy.

I argue that Atwood deliberately keeps climate change as a marginal issue in the

MaddAddam trilogy—*Oryx and Crake* in particular— as a commentary on how we treat climate change in the twenty-first century, even as we approach peak oil and encounter more and more frequent catastrophic climate events. Atwood uses her trilogy to comment explicitly on many elements of our contemporary predicament, such as genetic engineering, the rise of multinational corporations, and the mistreatment of women. However, her commentary on climate change is more implicit. Atwood is highly satirical, and her satire not only critiques multinational corporations and ecological imperialism, but also points to the failures of corporate greening strategies and other soft ecological approaches. In an essay written by Atwood entitled “It’s Not Climate Change, It’s Everything Change,” she writes to climate change deniers:

I myself would like to disbelieve in gravitational forces, because then I could fly, and also in viruses, because then I would never get colds. Makes sense: you can’t see viruses or gravity, and seeing is believing, and when you’ve got your head stuck in the sand you can’t see a thing, right?...What a practical idea for solving pesky problems: let’s not talk about it, and maybe it will go away (n.p.).

This satiric tone is reflected in her trilogy, and so is this attitude of deliberate ignorance; as climate change is largely ignored in her novels Atwood reveals the absurdity of our treatment of the environment in the twenty-first century. As Jimmy thinks at one point, “there had been something willed about it though, his ignorance. Or not willed, exactly: structured” (*Oryx* 184). Jimmy’s ignorance is about Crake, not about climate change; however, we could argue that many of the characters in the trilogy, particularly those who work for the Corporations, are willfully ignorant about climate change.

The novels in Atwood’s trilogy alternate between the post-apocalyptic world following the “waterless flood” — biohacker and genetic engineer Crake’s vision of a reset for the human

race— and the pre-flood world, governed by neoliberal corporations and mad scientists, fraught with climate change and social inequality. As Stapleton argues, “The MaddAddam trilogy reflects particular fears of the early twenty-first century, namely the growing power that multinational corporations wield in our everyday lives, the disintegration of regulatory protection by the state, and severe environmental degradation due to climate change” (23). While Atwood’s trilogy can be classified as post-apocalyptic fiction, through Jimmy, Ren, Toby, and Zeb’s flashbacks (*Oryx and Crake*, *Year of the Flood*, and *Maddaddam* respectively), she demonstrates how the pre-collapse world is just as dystopian as its post-collapse counterpart. Calina Ciobanu notes that “while in the series the proximate cause of the apocalypse is the mad-scientist figure Crake—who has engineered both the pandemic designed to eradicate humankind and the new-and-improved Craker species meant to take its place—it is clear that even before the outbreak, the clock on the Anthropocene has effectively run out” (153). Even without the bioengineered pandemic the world in Atwood’s novels would reach a similar outcome in short order, likely through a longer and more drawn-out man-made apocalypse—namely, global climate change. However, like the crisis we find ourselves in today, that crisis would not have been orchestrated by a single person, but would have been the result of 150 years of environmentally and socially destructive practices.

The trilogy gives us very little information about the societal structure, which Atwood argues makes the novel not “classically dystopian” (“In context” 517). However, we can infer the society’s lack of governance and both the rampant corruption of the compounds and the economy, which are both tied to the radical commodification of science. The compounds are inhabited by the top scientists, who are protected by private security forces that protect against ‘brain snatching’ (the kidnapping of employees to steal company secrets). We learn about the

need for intense security early in *Oryx and Crake*, and are introduced to the security company CorpSeCorps (Corporation Security Corps), who Jimmy’s father refers to as “our people” (Atwood 27), emphasizing the links between the compounds and the security forces. We also learn of the dangers of “the other side, or the other sides: it wasn’t just one other side you had to watch out for. Other companies, other countries, various factions and plots” (*Oryx* 27), who are not above kidnapping and worse to steal company secrets, or to prevent the corruption of the companies from becoming public knowledge. The lengths to which Compounds are willing to go to protect their secrets is demonstrated when Crake’s father is pushed from an overpass to prevent him from whistleblowing after discovering HealthWyzer’s corruption of the Lauderdale Paradox.¹ The Compound compromises public health for private wealth by creating new diseases while simultaneously developing antidotes and holding them in reserve in order to capitalize on “the economics of scarcity, so they’re guaranteed high profits” (*Oryx* 211).

Where *Oryx and Crake* primarily emphasizes the corruption in the compounds, *The Year of the Flood* demonstrates how corruption is also rampant in the pleeblands, giving us a greater view of the dystopian society of the pre-flood world. We learn much more about the CorpSeCorps in this second novel; they have taken the role of police, and the private security company ruthlessly enforces the wishes of the Compounds. Toby outlines their development, noting: “the CorpSeCorps were consolidating their power. They’d started as a private security firm for the Corporations, but they’d taken over when the local police forces collapsed for lack of funding, and people liked that at first because the Corporations paid, but now the

¹ The Lauderdale Paradox is associated with the ideas of James Maitland, “who observed in 1804 that private riches (exchange values) could be expanded by destroying public wealth (use values)—that is, by generating scarcity in what was formerly abundant. This meant that individual riches could be augmented by landowners monopolizing the water of wells and charging a price for what had previously been free —or by burning crops (the produce of the earth) to generate scarcity and thus exchange value” (Foster, 10).

CorpSeCorps were sending their tentacles everywhere” (*Flood* 25).

The Year of the Flood demonstrates exactly how “everywhere” the Corps’ tentacles reach and how their lack of oversight has negative impacts on civilians: “Bystanders got killed a lot in spraygun attacks. It couldn’t be helped, said the CorpSeCorps. It was in the interests of public order” (*Flood* 212). Referring to the murder of Crake’s father, Zeb tells Toby that “suicide was the rumor” but that the Gardeners call such deaths “Corpicide” because “if you’re Corp and you do something they don’t like, you’re dead. It’s like you shot yourself” (*Flood* 244). The CorpSeCorps’ reach extends beyond the murder of individual dissidents; it is so far spread that democracy no longer exists; protests are not only ignored, but are seen as threats. The Corps have set up their own secret-service units, and “seized control of the artillery... any kind of public action involving crowds and sign-waving... would be shot off at the knees...” (*Maddaddam* 242).

In addition to controlling the security forces, the corporations also control the flow of information through the media. Referring to her father’s kidnapping and likely murder by a rival Corp, Ren is told that HealthWyzer (the Corporation that employed him) “had done a cost-benefit analysis...and they’d decided the disease germs and formulas were worth more to them than Frank was” and “as for the adverse publicity, they could squelch it at source, since the media Corps controlled what was news and what wasn’t” (*Flood* 293). Adam gives similar reasoning when arguing against going public with the information that HealthWyzer is “using their vitamin supplement pills and over-the-counter painkillers vectors for diseases—ones for which they control the treatments” (*Maddaddam* 254). The MaddAddamites must be careful when going public with such news, because “[They’d] only sound paranoid, and after that [they] all would have unfortunate accidents” as “the press is Corps-controlled” (*MaddAddam* 255).

The power the Corporations exert over the news is also evident in Ren’s account of the

coverage of the JUVE virus. Initially the virus is described as a “minor epidemic” (*Flood* 279), but it quickly becomes an “emergency” (*Flood* 282); this is particularly serious as “ordinarily the Corps would have called for lies and cover-ups, and [the public would] hear something like the real story only in rumors” (*Flood* 283). The lack of reliable news organizations reinforces the dystopian nature of Atwood’s imagined society; lacking a true understanding of the events that shape their lives not only puts her characters’ lives at risk, but also prevents them from understanding and potentially protesting the many issues plaguing their society.

Critiques of the societal structure of the pre-flood world are explicit throughout the trilogy. However, as mentioned above, critiques of environmental practices are more implicit in the series. Such critiques can be seen through the organizations and groups that Atwood chooses to foreground in the series, such as Bearlift, the Church of Petroleum, and the God’s Gardeners. The God’s Gardeners in *Year of the Flood* and Bearlift in *MaddAddam* both offer potential solutions to or ways of addressing climate change; Atwood explores the potential of each; however she ultimately suggests that neither approach is suitable or appropriate for addressing the problem in a meaningful way. The inclusion of both organizations in the trilogy suggests to readers the need for organized action to mitigate climate change, and may urge them to develop or become involved with truly impactful organizations.

Bearlift is a scam that “live[s] off the good intentions of city types with disposable emotions who liked to think they were saving something” (*MaddAddam* 59). It is premised on the fact that “the polar bears are starving because the ice is almost gone and they can’t catch seals anymore” (*MaddAddam* 59). To help the starving bears loads of human garbage are helicoptered to the far north to feed them until they can “adapt” (*MaddAddam* 59). If the problematic ecological repercussions of such a solution aren’t clear enough, there is also the fact that “adapt”

is “another way of saying *tough luck*. To people you weren’t going to help” (*MaddAddam* 59). Bearlift offers only a very temporary solution to the endangered status of polar bears, and it is also likely that it could only have been in operation for a short period, due to the massive fuel requirements. As Toby puts it, “this was before the oil shortage really kicked in?...And the carbon garboil business took off. Otherwise, they’d never have let you waste such valuable primary material on bears” (*MaddAddam*58). Such a ‘solution’ is ultimately more of a PR play, doing nothing to mitigate the effects of climate change, while contributing to GHG emissions through the transportation of garbage.

The only other ecological organization in the trilogy is the God’s Gardeners, who appear primarily in *The Year of the Flood*. Atwood presents the God’s Gardeners in a more positive light, which is not surprising given her involvement with the Christian environmental organization, A Rocha. While “some readers with past experience of Atwood see the God’s Gardeners, with their childlike hymns, their vegetarian diet, their recycled crafts and their earnestness, as merely ‘ridiculous’...there is surely more to them than that” (Bowen 695). I would argue that Toby’s reflections (initially a skeptic and non-believer) about the Gardeners after the waterless flood speak to their presence in the trilogy as more than ‘ridiculous.’ Toby is sometimes so unexpectedly homesick for the garden that she is bowled over (*MaddAddam* 209), and continues many of their practices on her own both on the AnooYoo spa rooftop garden, and once she has joined the MaddAddamties. Northover even attributes Toby’s survival of the “waterless flood” to “both the skills and theology she has acquired as a God’s Gardener” (130).

Unlike the rest of the society in the trilogy, the God’s Gardeners recognize the damage that humans have inflicted on the earth. In the sermon for the Feast of Adam and All Primates, Adam One proclaims: “Ours is a fall into greed: why do we think that everything on Earth belongs to

us? ... We have betrayed the trust of the Animals, and defiled our sacred task of stewardship” (*Flood* 53). Stewardship is a key word here, as it suggests that the environment is inherently worth caring for. Such an attitude contrasts with religious outlooks in earlier dystopian novels, wherein the human relationship with the earth is one of “dominion.” An attitude of stewardship is reflected by the practices of the Gardeners; they are vegetarians and relocate ‘pests’ from their rooftop garden, rather than killing them. As Gary Snyder recommends in “Four Changes,” the Gardeners “act as gentle steward[s] of the earth’s community of being” (n.p.). Atwood writes in an article for the Christian journal *Sojourners*, “if the physical world is going to remain possible for human life, religious movements of many kinds will be an important element. We don’t save what we don’t love, and we don’t make sacrifices unless ‘called’” (qtd. In Bowen 701). This attitude is reflected in the trilogy, as the Gardeners are the only group who truly seem to love the environment.

However, despite her hopeful outlook on the role of religion, Atwood’s novels still seem to suggest that even this deep ecological approach is not sufficient in this time of crisis, as demonstrated by the splintering of the group into a more radical subgroup, MaddAddam. Furthermore, *MaddAddam*, unlike *The Year of the Flood*, has a more cynical outlook on religion. It is in this book that we get a good look at the Church of PetrOleum, affiliated with the PetroBaptists introduced in *The Year of the Flood*. Unlike the Gardeners, the Church of PetrOleum is a for profit corporation; religion is an easy way to rake in the cash if “you had a facility for ranting and bullying, plus golden-tongued whip-‘em-up preaching, and you lacked some other grey-area but highly marketable skill” (*Madd* 111). The Church rises to popularity around the time oil becomes scarce and the plebs become more desperate. Perhaps accordingly, the Church is “death on ecofreaks” (*MaddAddam* 182), going to great lengths to warn their

congregation about the threats of renewable energy and ecological responsibility, lest they divest from fossil fuels.

We also learn some troubling information about the Gardeners in *MaddAddam*. While the God's Gardeners suggest to readers a more responsible way of living on the earth, we also learn that they may have predicted the coming of the 'waterless flood,' due to their own involvement with Crake. After smuggling certain "hot bioforms" out of a Compound, Toby's mentor Pillar passes the disease vectors along to Crake, knowing both how dangerous they are and what Crake is likely to do with them. In *The Year of the Flood*, we also learn about MaddAddam, a splinter cell of the Gardeners, who felt that more extreme measures were needed than the Gardeners were willing to undertake. Working in concert with biologists who had escaped from the corporations, they do "bioform resistance" with the belief that "if you could destroy the infrastructure... then the planet could repair itself" (*Flood* 333). But even MaddAddam is not infallible, as they get "snatched" by Crake, forcing them to work on his Paradise project, which ultimately results in the near-extinction of the human species. Thus, while in some of the trilogy Atwood seems to present religion as a good way forward during the ecological crisis, she leaves enough ambiguity to cast doubts in readers' minds about whether such a passive approach is truly adequate.

As mentioned previously, Atwood's trilogy is predominantly a social critique. However, as Whiteley, Chiang, and Einsiedel note, "situating the climate change problem within the social... can elucidate the complexities of the problem in ways far removed from temperature charts and other scientific ways of understanding climate change" (34). By demonstrating the social impacts of climate change, dystopian novels like Atwood's (and Bacigalupi's, examined next) may demonstrate to readers why climate change should matter to them. Both authors demonstrate how issues of social justice and climate change are intertwined, with the effects of

global climate change disproportionately impacting the poor (Goldenburg n.p.).

Atwood's novels demonstrate how inequities are reinforced and increased by global climate change through Oryx, who is sold into the sex trade before becoming one of Crake's employees at Paradise, and lovers to both Jimmy and Crake. Much of Oryx's history is told through Jimmy's perspective, and it is unclear whether Oryx is truly the girl in Jimmy's narrative of her ("Which of these [Oryxes] will it be, and how can he ever be sure there's a line connecting the first to the last? Was there only one Oryx, or was she legion?" (*Oryx* 308)). The unreliable narration of Oryx's past seems deliberate on Atwood's part, if only to emphasize the ubiquity of her story. Her history is not unique, but rather is symptomatic of global inequities which become increasingly dystopian through the effects of climate change.

Oryx's father dies when she is a child, and she is sold by her mother because "everyone in the village knew [that]...if there was no man to work in the fields or in the rice paddies, then the raw materials of life had to come from somewhere else" (*Oryx* 116). Oryx and other village children are sold to a man who frequently came to the village, and "wasn't regarded as a criminal of any sort, but as an honourable businessman who didn't cheat...and who paid in cash...He was the villagers' bank, their insurance policy..." (*Oryx* 117-18). According to Oryx, by the time she was sold the man was needed more frequently, "because the weather had become so strange and could no longer be predicted—too much rain or not enough, too much wind, too much heat—and the crops were suffering" (*Oryx* 118). The effects of climate change are first felt among poor villagers, who are then forced to turn to desperate measures in order to survive. By contrasting Oryx's childhood, which begins sometime "when Jimmy was seven or eight or nine" (*Oryx* 115) with Jimmy's, Atwood demonstrates how the effects of global warming are felt predominantly by the global South, and, as Amitav Gosh emphasizes, how the "burden of these impacts will be

borne largely by the...poorest people, and among them disproportionately by women” (90).

Jimmy’s childhood, when contrasted with Oryx’s seems practically idyllic; the only problems in Jimmy’s early life are the dysfunctional relationship between his parents and his mother’s breakdown and ultimate abandonment of the family. There are no mentions of crop failures or famine in Jimmy’s childhood. Rather, the extreme climate events that punctuate and shape Oryx’s life go unnoticed by the childhood Jimmy; the only mention of such events are the lamentations of his parents, but for Jimmy such catastrophes are distant; nothing more than things that “everyone’s parents moaned on about” (*Oryx* 63).

The only food security issues Jimmy encounters have to do with the biohacking of genetically engineered food sources, such as the cows and sheep and pigs burned in one of Jimmy’s earliest memories. Although too young to understand the implications of what he is witnessing, we can glean from the conversation overheard between his father and an associate that these animals must be burned, because they were deliberately infected by the competition, in order to “drive up the prices...Make a killing on their own stuff that way” (*Oryx* 17). Unlike the famine that leads to Oryx’s sale as a child, this sabotage has no bearing on the ability to feed the population, and no real impacts on human lives. Rather, the problem is discussed in terms of economics.

Atwood’s trilogy also highlights how climate change will have greater impacts on the poor in the West, not only in the global South. This is emphasized by the disparities between the quality of life in the Compounds (owned and operated by the top Corporations) and the cities (known in the trilogy as the pleeblands), where compound people don’t go unless they have to (*Oryx* 27). In the pleeblands (pleebs for short), “public security is leaky,” and “things were unpredictable” not to mention the fact that the pleebs “were a giant Petri dish: [where] a lot of guck and contagious

plasm got spread around” (*Oryx* 27). According to Crake, if you grew up there you were more or less immune to the risk of disease, but coming from a sheltered compound life Jimmy must first be inoculated before setting foot in the pleebs (*Oryx* 287). While this may have been a ruse in order to inoculate Jimmy against Crake’s bioengineered super-virus and not pleebland viruses and bacteria, the fact that this is a plausible reason to vaccinate Jimmy sheds light on the living conditions in the pleebs.

Finally, we see how the effects of climate change are felt more strongly in the pleeblands than in the compounds, by the necessity of nose cones while visiting— “not just to filter microbes, but also to skim out particulate. The air was worse in the pleeblands...More junk blowing in the wind, fewer whirlpool purifying towers dotted around” (*Oryx* 287). Atwood devotes much more attention to the conditions in the pleeblands in *The Year of the Flood* and *Maddaddam*, but their dystopian nature is clearest when read in contrast with what we learn of the compounds in *Oryx and Crake*.

The effects of climate change are shown to disproportionately affect the poor in *Oryx and Crake*; however, as Dipesh Chakrabarty notes “there are no lifeboats...for the rich and the privileged” when it comes to escaping climate change (“Climate of History” 50). Its effects are still felt (although not equally) by the rich in Atwood’s trilogy. This is most evidenced by the older generation who live in the compounds. They seem to have a basic understanding of the impacts of climate change, and can recall life from before. In fact, Jimmy’s mother’s recognition of the impacts of climate change may contribute to her depression, and she:

rambled on about...how everything was being ruined and would never be the same again, like the beach house her family had owned when she was little, the one that got washed away with the rest of the beaches and quite a few of the eastern coastal cities when the

sea-level rose so quickly...And she used to snivel about her grandfather's Florida grapefruit orchard that had dried up like a giant raisin when the rains had stopped coming, the same year Lake Okeechobee had shrunk to a reeking mud puddle and the Everglades had burned for three weeks straight. (*Oryx* 63)

Additionally, like in the developing world, climate change impacts food security in the compounds as well; while there is not a lack of food, everything is “ersatz” and ethical questions are raised when, after “the coastal aquifers turned salty and the northern permafrost melted and the vast tundra bubbles with methane, and the drought in the mid-continental plains regions went on and on, and the Asian steppes turned to sand dunes, and meat became harder to come by” (*Oryx* 24) people begin to doubt whether the “back-bacon and ham sandwiches and pork pies” on menu at the staff cafe at OrganInk farms are actually pigoon. The pigoon is a transgenic host developed by OrganInk farms, genetically engineered to “grow an assortment of foolproof human-tissue organs” (*Oryx* 22), and containing human neocortex, which makes many people uneasy about eating the animals.

These impacts of global climate change, recognized by Jimmy's mother and reflected throughout the MaddAddam trilogy, can “help [readers] deconstruct their contexts, which is crucial now more than ever” (Wilkinson 25). Atwood's treatment of the environment in her trilogy helps in this work by foregrounding the absurdity of dismissing concerns about the environment as fodder for Jimmy's lunch-time hand puppet shows. Although the environment is not the primary dystopian element in the trilogy, by emphasizing social issues, Atwood demonstrates how such social issues are reinforced by the effects of climate change. Whether the strategy employed by Atwood in this trilogy is enough to encourage social action, as Murphy posits as the goal of science fiction (26), is up for debate. She presents many ways of living

through the climate crisis, and offers many critiques, ranging from her critique of scientific development and the commodification of science to shallow environmentalism, religious organizations, and deep ecologists alike.

Paolo Bacigalupi

Where Atwood's MaddAddam trilogy demonstrates how emphasizing the maintenance of the status quo of a capitalist economy can lead to the willful ignorance of climate change, Paolo Bacigalupi's novels, *The Windup Girl* (2009) and *The Water Knife* (2015) demonstrate what happens when a capitalist economy persists during the climate crisis, capitalizing on dwindling natural resources. These novels, although not a series like Atwood's, share many common themes both with each other, and with the MaddAddam trilogy. A primary focus of both novels is the demonstration of how even in the face of global catastrophe, without social change many of today's dangerous systems will persist. They demonstrate how eco-apocalyptic narratives are just as problematic as their more conservative counter parts (both techno-utopian and strategic realism discourses) (Szeman). Apocalyptic Environmentalism, or eco-apocalyptic discourses posit that social and political change is necessary to address the issues of peak oil (or climate change more broadly), and suggests that ecological disaster may be the catalyst required for such change (Szeman 63). However, these post-apocalyptic novels demonstrate a persistent lack of social change, despite wide-scale famines and drought. In fact, in each of these novels, the capitalist economy is more inequitable and unjust than in today's world, as its primary commodities become calories (*The Windup Girl*) and water (*The Water Knife*).

The Windup Girl is a novel about what happens when calories become currency and bio-terrorism is used to drive up profits. Crop failures and famine are global phenomenon

everywhere but the Thai Kingdom in which the novel is set, and where Anderson Lake (employed by the calorie company AgriGen) seeks to discover the Thai Kingdom's secret to success. However, the Thai Kingdom's success is threatened by both global climate change and a shifting political landscape, in which the warring factions of Trade (headed by Akkarat) and Environment (headed by Jaidee and later Kanya) ministries argue over whether the Kingdom should remain isolated or should re-join a burgeoning global trade.

In *The Water Knife* climate change's increasing temperatures have resulted in a drought in the American West. Each state impacted by the drought tries to stay afloat by employing water knives who buy and steal water rights, attempting to ensure the survival of their state. The novel details the impacts of the drought through three characters: Lucy, a journalist bent on documenting the collapse of Phoenix and the corruption that follows; Maria, a climate refugee from Texas; and Angel, a water knife working for Catherine Case who runs the Southern Nevada Water Authority.

Whereas the environment features predominantly as background noise or setting in Atwood's novels, it is deliberately front and center in both of Bacigalupi's novels. In an interview with Analee Newitz, Bacigalupi is quoted, saying:

I'd like it [the hard science of the environment] to become more of a component that figures into SF. My fear is that it becomes a window dressing—that we create lots of global warming futures where sea level has risen. Or there's a tip of the hat to various species going under—a wave of the hand saying yes this is our world—but it's not really an engagement. One way SF can go is to treat it less as a setting a more as a major component of the story.” (qtd in Hageman 285)

Bacigalupi succeeds in this goal in both *The Windup Girl* and *The Water Knife*, as the

environment and weather are key players in the diegesis of both novels.

Building off his short story “The Calorie Man,” Bacigalupi’s *The Windup Girl* depicts a world in which calories are currency, and calorie companies bioengineer plagues to manipulate the Lauderdale Paradox, like to the corporations in Atwood’s trilogy. As Hageman puts it *The Windup Girl* takes place in:

an economic and historical interstice in which the modes of production have drastically shifted in response to the scarcity of petroleum such that the previous owners of the means of production must reassert their positions of control. This transition process makes visible economic and ecological contradictions in...horrific ways.” (283)

Corporations “reassert their...control” through agriculture. Genetic engineering allows the patenting of genes and their ownership by corporations, driving up prices and resulting in the starvation of the global poor.

Calorie companies have risen to prominence in part due to global climate change, which is a persistent threat in the novel. Drought and rising sea levels threaten to overwhelm the Thai Kingdom in which the novel is set. In *The Windup Girl* global civilization and trade have collapsed, and we watch the Thai Kingdom—one of the sole remaining civilizations—as it struggles to stay afloat (literally and figuratively) while struggling to manage its relationship with American calorie corporations. The Thai Kingdom wishes to remain autonomous, but must rely on Calorie Corporations who are necessary to furnish the kingdom with plague-resistant crops. However, these corporations also seek to infiltrate the Thai Kingdom’s autonomous seed bank and steal their secrets. Thus, while the primary drama of the novel has to do with calories many of the plot elements depend on the environment (whether the monsoons will come and crops will grow, whether the dikes will hold or whether the Kingdom will drown), making the

environment more than a simple setting.

It is unclear precisely what causes have led to the post-apocalyptic society in the novel, but we can infer enough from *The Windup Girl*, and its precursor, “The Calorie Man,” to ascertain that societal collapse has something to do with the confluence of reaching peak oil, and the dangers of relying solely on vulnerable, genetically engineered mono-crops. Sean Donnelly points to the increasing popularity of peak oil narratives in speculative fiction such as Bacigalupi’s, which explores “oil’s receding tides and the advancing tides of climatic change” (Nixon qtd. in Donnelly 157). Although the lack of oil is a marginal issue in *the Windup Girl* whose presence is predominantly felt in the attempts to develop new energy technologies, reaching peak oil seems to be a major force contributing to the rise of calorie monopolies.

In *The Windup Girl* we see on a temple wall scenes of old Thailand: “the *farang* [foreigners] releasing their plagues on the earth, animals and plants collapsing as their food webs unraveled...” (142). “The Calorie Man” seems to be set in America, and hints at the causes of collapse; Lalji explains, “AgriGen created SoyPRO. And everyone thought they were such wonderful people...And then the weevil came, and suddenly there was nothing else to eat” (12). It is believed that calorie companies conspired to wipe out native species, but once they did their genetically engineered monocrops were vulnerable to disease and failed to produce enough to feed their customers. The theory that calorie companies deliberately released plagues to corrupt native or heirloom crops is supported in “The Calorie Man,” when Bowman explains how his garden survived the threats of Nippon genehack weevils, or curl.11.b, or cibiscosis bacteria; “there isn’t another heirloom planting within hundreds of miles. This is an island in an ocean of SoyPRO and HiGro. It makes a formidable barrier” (17).

This conspiracy demonstrates how the Lauderdale Paradox is also at work in Bacigalupi’s

fiction. Bellamy Foster explains how private riches (exchange values) can be generated by destroying public wealth (use values) “by generating scarcity in what was formerly abundant” (10). Like in Atwood’s trilogy, corporations release plagues, but in Bacigalupi’s works the plagues affect crops not human health. By destroying crops previously owned and managed by farmers, Calorie Companies can step in, releasing genetically engineered crops that are patented and sterile, which means that farmers must purchase new seeds every season rather than relying on those which would previously have been produced by their own crops. As Bowman puts it: “A genetic dead-end. A one-way street. We now pay for a privilege that nature once provided willingly, for just a little labour” (“Calorie Man” 22).

Although much less discussed than calories in either “The Calorie Man” or *The Windup Girl*, we can also infer that the use of fossil fuels contributed to global warming and increasing unpredictability in the environment and weather patterns. In “The Calorie Man” gasoline is a thing of the past, and all energy is derived from calories and kinetic energy generated by megadonts or human labour, stored in kinksprings. In *The Windup Girl*, gasoline and methane are not obsolete but are highly regulated; kinksprings are the dominant source of energy. The scarcity of gasoline situates *The Windup Girl* as a “manifestation of the trend towards dystopian and post-apocalyptic generic modes concurrent with the blossoming peak oil anxiety of the early twenty-first century” (Donnelly 158). Although illegal methane is common, there is “approved-burn methane” regulated by the Environment ministry, derived from methane composters. Similar to the carbon-garboil system in the *MaddAddam* trilogy, these composters take any inedible organic waste, from dead animals to “the daily fruit rind and dung collections,” and “bake [it] steadily into compost and gas and eventually light the city streets with the green-glow of approved burn methane” (*Windup* 22). Coal and diesel are reserved for the military and the

extremely wealthy, indicating either their scarcity, or the strictness of environmental regulations. Such regulations are necessary, due to the precariousness of the climate and the threat of the ever-rising sea, held at bay by the Kingdom's frequently mentioned seawall.

We are left to infer the causes of global societal collapse in *The Windup Girl* due to the temporality of the novel. Whereas Atwood's post-apocalyptic novels take place in the near future, immediately following the collapse, *The Windup Girl* is set in a much more distant future. The novel skips over what could have been an eco-apocalyptic narrative (in Szeman's sense of the term), and demonstrates instead a future in which a new energy form has been developed, and some societies are flourishing. The temporality in the novel results in different politics than those presented in Atwood's trilogy. It demonstrates how we cannot simply blame the actions of humanity in the past for the climate problems challenging us today. Rather, our current actions also need to be scrutinized, in order to recognize how they may persist and evolve, even during the apocalypse. While the "waterless flood" in Atwood's novels results in a collapsed society without an economy, let alone a late capitalist economy, the collapse of the Expansion period in Bacigalupi's novel demonstrates how market forces can survive along with humanity.

In the first chapter of *The Windup Girl*, we receive the first hints of the post-collapse society when we are introduced to Anderson's kink-spring factory. He is working on a revolutionary product, which will make power portable like it was during the days of gasoline (*Windup* 5). The factory itself is powered by megodonts, a large, genetically engineered elephant-like animal with near human intelligence. The megodonts turn the power spindles, and "comprise the living heart of the factory's drive system, providing energy for conveyor lines and venting fans and manufacturing machinery" (*Windup* 8). The kinksprings being produced in the factory harness such kinetic energy as produced by megodonts or humans, turning it into potential energy to be

stored and released. Despite this revolutionary energy-storage system, the post-carbon world still maintains many dystopian elements, indicating how techno-utopian solutions do nothing to ameliorate society unless accompanied by social change.

Like in Atwood's trilogy, dystopian societal and climate factors are also closely entangled in Bacigalupi's novels. The Thai Kingdom is controlled by several corrupt ministries, presumably set up after the collapse of the "Expansion Period." The warring ministries are Trade and Environment, but as it becomes clear by the end of the novel their jurisdictions are similar and overlapping; the separation of trade and the environment into ministries with opposing goals can be construed as a major challenge in the novel, defamiliarizing today's politics. The Environment Ministry has a cautious outlook; its logo is "the eye of a tortoise, for the long view— the understanding that nothing comes cheap or quickly without a hidden cost" (*Windup* 121). This leads to isolationist tendencies and corruption among its employees--the white shirts--many of whom do not believe in the ministry's slogan, and take bribes for quickness and easiness. The Environment Ministry's reach extends beyond protecting the genetic diversity of the Kingdom and controlling approved-burn methane consumption, but also to areas that seem to be Trade's jurisdiction, as seen when they interfere with Lake's shipment of algae tanks and nutrient cultures. This episode demonstrates both the corruption of the white shirts and their isolationist tendencies. Focalized through Jaidee, who is collecting bribes from Trade's customs agents, we hear him think, "protecting the Kingdom from all the infections of the natural world is like trying to catch the ocean with a net" (*Windup* 47). Jaidee and his men have just raided a dirigible, belonging to the *farang*, or foreigners who conduct business with the Kingdom. Jaidee's worries highlight the intersection between Environment and Trade, emphasizing the false dichotomy between the two Ministries in the novel, suggesting also how the interests of economics and

environment are equally immiscible in today's world. Jaidee muses:

The Thai Kingdom is being swallowed... They are being swallowed by the ocean. Nearly every crate holds something of suspicion. But really, the crates are symbolic. The problem is ubiquitous: grey-market chemical baths are sold in Chatachuk Market and men pole their skiffs up the Chae Phraya in the dead of night with hulls full of next-generation pineapples. Pollen wafts down the peninsula in steady surges, bearing AgriGen and PurCal's latest genetic rewrites, while Cheshires molt through the garbage of the *sois* and jingjok2 lizards vandalize the eggs of nightjars and peafowl. Ivory beetles bore through the forests of Khao Yai even as cibiscosis sugars, blister rust, and *fa'gan* fringe bore through the vegetables and huddled humanity of Krung Thep. It is the ocean they all swim in. The very medium of life. (*Windup* 47-8).

This quote emphasizes the threats faced by the Thai Kingdom and the necessity of the Environment Ministry, while also subtly pointing to the corruption of the white shirts, as grey-markets and smugglers would not be able to exist without their complicity.

The widespread corruption in the Environment Ministry creates additional conflict with Trade, who's aims are already at odds with Environment's. Whereas the Environment ministry enforces regulations that have allowed the Thai Kingdom to prosper, Trade wants more lax borders and regulations and is influenced by foreign interests, such as Richard Carlyle's, who "speaks so causally about changing pollution credit systems, of removing quarantine inspections, of streamlining everything that has kept the Kingdom alive as other countries have collapsed" (*Windup* 51). By changing these systems, Carlyle could re-open global trade, allowing Americans to profit from Thai success. Additionally, when Jaidee breaks into the Trade Ministry, he muses at their lights, fueled by coal "as though the Contraction never happened, as though

there were no sea walls needed to keep back the ocean” (*Windup* 172). Trade blatantly ignores the carbon regulations, burning coal with no eye to the future or thought for the impacts of their actions.

In *The Windup Girl*, the primary purview of the Environment Ministry is monitoring methane consumption and protecting from agricultural plagues. However, historically, particularly during the period of collapse, their range extended to what may be considered more traditional environmental concerns, such as:

the rising sea levels, the need to construct dikes and levees. And then came the oversight of power contracts and trading in pollution credits and climate infractions...Then there was the monitoring of fishery health and toxin accumulations in the Kingdom’s final bastion of calorie support...And there was the tracking of human health and viruses and bacteria (*Windup* 121).

While the environment can be ignored in the MaddAddam trilogy by isolation in the compounds, or in arcologies in Bacigalupi’s later novel, *The Water Knife*, in *The Windup Girl* the environment must constantly be managed and plays a much greater role in the lives of the characters.

The constant threat of climate catastrophe and the tension between the Trade and Environment ministries are not the only dystopian elements in *The Windup Girl*. In Bacigalupi’s post-apocalyptic world, calories are currency, and Calorie Companies and gene-rippers seek to access the Thai Kingdom’s seed bank, which continues to produce plants that no longer exist anywhere else. In a world rife with agricultural plagues and pests such as cibiscosis, Nippon genehack weevil and blister rust, the Thai Kingdom continues to grow clean produce. Where “India and Burma and Vietnam [have all fallen] like dominoes, starving and begging for the

scientific advances of the calorie monopolies” the Thais have remained autonomous (*Windup* 3). Anderson Lake, the novel’s primary gene-ripper and *farang*, is in Thailand to uncover the secrets of their nightshades and *ngaw*. Lake’s motives are not altruistic, however. He seeks to profit from the Kingdom’s secrets: “A unique gene that resists a calorie plague or utilizes nitrogen more efficiently sends profits skyrocketing” (*Windup* 3).

It is somewhat difficult to infer why unraveling the secrets of the Thai’s agricultural success is so important to the calorie companies who were initially so powerful. It is likely that they have encountered a problem with the minimal genetic diversity of their genetically engineered crops. Lake says early in *The Windup Girl* that AgriGen’s “last strain of HiGro Corn only beat weevil predation by sixty percent...People are starving” (6). Hence he covets the genetic diversity buried within the Kingdom’s seed bank, believing that with access to it, “Des Moines could mine genetic code for generations, beat back plague mutations. Stay alive a little longer” (*Windup* 86). Although at times it seems that Lake feels compassion for the starving, he is no less corrupt than the white shirts. Working with Carlyle, Lake helps catalyze the riots and revolution at the end of the novel, by attempting to overthrow the Environment Ministry and install Akkarat (head of Trade) as the head of government. This would ensure Lake’s access to the Thai seed bank, and benefit both parties; as Lake puts it, his company is willing to “offer significant assistance to the Kingdom” if they can come to an agreement, “help[ing] with...border disputes” and “calorie security that hasn’t been enjoyed since the Expansion” (*Windup* 232).

The unstable political climate is worsened by the unpredictable climate of the Kingdom’s environment. This combination adds to the dystopian elements of the novel, and like Atwood’s trilogy serves to demonstrate how the poor and vulnerable populations are most at risk in times of crisis. The unpredictable climate (the lack of rain, and then the sudden onslaught of the

monsoons) bolsters the already perilous political situation by raising tensions and preventing travel due to closed waterways. This traps the city's vulnerable population who lack the funds to flee by any means other than boat; without the arrival of the monsoons, travel by boat is impossible due to low water levels.

The monsoons are a constant concern in *The Windup Girl*, whether due to drought, or due to the risk that they will overpower the seawall and cause the Kingdom to flood. Characters speculate about whether the monsoons will arrive at all:

The dry season never ends. Will the monsoon even come this year? Will it save them or drown them? There are gamblers who bet on nothing else, changing the odds on the monsoon daily. But with the climate so much altered, even the Environment Ministry's own modelling computers are unsure of the monsoon from year to year (*Windup* 239).

In addition to the increased tension in the Kingdom due to the lateness of the monsoons, the interactions between the warring political factions become clear, as we witness the consequences of the entanglement between commerce and the environment. In the midst of an attempted political coup by Trade, which ultimately only incenses the Environment Ministry's White Shirts leading to increased crackdowns and killings, a new strain of plague breaks out. This plague, an unknown hybrid of blister rust and cisbiscosis has killed three people, and nothing is known about its behaviour. In an attempt to learn about the strain, Kanya, who takes Jaidee's role as head of the Environment Ministry after his death, turns to Gibbons for help. Once a Calorie Man, Gibbons now works for the Thai Kingdom as a generipper.

Gibbons has a different outlook on the environment than most characters in the novel. In fact, we can draw many parallels between Gibbons and Crake, from Atwood's *Oryx and Crake*. For Gibbons, the new disease and the threat of flood are only small parts of the change humans

have wrought on the Earth. We can read Gibbons as a proponent of the Early-Anthropogenic Hypothesis.² Gibbons claims: “The ecosystem unraveled when man first went a seafaring. When we first lit fires on the broad savannas of Africa. We have only accelerated the phenomenon... *We are nature...* We are what we are, and the world is ours. We are its gods” (*Windup* 243). Such an outlook fosters nihilism and reinforces the problems that the Environment Ministry is up against. Mindset’s like Gibbons (those who believe the Early Anthropocene hypothesis) naturalize the destruction of the environment as part of ‘human nature.’ However, it is not ‘human nature’ that is responsible for climate change in *The Windup Girl*; it is trade (fueled by carbon consumption) that not only threatens the Thai Kingdom through sea-level rise, but also through the spread of disease. The impacts of an increasingly global Trade in the novel defamiliarize the impacts of global capitalism on today’s environment, demonstrating how it is a capitalist economy (and its reliance on fossil fuels), not human nature, that is to blame for the climate crisis.

The environment returns to prominence at the end of Bacigalupi’s novel when it rises up as if to protest the new administration, in which *farang* calorie executives are granted access to the Thai seed bank in order to re-open global trade. The novel culminates when Kanya ultimately chooses a side, allowing Jaidee’s ‘pure’ influence to win her over. She recognizes that the protection of the kingdom’s people should be more important than the protection of the abstract idea of the Kingdom. Kanya massacres the foreigners before they are able to steal the valuable genetic material, and evacuates the seeds to an undisclosed location. Simultaneously the locks and pumps that hold the sea at bay are destroyed, and the Kingdom floods. Finally, adding to the chaos of human made environmental change, the monsoons that we have been waiting for over

² Ruddiman’s early-anthropogenic hypothesis (2003) cited evidence that anthropogenic effects on the environment and global climate began thousands of years ago, and reached significant impact before the industrial era (Ruddiman 46).

the course of the novel finally arrive, and “the last attempts at holding back the ocean [are] abandoned” (*Windup* 355). As the city is deserted, the novel ends on a hopeful note: the Environment Ministry is restored with Kanya at its head. The white shirts’ corruption is forgotten, as they work to evacuate the city and protect the seed-stock of the Kingdom.

The Water Knife, written in 2015, deals with similar themes as *The Windup Girl*, but is set in the American Midwest. In this novel by Bacigalupi, the Midwest is in the middle of “Big Daddy Drought;” the Colorado River has nearly run dry, with no chance of replenishment due to lack of rain and snowfall. Water is commodified and controlled by agencies like the Southern Nevada Water Agency (SNWA), and similar organizations in California (IBIS). The novel is focalized through three characters, all impacted by the drought in different ways. Angel is a water knife, working for the Queen of the Colorado--Catherine Case--who seeks to keep Las Vegas from drying out at any cost. Lucy is a journalist, documenting the collapse of Phoenix as their water becomes increasingly scarce, and working to document the corruption of city officials and water authorities. Finally, Maria is an environmental refugee, driven from Texas and desperately trying to make it North to where there is water.

Whereas *The Windup Girl* is post-apocalyptic, *The Water Knife* is pre-apocalyptic. The plot hovers on the edge of disaster, while water knives like Angel seek to stave off disaster for small enclaves of the desert’s population. The novel opens with an apocalyptic foreshadowing: “If the end of the world came like Catherine Case said it would...” (*Water* 5). If anyone can make such ominous predictions, it would be Case; she controls the fate of cities by controlling their water. Case has the power to literally shut cities down by shutting off their water, as we see her do with Carver City. Because Las Vegas has senior water rights, Case has the power to shut down the water supply of thousands of people. We see the ramifications of Case and others’ actions

throughout the novel, as climate refugees struggle to survive without water, and attempt to migrate north.

Water politics ultimately determine whether the apocalypse will occur, either through environmental or social forces. The novel demonstrates how corruption can develop when people are desperate, and like the MaddAddam trilogy warns us of the dangers of allowing private corporations unlimited power. Apocalyptic sentiments permeate *The Water Knife*, as even those in power are forced to question their actions. As Angel muses in the beginning of the novel, “*it’s the end of times*, [he] thought as more missiles pummeled the water-treatment plant. *It’s the goddamn end of times*. And then on the heels of that thought, another followed, unbidden. *Guess that makes me the devil*” (*Water* 20, emphasis original).

Exacerbated by politics, the primary climate catastrophe in the novel arose due to human hubris and lack of foresight. There are numerous examples of strange environmental conditions acknowledged over the course of the novel, but the emphasis is on Big Daddy Drought, affecting the Midwest United States. The drought reinforces structural problems inherent in the cities in the novel: namely, that they were built in deserts not meant to support large human populations. As Angel notes, the cities and their water supplies were created during optimistic times, but have always been vulnerable (*Water* 10). When the effects of climate change begin to be felt, melting the Rockies’ snowcaps and causing a drought, it becomes clear that the lack of water cannot be handled by bureaucracy or engineers; talk of “acre-feet and reclamation guidelines and cooperation, wastewater efficiency, recycling, water banking, evaporation reduction and river covers, tamarisk and cottonwood and willow elimination,” is meaningless— as futile as “trying to rearrange deck chairs on a big old *Titanic*” (*Water* 14).

A key reference in *The Water Knife* is Marc Reisner’s *Cadillac Desert: The American West*

and its Disappearing Water, published in 1986, which emphasizes how the developmental policy of the American West had detrimental impacts on the environment and water availability.

Catherine Case, Queen of the Colorado, makes all her new hires read it. She “likes [them] to see this mess isn’t an accident. [That they] were headed straight to Hell, and didn’t do anything about it” (*Water* 160). However, as one of Lucy’s friends points out, this is not news: “John Wesley Powell³ saw it coming way back in 1850. So it’s not like no one had warning. If that fucker could sit on the banks of the Colorado River a hundred fifty years ago, and know there wouldn’t be enough water to cover everything, you’d think we’d have figured it out too” (*Water* 30).

By referencing *Cadillac Desert*, Bacigalupi connects *The Water Knife* to the history of water politics in Los Angeles and the American West, implying historical precedent for the events in his novel, and also suggesting that our inability to learn from the past will come back to haunt us. Perhaps the most famous historical precedent for Bacigalupi’s fiction is the development of Los Angeles. The water wars that allowed for its development are popularly depicted in *Chinatown*, directed by Roman Polanski. The film deals with the proposed construction of a water reservoir to help a Los Angeles impacted by drought as well as the deliberate wastage of gallons of water. The lead detective in the film, J. J. Gittes, discovers a plot wherein water officials have been driving farmers off their land by stealing and poisoning their water, so that they can buy the land at a reduced price, after which a new dam and water

³ John Wesley Powell was an American geographer, geologist and anthropologist. He is well known for his contributions to the fields of natural resource use and land use planning. In 1868 he led a party that mapped the Colorado River, and a decade later published a report entitled “Report on the Lands of the Arid Regions,” about agriculture in those areas. He argued that due to the lack of water agriculture should be managed differently than in Northern regions, with small farms and collective irrigation systems, as well as warning that individual land owners, and not the corporations should be in charge of the regions water (Lee).

distribution system will allow the companies to irrigate their newly purchased farmland, increasing its value. While the film does not correspond directly the history of Los Angeles, there are many parallels in how the city was shaped by water politics, ultimately annexing the San Fernando Valley and “murder[ing] the Owens Valley in its first great raid of hinterland waters under William Mullholland [the city’s chief water engineer], and its hydrological frontier is now on the Colorado River” (Banham 13). Thus, Catherine Case’s ability to simply shut down cities by controlling their water is not a fictitious exaggeration; it is based in historical precedent. As Mike Davies writes in *City of Quartz*:

Water, in any case, was becoming scarcer as protracted drought escalated the water wars that pitted Southern California against Northern California and Arizona. As the withdrawal of Los Angeles water from Mono Basin on the eastern flank of the Sierras, threatened local ecological catastrophes, Los Angeles water authorities debated the unsavory last resort of purchasing water allotments” (199).

We can see this history reflected in Bacigalupi’s novel, which raises questions about our continued behaviours and lifestyles, and the value of novels like Bacigalupi’s. If we cannot learn from our past errors, can we learn from future predictions offered to us in a fictional mode?

Despite such historical knowledge, development in desert cities persists, in both Bacigalupi’s novel, and in our world. So do corruption and water wars. In *The Water Knife*, a Californian water executive working for Ibis outlines the problem, stating, “That’s a lot of people fighting over too little water” (*Water* 45). In Bacigalupi’s novel, development continues through the construction of arcologies— self-sustaining communities where no one will never have to venture outdoors. In the arcologies, “life could still be good, even in Hell,” thanks to “A/C and industrial air filters and 90 percent water recycling” (*Water* 349). The contradiction of continued

development can be seen in Angel's conceptualization of the arcologies; while he condemns cities like Nebraska, Kansas, Oklahoma and Texas for "pretending greenery and growth as they mined glacial water from ten-thousand-year-old aquifers" and dreaming of "being different from what they were" (*Water* 80), he sees the arcologies as "offering salvation" through "technological wonders" (*Water* 52).

Keith Booker writes that "dystopian literature [includes] those works that rely on a dialogue with utopian idealism as an important element of their social criticism" (3). This is true of *The Water Knife*; while the arcologies can be taken as a utopian escape from the drought and dust storms of Vegas and Phoenix, they reinforce and create inequalities in the society. Further, although the technologies employed by the arcologies are impressive, and while their recycling systems do make life in the desert feasible, Bacigalupi's novel raises questions about the desirability of such a future, particularly when it is only available to those who can afford residence within.

While the environment and environmental politics feature as primary dystopian elements in *The Water Knife*, like most dystopian fiction Bacigalupi's is also concerned with more traditionally dystopian elements, such as inequality and lack of social freedoms. We can draw parallels between Bacigalupi's arcologies and Atwood's Compounds. Both contribute to the dystopian natures of their respective worlds, as they reinforce inequalities between the rich and the poor, forcing the poor to live in unsafe environmental conditions. Inhabitants of the arcologies have continuously filtered air and nearly unlimited water supplies. By contrast, residents of Phoenix who cannot afford to live in the Taiyang arcology must deal with drought and daily dust storms and the associated health hazards (Maria's girlfriend Sarah is coughing up blood more and more often, while Lucy mentions the risks of being outside without a dust mask:

wildfire smoke and dust and valley fever, as well as the *Coccidioides* fungus). Like Atwood's pleeblands, there are also other risks associated with living outside of the arcologies, namely the violence associated with having to pay dangerous slum lords to live in substandard living conditions. Both Atwood's Compounds and Bacigalupi's arcologies are exclusive, and expensive. The arcologies don't like "when scraps of the apocalypse like [Lucy] squeezed inside...In its own way the Taiyang controlled its borders as rigorously as Nevada or California. The reward for Taiyang inhabitants was a space that felt as if it were entirely removed from the dust and smoke and collapse of the greater city beyond" (*Water* 172). Like the Compounds, the arcologies are protected by their own security forces, which work to ensure their exclusivity.

Additionally, like in Atwood's MaddAddam trilogy, the media is also controlled by corporations and the government in *The Water Knife*. Lucy is a journalist documenting the collapse of Phoenix. Her hashtag is "#PhoenixDowntheTubes," and she is interested in the corruption of the government and water corporations. She quickly learns that there are subjects that she can and cannot write about. When Lucy is still 'green'-- fresh from Connecticut--she encounters her first body: "a pretty Hispanic girl, marionette-shattered, lying naked in the bottom of a swimming pool" (*Water* 64). Ray Torres, a cop, gives Lucy her first warning, saying "You don't got to write about the bodies...This ain't the kind of thing a pretty Connecticut girl wants to be writing about" (*Water* 64). And later, Torres again, "Seriously. Don't write about the bodies. They got a way of making more trouble than they're worth" (*Water* 65).

While Torres' warnings are in order to protect Lucy from the retaliation that she may encounter if she begins investigating the city's many dead bodies, she also receives more ominous threats. Lucy writes many stories that are critical of California, as like Vegas, they too are in the water buying business. One day, an employee from one of California's water

companies makes Lucy an offer:

Maybe [she] should stop worrying about what California was doing here or there and spend more time worrying about other things. Maybe [she] could focus more on Colorado River Compact revisions, or changes in staffing in the interior department. Or Nevada... Write about shadowy Las Vegas water knives. Or maybe write about how America doesn't have enough FEMA staff to handle hurricanes on the Gulf and tornadoes in the Midwest, and floods on the Mississippi, and seawalls collapsing in Manhattan... and how the federal government doesn't have enough energy to take care of a bunch of Texans whose towns have just dried up... and then he pushed a stack of yuan over to [her] that must have been eight inches tall (*Water* 167).

When Lucy pushes back, the tires of her car are knifed, and she learns not to write about the bodies, or about the money, or about the Calies, because they will “make sure you stop writing for good” (*Water* 168).

Margaret Atwood's MaddAddam trilogy and Paolo Bacigalupi's novels, *The Windup Girl* and *The Water Knife* are examples of recent climate fiction. They reflect anxieties about the effects of climate change on both our environments and our societies, and how climate change can lead to or reinforce dystopian elements in existing societies. Although both authors remain concerned with traditional dystopian elements, they make space in their novels to think about climate change as well. Per Sylvia Mayer, we may classify these works as ‘risk narratives of catastrophe:’ dystopias that “[explore] the risk of climate change by focusing on a future marked by climate collapse”—even though [they] foreground societal collapse rather than the environmental conditions that brought it about” (qtd. in Von Mossner 561).

Both authors use deliberate strategies to achieve this aim; I argue that Atwood deliberately shows us the environmental degradation in her works without having it being a primary concern of the narrative or integrating it into the plot, whereas Bacigalupi deliberately turns the environment into a plot element in both of his novels. Both strategies seem to conform to the roles of climate fiction as reflected by the *New York Times* discussion forum mentioned in the introduction to this chapter (Whiteley et al 29). They reflect anxieties about climate change, and also make the issue more acceptable, perhaps motivating the public to take action. Atwood's strategy in the MaddAddam trilogy strikes me as conforming to the former purpose, reflecting anxieties but offering little in the way of potential solutions. Bacigalupi's works, on the other hand may conform to the later; despite their deeply dystopian tales, they both hint at how to behave in such crises; Kanya ultimately protects the Thai seed bank, and Lucy is willing to die to ensure Phoenix is given their rightful water rights.

Are there other ways climate fiction can function in today's society? Hageman argues that "as a genre science fiction is well positioned to contribute to social conversation about the role of technology in possible ecological futures" (284). Both of Bacigalupi's novels, as well as Atwood's trilogy, contribute to this conversation, and offer guidance about the dangers of technoutopian solutions for the climate crisis. As demonstrated, such solutions tend to reinforce inequalities, and do little to mitigate the effects of climate change. Hageman suggests that Bacigalupi's climate fiction is unique in its vision of the future, in that it demonstrates contradictions inherent in the "key concepts underwriting the ecological crisis" by remapping capitalist politics, the role of the nation state and multinational corporations, and the dynamics between "capitalist commerce and ecological sustainability" (284). The same can be said of Atwood's trilogy. Both authors interrogate and foreground the connection between a capitalist

economy and climate change and challenge assumptions about the potential of techno-utopian solutions to provide last minute solutions to the problems of climate change.

Both authors also share similar optimistic visions of the future, which may offer readers signposts for living in today's world. Both Atwood and Bacigalupi seem optimistic about the roles that art and religion can play in an eco-apocalyptic future. Even though the only reference to literature in *The Windup Girl* is the despised, genetically engineered cheshires, as Hageman claims, "the cheshires are a narrative element that reminds us how literature...really can shape attitudes and actions capable of shaping and reshaping ecology" (296), as they were created by a calorie executive as a party favour, the year his daughter "turned as old as Lewis Carroll's Alice" (*Windup* 26). In *The Water Knife*, not all of the media is produced and controlled by malicious forces. Angel's favourite TV show, *Undaunted*, is funded by the UN High Commissioner for Refugees. It is propaganda in order to "make Texas refugees more relatable to Americans in the Northern States" (*Water* 284). The production of a show that aims to help the Texan refugees may point to what Maria asks for when she says she has no need to read *Cadillac Desert*; she has no desire to read about how things used to be, but wishes instead for "a book about how [she's] supposed to live now" (*Water* 181). We may take climate fiction like Bacigalupi's and Atwood's as examples of such a novel. In *The Year of the Flood*, the God's Gardener's hymns offer guidance about how the Gardeners should live: harmoniously and respectfully with all of God's creatures. Toby collects these hymns in *MaddAddam*, memorializing the Gardeners' traditions and keeping a journal of life post-flood, which she shares with the Craker child Blackbeard, suggesting that such writing will not only help them live in the present, but offering hope for the future as well.

While Clive Hamilton argues that "by 'clinging to hopefulness' we forestall facing the truth

about humanity's 'diminished' future (qtd. in Bouson 351), we might instead turn to Von Mossner's study on young adult cli-fi, which finds that "in young adult dystopian writing, narrative elements that cue negative emotions...are deliberately combined with elements that evoke more positive emotions...in order to make the reading palpable for young readers and to not extinguish their hope for a better future" (554). One could make the argument that such a strategy remains valuable among older readers. After all, if we have no hope for the future, we are unlikely to take the appropriate actions today regarding the environment that will allow the possibility of such a future.

Chapter 4

I began this research looking to discover whether environmental representations in dystopian literature differed before and after global warming was recognized as a phenomenon in 1975. Given dystopian literature's role of representing popular anxieties, I wanted to determine whether global warming, or climate change, had entered into the cultural imaginary in any significant way. I posited that if there is cultural anxiety about climate change, we would see increased representation of the climate crisis in dystopian literature after the year 1975. However, as I read a wide array of novels from before and after 1975, it became clear to me that this question was more complicated than I anticipated. In some novels, like Ursula Le Guin's *The Word for World is Forest*, the environment is a metaphor for a way of living, and is used to condemn the Vietnam War. In others, like Bacigalupi's novels, the environment is used to emphasize social problems, while still remaining front and center in the text. The environment and various forms of climate change are present to some degree in all of the novels examined, regardless of when they were written. In this chapter I will outline the key differences I discovered, but I will also demonstrate how these novels work on a continuum, having more in common than I initially anticipated.

I took as the starting point of my research a claim made by ecocritic Kate Rigby that "nature is only thematic in literature when it becomes a problem in reality" (358). My research complicates this notion, as how to define "thematic" is complicated by several factors. Can nature be thematic if the storyline is primarily anthropocentric in perspective? Can nature be thematic if it is deliberately un-thematic in a text? What are we to make of Ballard's early climate fiction, wherein nature is thematic, and humanity is relegated to the margins? How does context influence how we understand a text? For example, older texts like *The Word for World is*

Forest seem explicitly concerned with climate change and environmental justice; however, modern readers are coming at such texts through the lens of climate change. Readers from when Le Guin's work was originally published would likely come away with an entirely different theme. Thus, my initial research question generated many more questions, which I will try to address here.

In short, environmental representations are better understood as falling somewhere along a continuum that factors in both when they were written, and the degree to which they deal with environmental as well as social concerns. Karen Stein suggests that the topic of dystopian fiction has shifted between the twentieth and twenty first centuries. She writes: "In the late twentieth and early twenty-first centuries we find a prevalence of dystopias fraught with cynicism, mistrust of government, worries about technology, and fear for the future of our planet. And the source of the problems in these recent dystopias has changed from political causes to environmental ones" (Stein 47). She continues, "the fictional dystopias of the twentieth century...reflect the anxieties generated by the by the unstable economic and political conditions that produced the Depression, World War II, and the Cold War—tend to blame totalitarian governments as the source of the problems...current dystopias tend to invoke environmental catastrophes- usually instigated by intentional or unintentional human actions- for the upheavals" (Stein 47). However, my research finds that such a clear-cut division between 20th and 21st century dystopias oversimplifies matters. On the surface, this claim is certainly true; the dystopian novels selected from before 1975 do reflect a different set of anxieties; for example, the Vietnam War and the nuclear arms race. However, the environment still features in these novels, and even as current dystopias tend to invoke environmental catastrophes, they are not free from traditional anxieties such as totalitarian governments or other political concerns. As Newman writes, "how nature writers see

and understand nature has everything to do with how they see and understand the society whose relations they hope to change” (qtd. In Buell 27).

It is not enough to say that the causes of modern dystopian literature are environmental; we must take into account how the political (relegated by Stein to dystopian literature from the 20th century) shapes the environment. The environment cannot become dystopian on its own; it often becomes so due to dystopian political conditions. To begin to think about how we can conceptualize a continuum of environmental representations in dystopian literature it is helpful to return again to Ursula Heise’s idea of the “triple allegiance” of ecocriticism. To reiterate, she claims that ecocriticism must concern itself with “the scientific study of nature, the scholarly analysis of cultural representations, and the political struggle for more sustainable ways of inhabiting the natural world” (506). If we construct a continuum from left to right, where texts falling on the left hand of the spectrum have minimal engagement with the environment, and those falling on the right hand of the spectrum engage heavily with the environment, we can overlay this allegiance on the spectrum. Those texts on the far right of the spectrum would employ or engage with all three issues Heise outlines; that is, they include climate science, they are aware of cultural representations, and they involve a political dimension (whether that is reflected in the plot line, or is directed at engaging readers politically). Texts to the left of the spectrum may interact with the factors of the triple allegiance in varying degrees, whether they only involve a single factor or two factors. By using a continuum we can recognize how (if at all) dystopian literature has changed in its representations of the environment since the widespread acceptance of climate change. Such a continuum demonstrates that there was not a profound shift in theme after 1975; however, those texts written in the wake of climate change are more likely to reflect the triple allegiance. Table 1 lists the novels studied in chronological order (based on

publication date) and demonstrates which elements of the tripe allegiance they exhibit. This visual representation shows how earlier works typically only demonstrate a single element, whereas novels published later increase to two or three.

Table 1. “Triple Allegiance in Dystopian Novels”

	Scientific Study of Nature	Cultural Representations (of nature)	Political struggle for sustainability
<i>A Canticle for Leibowitz</i> 1959			X
<i>The Drowned World</i> 1962	X		
<i>The Word for World is Forest</i> 1972		X	X
<i>The Windup Girl</i> 2009	X		X
<i>Oryx and Crake</i> 2009	X	X	X
<i>The Year of the Flood</i> 2009		X	X
<i>MaddAddam</i> 2013		X	X
<i>The Water Knife</i> 2015	X	X	X

To briefly elaborate on Table 1, I will summarize how the features of Heise’s ‘triple allegiance’ are present in each novel. *A Canticle for Leibowitz*, being the earliest publication does not significantly engage with the environment; that being said, I would argue that it does argue for a more sustainable future, as Miller clearly warns readers against the instrumentation of nature by showing how it can lead to cycles of destruction (brought about by the development and re-development of nuclear weaponry). *The Drowned World* devotes significant space to the scientific study of nature; both of its protagonists are biologists set to map the new species and climate. Additionally, Ballard gives a scientific explanation of the solar flares that have led to

climate change in the novel; although not anthropogenically generated, Ballard still gives readers the science behind the climate change. Given the lack of culture in the novel, cultural representations of nature rarely come into play, although one could argue that the desire to drain the lagoons suggests a disinterest in the natural world. Finally, there is no struggle for sustainability; while Kerans wishes to protect the lagoon his methods are inherently unsustainable, as in becoming part of the lagoon he must necessarily die. Le Guin's *The Word for World is Forest* demonstrates both cultural representations of nature and the political struggle for sustainability. She demonstrates how two different cultures relate to nature, but primarily represents a western, instrumentalist/capitalistic viewpoint, in which nature exists solely as something to be commodified. The novel also involves the political struggle for sustainability, as it demonstrates the negative effects of deforestation, and represents the political struggle to stop environmental degradation within the plot-line.

The novels published after 1975, which might be called cli-fi or ecotopias tend to check off all three boxes. Both of Bacigalpi's novels react to climate change; this science is reflected in their plots through the science of genetic engineering or through water management in the face of drought. They both demonstrate cultural representations/understandings of nature. Like LeGuin's novel they demonstrate an industrial capitalist outlook whereby the natural world should be commodified. Finally, in reaction against such cultural representations they are involved in a political struggle for sustainable practices; this is reflected in the plots of both *The Windup Girl* and *The Water Knife*, and they are aimed educating readers about this struggle as well. The same can be said of Atwood's MaddAddam trilogy. Although different from Bacigalupi's work there are many similarities. Atwood's novels are also engaged with the science of climate change, although for the most part this knowledge is largely ignored by her

characters. Like *The Windup Girl* her novels also deal extensively with genetic engineering and the problems this instrumentalist/capitalistic approach can create for the environment. She is highly aware of cultural representations of nature, reflecting numerous cultural attitudes in her trilogy, from ignorance to protest to attempts to live sustainably; likewise, she also demonstrates the efforts of various political organizations ranging from the God's Gardeners to more radical groups. Like Bacigalupi's work Atwood's also seems determined to engage readers politically in the struggle for a sustainable future. The overarching theme in both these authors' works, as well as *The Word for World is Forest* is how capitalism is inherently at odds with a sustainable relationship with the natural world. Writing of *Oryx and Crake*, Murray claims that "the pigoon might as well be a thematic mascot for the novel, as nature itself has been reduced to one big commodity that's valuable only to the extent that it can be experimented upon and manipulated for human consumption and corporate profit" (115). Of course, the pigoons are unique to Atwood's trilogy; however, they could represent this theme in all of the modern dystopian novels examined.

Despite their differences there are several common themes shared between all of the novels examined. The first might be labeled 'the separation of humans and nature.' Each novel, ranging from Miller's *A Canticle for Leibowitz* to Atwood's *MaddAddam* demonstrate the falseness of this dichotomy, and point to the trouble that we can find ourselves in when we attempt to extricate ourselves from our environments. Today this attitude is recognized as belonging to environmentalism and ecocriticism, although it originated earlier with the emergence of New Wave Science Fiction. According to Ursula Heise:

Environmentalism and ecocriticism aim their critique of modernity at its presumption to know the natural world scientifically, to manipulate it technologically and exploit it

economically, and thereby ultimately to create a human sphere apart from it in a historical process that is usually labeled 'progress.' This domination strips nature of any value other than as a material resource and commodity and leads to a gradual destruction that may in the end deprive humanity of its basis for subsistence. Such domination empties human life of the significance it had derived from living with nature and alienates individuals and communities from their rootedness in place." (507)

This description is quite similar to the aim of New Wave sf, which "generally adopted an anti-technocratic bent that put it at odds with the technophilic optimism of ... hard SF, openly questioning if not the core values of scientific inquiry, then the larger social processes to which they had been conjoined in the service of state and corporate power" (Latham 107). Both Ballard's *The Drowned World* and Le Guin's *The Word for World is Forest* belong to the New Wave genre, reflecting not only this anti-technocratic bent, but also many of the characteristics of Heise's definition of modern day environmentalism or ecocriticism. Although in *The Drowned World* nature is not commodified, but is rather something to contend with and struggle against, Ballard emphasizes the alienation and depravity of the characters who are not in tune with nature. Kerans and Hardman are the only two characters who fully embrace the lagoon and seem to be the happiest in the novel. The lagoon gives their lives significance, as they are compelled to protect it and journey southwards to remain in its environment. Le Guin makes a similar commentary in *The Word for World is Forest*; the Athsheans who are one with their environment are a peaceful and content society until the 'yumens' arrive to deforest their planet in order to commodify the timber. Like Heise claims, the 'yumens' domination of nature leads to an unhealthy society; they do not have the ability to dream and rely on drugs and alcohol for comfort. Le Guin's novel also shows what happens to the Athsheans when their forest home is

destroyed; they become alienated from their culture and resort to violence, which had been previously unknown in their society. Although *A Canticle for Leibowitz* should probably not be deemed New Wave due to its infatuation with technology, we can recognize this theme through the monks' resistance to sharing their scientific knowledge with the secular scholars, for fear that it will be abused. Dom Paulo suggests to Thon Taddeo that man's use of nature should be governed in some way, suggesting the recognition that the environment should not be destroyed in the name of progress or profit.

Due to the era in which they were published, the works of Margaret Atwood and Paolo Bacigalupi are unlikely to be considered New Wave science fiction, and are more likely to be dubbed ecotopias or cli-fi. Cindy Pressley defines ecotopian fiction as containing images of a dystopian future which cannot be disconnected from a range of environmental issues (111). This genre shares many features with new wave science fiction, in addition to adhering to Heise's understanding of environmentalism and ecocriticism. This is especially true of Atwood's *MaddAddam* trilogy, in which the commodification of science and scientific developments are one of the primary dystopian elements. Like Latham writes of New Wave sf, Atwood is critical of the larger social processes that science has been conjoined with, as we see through the corruption rampant in the compounds where science takes place. This critique is present in many places in the trilogy, ranging from how HealthWyzer withholds antidotes to illnesses they develop to drive up profits, to the prevalence of careless genetic engineering in the series, which develops various environmentally detrimental 'invasive' species and allows parents to customize their children's genomes. While these New Wave style criticisms are less present in Bacigalupi's fiction it is clear that he too condemns the corporate ownership of scientific innovations, as we see through his critique of gene patenting in *The Windup Girl*. All this to say that although New

Wave SF developed before widespread awareness of global warming it shares many similarities with modern cli-fi. Additionally, it seems incorrect to claim that modern cli-fi arose solely in response to the environmental crisis, rather, it seems likely that its authors were influenced by the values purported by New Wave authors.

Regardless of their genre or the period in which they were written, the texts examined share some interesting similarities beyond simply engaging with environmental issues, such as their utopian desire for “Eden” and their commentary on the failures of techno-utopian solutions for environmental or social problems. Almost all of the novels considered make mention of Eden. Of course, while many dystopias reflect the failure of a utopian ideal (Booker 3), the garden of Eden is an interesting reference due to its environmental connotations. It is a paradise; full of unpolluted, abundant nature existing in harmony with its human inhabitants. Of course, the wording of the story of Genesis varies depending on which edition of the bible one reads; however, it is widely accepted that God gave humankind “dominion” over “the fish of the sea, the birds of the sky, the livestock, all the earth, and the creatures that crawl on the earth” (*HCSB: Digital Text Edition*, Genesis 1.26). Such language and attitude is reflected by many of the characters in these novels, who believe that the Earth was designed to be used and controlled by humans. In spite of, or perhaps because of this belief, the Garden of Eden is upheld as a utopian ideal throughout many of the novels.

A Canticle for Leibowitz is the most explicitly religious of the novels examined; it not only deals with a monastery but has become a classic within the “twentieth century renaissance of Catholic culture” (Wood 23). That being said, in Miller’s novel Eden is not only an out-of-reach paradise, but the idea of it in fact contributes to the dystopian elements of the novel. As Zerchi laments after the bombs have fallen, it is not suffering that is evil, but “the unreasoning fear of

suffering” and its “positive equivalent, the craving for worldly security, for Eden” that when combined as the sole goals of a society can lead only to their opposites: “maximum suffering and minimum security” (330). *A Canticle for Leibowitz* emphasizes the fundamental impossibility of re-creating Eden. Like in Genesis, in Miller’s novel the fall from Eden is due to the acquisition of knowledge. Humans are nothing more than “children... forever building Edens—and kicking them apart in berserk fury because somehow it isn’t the same” (Miller 246). The closer humanity comes to creating a paradise for themselves, “the more impatient they...[became] with it, and with themselves as well. They made a garden of pleasure, and became progressively more miserable with it as it grew in richness and beauty; for then, perhaps, it was easier for them to see that something was missing in the garden, some tree or shrub that would not grow” (Miller 288). Thus, the world becomes bitter because it “fell somehow short of half-remembered Eden” (Miller 332).

What is it that keeps humanity from re-creating Eden? Through the Brothers of the Order of Leibowitz, Miller seems to suggest that it is the knowledge of nuclear weapons. Like Eve who eats from the tree of knowledge of good and evil, wanting to become like a God, so the scientists and politicians in *Canticle* want to be like Gods, believing that “it was better for all to be destroyed than for the will of other princes to prevail... For the mighty of the Earth did contend among themselves for supreme power over all” (Miller 185), ultimately destroying the possibility of Eden as wars lead to constant cycles of nuclear annihilation. The novel ends on a strange note, suggesting the resurrection of innocence through Rachel, the second head of the tomato vendor Mrs. Grales, and with it the possibility of “the preternatural gifts of Eden” (Miller 336). However, we must take this resurrection with a grain of salt due to the cyclical nature of Miller’s novel. Can the continuation of human life on Earth result in Eden, or is humanity

doomed to repeat its fate?

The desire to create an Eden is also present in both *The Word for World is Forest* and *The Drowned World*. While in *Canticle* Eden seems to symbolize a place of paradise and lost innocence, in Le Guin's novel the desire for Eden is tied to the ability of man to exert control over his environment. In Genesis God tells Adam, "Be fruitful, multiply, fill the earth, and subdue it" (1.28); this is what Captain Davidson has in mind for Athshe, or New Tahiti, as he calls it. After humanity has over populated and over-farmed Earth, destroying its ecology, Davidson views Athshe as a place to replicate these practices, despite their failures on Earth. He believes that "New Tahiti, was literally made for men. Cleaned up and cleaned out the dark forests cut down for open fields of grain, the primeval murk and savagery and ignorance wiped out, it would be a paradise, a real Eden. A better world than worn-out Earth. And it would be his world" (Le Guin12). In Le Guin's work Eden is only a paradise for the men in power, while their Eden becomes hell-like for Athshe's native inhabitants.

Ballard's novel on the other hand does not so much express the desire to re-create Eden, as to return to it. He suggests that Eden-like conditions remain (or more accurately have returned with climate change and the resurgence of tropical jungle like conditions). Kerans is driven by his desire to re-inhabit such conditions; as the final paragraph of the novel concludes: "So he left the lagoon and entered the jungle again, within a few days was completely lost, following the lagoons southward through the increasing rain and heat, attacked by alligators and giant bats, a second Adam searching for the forgotten paradises of the reborn sun" (Ballard 198). Wagar explores Ballard's works through a utopian perspective, citing an interview that Ballard gave with Graeme Revell in 1983, in which he claims "the heroes even of the most extreme adventures...are driven by a dream of a perfectible world—a better world, in a moral sense—

where everything will make sense” (qtd. In Wagar 55). In Ballard’s work, Eden is not so much an external physical location, but can be achieved through an internal transformation. As Clarke writes, “if climate changes, we too must change...what action or response it requires is primarily internal and transformative...Kerans... [navigates his] way through Ballard’s formless zones of contact to be reborn as [a New Adam in a New Eden since he operates] on the level of the individual, for whom all climates cease to exist upon death” (16).

The three novels written prior to 1975 express varying conceptions of Eden. It is (1) an ideal— an irretrievable paradise lost to us due to our knowledge; (2) it is a place where humanity can exert total control over the environment; or (3) it involves a re-discovery of paradise on earth through personal transformation. I would argue that each of these three conceptions of Eden are also present in the novels published after the year 1975. Margaret Atwood’s MaddAddam trilogy deals primarily with the first and third type. It can be argued that Crake’s Paradise Project is ultimately born out of utopian ideals, despite the dystopia it results in. Even the name recalls the garden of Eden, if we take that as a paradise. Crake seems to espouse a stance similar to Dom Paulo in *A Canticle for Leibowitz*. Despite relying on science and his talent as a genetic engineer to develop a plague to eradicate humanity and to splice together the Crakers to take its place, Crake seems to recognize (perhaps more than most characters in the series), the havoc scientific knowledge can create if used irresponsibly. This knowledge prevents the achievement of Eden for humankind, but it does not prevent Crake from attempting to create Edenic conditions sans humanity. Thus, “Crake uses his technological genius to create a primitive, pre-technological, and tribal band of hominoids” (Bouson 349, “A Joke”).

Crake seems to be the only character in *Oryx and Crake* who recognizes the deep trouble that humanity finds itself in as a result of climate change. Although easy to attribute Crake’s

genetically engineered human-like Crakers to motives similar to Captain Davidson in the *The Word for World is Forest*-- that is a desire to exert his will on nature by genetically-altering it-- we can also read Crake's actions in different light. Bouson writes extensively on Crake and his morality, or if not morality at least his motives for wiping out humankind. Quoting Atwood herself, Bouson notes how "from a certain perspective...Crake's the most altruistic person around" (Atwood qtd. In Bouson 149 "It's Game Over"); he saw the destruction wrought on the planet by humanity, thus decided to eliminate humanity's harmful characteristics. As Crake sees it, by removing these features which he feels are responsible for "the world's current illnesses" (*Oryx* 305), the biosphere will stand a much better chance of survival, and there will be no wars or other societal ills. "For instance—racism...had been eliminated" and "hierarchy could not exist among [the Crakers], because they lacked the neural complexes that could have created it. Since they were neither hunters nor agriculturalists hungry for land, there was no territoriality" additionally, their foods were "plentiful and always available" and "they were perfectly adjusted to their habitat...they would have no need to invent any harmful symbolisms, such as kingdoms, icons, gods, or money" (*Oryx* 305). Crake ultimately aims to re-create Eden, where nature flourishes and his quasi-humans are primevally innocent.

Atwood's trilogy also suggests the need for a Ballardian shift in consciousness and behavior if we want to attain Eden in a time of climate change. This is reflected by both Crake and the God's Gardeners. Crake's behavior in *Oryx and Crake* recalls Kerans in *The Drowned World*; he is willing to die in order to arrive at his perception of paradise. Bouson writes, "in her account of the radical environmentalism of Crake and the God's Gardeners, Atwood draws on the philosophy of deep ecology...Deep ecologists, who argue that a paradigm shift is necessary because of the global ecological threat now confronting the planet, reject anthropocentrism ("A

Joke” 342-3). Crake presents one paradigm shift, and the Gardeners another, more palatable option.

The idea of inhabiting Eden is part of the Gardener practice, living, as they do, on the Edencliff Rooftop Garden. Like Ballard the Gardeners believe that Eden is already existing, it just requires some re-arranging to inhabit it; their garden was once a “sizzling wasteland” but has now “blossomed as the rose” allowing them to feed themselves with “unpolluted food in the bargain” (*Flood* 11). Eden in this case requires a reorientation of thought and action, embracing a minimalist, low-waste lifestyle, advocating for more sustainable ways, and preparing for the “waterless flood.” By embracing these values, Gardeners are granted living space in their beautiful garden, “with plants and flowers of many kinds” and “vivid butterflies” and “the vibration of bees” (*Flood* 43); a hidden Eden within the streets of the Pleeblands.

In both of Bacigalupi’s novels Eden seems to be defined as a place/state of humanity exerting control over nature, often for profit. The idea of Eden is introduced in the first pages of *The Windup Girl*, as Lake discovers the new fruit, *ngaw*. The resurgence of biological diversity brings to his mind a prophecy of the religious sect the Grahamites: ““*And he shall come with trumpets, and Eden shall return...*” (*Windup* 2). Tasting the fruit, he could “fall to his knees and give ecstatic thanks for the flavour of Eden’s return” (*Windup* 3). Although to some extent Lake associates the idea of Eden with abundant nature and biological diversity, to a greater extent it is tied to profits. As a generipper, he is not interested in biological diversity for its own sake, but rather as Donnelly writes, Lake’s “mystical reverence” for the *ngaw* “indicates commodity fetishism as a mechanism of capitalism” (163). Further, this “miraculous gift is imbued with the utopian potential of ‘Eden’s return’ and a religiosity which equates ‘miracles’ with ‘profits skyrocketing’” (Donnelly 163). Lake himself does not seem to have any religious inclinations,

but cannot help but refer to the Grahamite Bible when referring to genetic diversity. Like the authors examined here who rely on the religious and well known connotations of Eden, so too does Lake rely on this language to describe something that otherwise seems impossible. Looking at an old photograph from the time before the collapse Lake bemoans, “These dead men and women have no idea that they stand in front of the treasure of the ages, that they inhabit the Eden of the Grahamite Bible where pure souls go to live at the right hand of God. Where all the flavours of the world reside under the careful attentions of Noah and Saint Francis, and where no one starves” (*Windup* 64).

While Lake views Eden as something lost, the Grahamites who he cites so often believe that Eden can be restored, and that “it will take the knowledge of ages to accomplish it” (*Windup* 92). This view is similar to that espoused by Gibbons, the genehacker employed by the Thai Kingdom. His view is one of total control over the environment. He proclaims, “the world is ours. We are its gods....I could be your god and shape you to the Eden that beckons us” (*Windup* 243). Although Eden is not mentioned explicitly in *The Water Knife*, we can recognize a similar view in that novel. Water companies exert control over the environment through damming and covering rivers and lakes to reduce evaporation and control access. This novel also takes environmental control one step farther. Accepting that the perpetual drought of the desert is uninhabitable for humans, they create their own internal environments in the form of arcologies, veritable Edens for those who can afford to inhabit them. Like the *ngaw* in *The Windup Girl*, the arcologies are described in almost religious terms: “outside, there was only desert and death. But inside, surrounded by jungle greenery and koi ponds, there was life, and Catherine Case was a saint, offering salvation to her flock as she guided them to safety inside the technological wonders of her foresight” (*Water* 52). The water knife Angel describes Catherine Case as a saint,

although many others in the novel would not view her in such glowing terms, as she is responsible for cutting off many towns water, and essentially commodifying survival in the desert.

Although the novels examined share many similarities, including their fascination with Eden, I found they differ in their emphasis on the failures of techno-utopian solutions. In my first chapter I mention how political narratives about climate change fail to offer solutions for the problem we face, often suggesting its relative unimportance compared to issues like the economy. Imre Szeman has created three categories for describing popular political narratives regarding climate change; my thesis has focused predominantly on the third—that is, apocalyptic environmentalism, which suggests that social and political change is required to address climate change. Sensing that change is unlikely, like dystopian literature, apocalyptic environmentalist discourses seek to “modify behaviour and transform the social” (Szeman 64). I want to turn now to another category of discourse coined by Szeman: techno-utopianism.

Unlike apocalyptic environmentalism, which is a primarily didactic form of narrative or rhetoric, techno-utopianism “remains committed to capitalism” (Szeman 63). Techno-utopian discourses address the looming end of oil and effects of climate change by looking “to science and technology to develop energy alternatives that will mitigate [these effects]” (Szeman 60). If it seems odd to be concerned about techno-*utopias* in a work about dystopian literature, we should not be misled by the terminology here, for what Szeman has in mind is “the ‘bad utopia’ of future dreamscapes and fanciful political confections...a projection of an alternative future that is, in fact, anything but a ‘conception of systematic otherness’” (Jameson qtd. In Szeman 61). In this discourse, new technologies are integrated seamlessly into the workings of a capitalist economy, and life continues business as usual. Like Szeman himself, many of the

novels examined demonstrate the fallacy of such a discourse, and reiterate the need for social change in the face of the climate crisis.

If older novels touch on this theme, which I will call the failure of techno-utopian solutions, it becomes much more predominant in recent dystopian novels, such as Atwood's and Bacigalupi's. The emphasis of this theme seems to be the greatest difference between the novels examined from before and after the year 1975. In fact, I would argue that the failure of techno-utopian solutions is the predominant theme in both *The Windup Girl* and *The Water Knife*. In both of Bacigalupi's novels new technological solutions are developed to allow the continuation as business as usual (the kink-springs and genetically engineered crops, and the arcologies respectively). *The Windup Girl* is the novel that best demonstrates the fallacy of such discourses, and shows readers how such solutions are 'bad utopias;' by not being 'systematically other', as Bacigalupi's novel demonstrates, they can easily turn dystopian. To reinforce this commentary, Bacigalupi shows us that the failure of such solutions is not a one-off; his novel employs two such solutions: the kink-spring, and genetically engineered crops.

The king-springs in Bacigalupi's fiction are developed in order to address the lack of oil. The past, when oil was used freely to fuel travel and light and heat buildings is referred to as the Expansion, and is spoken of in almost mythic terms. In "The Calorie Man," the short story precursor to *The Windup Girl*, Lalji reflects on an AgriGen executive's "almost sexual yearning" for the global trade of the past, almost getting caught up in her vision himself, of a "company that pulled energy from the remotest parts of the planet and sold it far away within weeks of extraction; a company with customers and investors on every continent" ("Calorie" 13). The development of kink-springs should allow for re-expansion; if the technology Lake's corporation is trying to develop succeeds, it will revolutionize transport. The world hasn't seen such portable

energy since gasoline (*Windup* 5). However, the factory encounters one set-back after another, ranging from the development of fungus in the algal baths to damaged infrastructure due to an escaped megodont, and is ultimately shut down due to breeding a new contagious disease.

Likewise, genetic engineering is seen as a way to reduce famine. However, despite the large investments by calorie corporations, like the kink-springs this new technology also ultimately fails. Crop failures are the reason for Lake's presence in the Thai Kingdom, as he attempts to discover solutions for the vulnerability of their monocrops. By the end of *The Windup Girl* Bacigalupi has demonstrated how neither of these solutions are tenable in the long term. The Kingdom still succumbs to rising sea waters and political unrest.

The Water Knife demonstrates similar failures, only in this novel the techno-utopian solutions are developed to conserve water. Like gasoline, water is a finite resource that's use was not properly planned or rationed, resulting in widespread droughts and attempts to conserve what little water remains, such as putting rivers "into straws" in order to reduce evaporation (*Water* 11) and using dams to build artificial lakes to control the flow of water, monopolizing access. Furthermore, the arcologies have technologies that can recycle up to 90% of water, making life possible in the desert for those who can afford residence.

Similar solutions are present in Atwood's MaddAddam trilogy. Like in *The Windup Girl* genetic engineering is featured prominently as a solution to questions of food security in the series, with quasi foods rising to prominence in the compounds as well as the pleebs. However, like in Bacigalupi's novels, these "solutions" are predominantly accessible to people in the compounds who can afford such genetically engineered foodstuffs, where people in third world countries must resort to selling their children, and people in the pleebs resort to quasi-foods like Secret Burgers, where "the secret...was that no one knew what sort of animal protein was

actually in them” and “the mea grinders weren’t 100 percent efficient; you might find a swath of cat fur in your burger or a fragment of mouse tail. Was there a human finger nail there once?”

(*Flood* 33).

The genetic engineering in Atwood’s novels, which may begin with benevolent aims, quickly becomes abused by scientists playing God, and ultimately causing increased damage to the environment. “It is [the] instrumentalism that underpins the science so often practiced in *Oryx and Crake* and the scientists’ belief in their own power leads them to abuse their responsibility by treating the natural world as a mere plaything- and in fact, the cane toads, snats, bobkittens and wolvoogs turn on their inventors and become a new kind of deadly vermin overrunning the North American landscape” (Vials 53). Additionally, this science is housed in and financed by the Corporations, whose Compounds are similar to Bacigalupi’s arcologies. Their housing and education are privatized, minimizing access for large swaths of the population. Additionally, they also have a privatized security corporation, the CorpSeCorps, whose reach extends to the pleeblands. This privatized security force does little to protect the poor who need their protection in the crime-rich pleeblands, but rather are only present to support Corp interests.

All of the techno-utopian solutions examined in modern dystopian literature ultimately create and reinforce societal inequalities by employing what Naomi Klein has termed disaster capitalism. Disaster capitalism is a process that takes advantage of some sort of disaster to push neoliberal agendas and privatization, while the population is too shocked to resist, or may be pushed by foreign countries offering aid. As Klein puts it, “people spontaneously started using ‘disaster capitalism’ to describe what was happening...because it was so clear that disaster was being harnessed to push through a radical vision of totally unrestricted markets” (qtd. in Rooney). This is primarily evident in both of Bacigalupi’s novels, in which water and calories

are commodified and privatized, making them unaffordable to many in the disaster struck areas. We can also view the development of the arcologies in Bacigalupi's and the compounds in Atwood's fiction in drought struck cities in a similar light. When asked which example best describes disaster capitalism, Klein points to the re-development of New Orleans after Hurricane Katrina;

So here you have a disaster that was created by this very ideology. And then you have billions of dollars liberated in the name of the victims of this tragedy and suddenly there's a possibility for parents and teachers ...to build the system they've always wanted, to build the housing projects that they've always wanted, and to heal from this shock by being a participant in the reconstruction. Instead of that, the trauma was actively exploited and the fact that people had been spread all over the country and separated from their families and their roots and their communities was taken advantage of, in order to turn New Orleans into this Petri dish for ideas that live in think tanks (qtd. In Rooney).

Displaced from their homes when the water ran dry, most people in *The Water Knife* are forced to live in slums or to try to cross the border northward. However, for those who can afford them, the arcologies have been developed by private companies where thanks to "A/C and industrial air filters and 90 percent water recycling, life could still be good, even in Hell" (*Water* 349). While we get less background in *Oryx and Crake* about the development of the Compounds, we learn that "increasingly, middle-range execs and the junior scientists lives there too...because nobody had to commute to work...Despite the sterile transport corridors and the high-speed bullet trains, there was always a risk when you went through the city" (*Oryx* 27). The cities (pleebands) are unsafe, whether due to higher crime rates or increased risk of disease, and those who can afford to do so avoid them. Like Klein states, the disasters in these modern dystopian novels have been

created by the ideology that continues to profit from them. As addressed in the third chapter, all of these technologies are recognized as problematic, however short term gain eclipses the threat of long term disaster.

Contrary to my expectations, I did not find a clear-cut distinction between dystopian novels written before and after “global warming” was coined in 1975. I suggest instead that such novels should be viewed along a continuum, ranked based on their engagement with the scientific, political and cultural representations of climate change. The most significant difference I found between these sets of novels was how they engage with the ideas and rhetoric of techno-utopian solutions to climate change and its associated issues. It seems that with the increasing popularity of this rhetoric and the proposals for such solutions, representations of such solutions have become more widespread in dystopian literature, as authors seek to demonstrate how such solutions can ultimately only fail in the long-term, as they are premised upon the same systems that have led to current problems.

The primary reason I was interested in this research was because of my interest in how the general population interacts with the climate crisis. Is it something that they are concerned with? Or is it something that is relatively easy to ignore, given the tendency for politics not to reflect the urgency of the crisis, and its desire to perpetuate the status quo? I wondered about the benefits of engaging readers with these ideas through a fictional medium, and whether through the use of defamiliarization the urgency of the crisis and the need for societal change might be reinforced. In this regard I did note a difference between the modern novels I examined and those written prior to the discovery of global warming. These novels are much more engaged with Heise’s political dimension of the “triple allegiance” both in terms of their plots, and in how

their themes seem to be deliberately aimed to educate readers about the need for change in the current climate crisis. In a paper entitled “Climate Change Imaginaries? Examining Expectation Narratives in Cli-Fi Novels,” Whiteley, Chiang and Einsiedel find that “a pointed weakness in the environmental movement” is its inability to “portray a future on a planetary scale and to make connections between global threats and individual lives” (29). Enter climate fiction, which simultaneously develops a theoretical planetary future and demonstrates the impacts of such a future on individual lives. All of the novels written after 1975 achieve this aim. They create a future on multiple scales; while their stories are primarily localized to the lives of a few key characters, each novel also ensures readers have a picture of the global as well.

I chose to focus on dystopian novels due to their political nature, and asked whether in the absence of political narratives that meaningfully engage with issues of climate change, this void could be filled by popular representations of climate change in the form of dystopian science fiction novels. I was interested in whether “in the context of climate change... apocalyptic scenarios may still offer negative but plausible possibilities that may motivate change, enlist activism, or instill fear in a skeptical public” (Whiteley, Chang, Einsiedel 31). While these are hard to measure by a one-sided analysis of dystopian novels that does not engage readers, I found that the novels examined seem to have these actions as their goals. The novels written after 1975 (both Atwood’s and Bacigalupi’s) seem to want to motivate change by showing readers alternative ways of living during the climate crisis, ranging from Jaidee and Kanya’s rejection of foreign funding and influence (read disaster capitalism) in *The Windup Girl*, to Lucy’s unwavering fight to give Phoenix their rightful water rights in *The Water Knife*, to the God’s Gardener’s deep-ecological and religious retreat from a capitalist society hell-bent on making money without care for the environmental ramifications in the MaddAddam trilogy.

Climate fiction will not single handedly solve the climate crisis. However, it provides a manner for the average person to think through the climate crisis, and the impacts it will have on their life and their future. It is “self-consciously guided by an awareness of the social relationships of its own historical moment” and “envisions the developments of these relationships into the ‘not yet’” (Vials 238). By demonstrating this process of development, climate fiction can give readers hope that it is not too late for action; our futures are not quite guaranteed to be dystopian. It can also function to show readers how they can take action to mitigate some of the effects of climate change, as mentioned above. By “situating the climate change problem within the social as the novels do” the authors can represent the complexities of climate change in “ways far removed from temperature charts and other scientific ways of understanding climate change” (Whitely, Chiang, Einseidel 34); while people may be paralyzed by such scientific data, by demonstrating the social side of climate change (both how it will affect society, and how social changes can be implemented to mitigate its effects), such novels show readers people like themselves acting in this time of crisis. In *The Water Knife* Catherine Case explains there is a theory that says that “if we don’t have the right words in our vocabularies, we can’t describe the things that are right in front of our faces. If we can’t describe our reality accurately, we can’t see it” (Bacigalupi 59). Climate fiction can provide readers with such words, allowing them to see their realities, and hopefully their futures.

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