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**Article title:** Climate change in literature and literary studies: From cli-fi, climate change theatre and ecopoetry to ecocriticism and climate change criticism

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### Abstract

In the last five years, climate change has emerged as a dominant theme in literature and, correspondingly, in literary studies. Its popularity in fiction has given rise to the term cli-fi, or climate change fiction, and speculation that this constitutes a distinctive literary genre. In theatre, the appearance of several big-name productions from 2009 to 2011 has inspired an increase in climate change plays. There has been a growing trend, too, of climate change poetry, thanks to the rise of ecopoetry (poetry that exhibits ecological awareness and engages with the world's current state of environmental degradation) and the launch of some key climate change poetry initiatives in the media. This prevalence of climate change literature has brought about a greater engagement with climate change in literary studies, notably the environmentally-oriented branch of literary studies called ecocriticism. The increasing number of ecocritical analyses of climate change literature, particularly novels, is helping to shape a canon of climate change fiction. In a separate development, there has been greater interest in the phenomenon of climate change in literary or critical theory (the branch of literary studies concerned with literary concepts and philosophies rather than with literary texts). This development—centred on the study of climate change as a philosophical or existentialist problem—is sometimes termed climate change criticism or critical climate change.

### Introduction

In discussing climate change in literature and in literary studies, this article updates a 2011 article on the topic<sup>1</sup> and takes account of substantial subsequent developments in the field. Almost five years on from that initial review, it is clear that climate change is no longer a marginal topic in literature and literary studies. Climate change fiction, or cli-fi, has gained considerable public and critical attention. Climate change in literary studies, particularly in literary or critical theory, is also now

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being heralded as a discrete subfield of literary studies. This is more than just a matter of perception and of naming: there has been an actual increase in literary engagements with climate change, and literary scholars have been busy exploring both these texts and the concept of climate change as a cultural phenomenon.

I proceed in two broad sections. In the first of these, I deal with climate change in literature. I begin with climate change fiction, making a brief summary of the novels mentioned in the 2011 review and then taking account of novels published subsequently. I then move beyond fiction to climate change in drama and poetry, where some significant developments have occurred. In the second section, I deal with climate change in literary studies. (The distinction I make between literature and literary studies corresponds to the common division in literary scholarship of primary or literary texts on the one hand and secondary or critical discussions on the other.) I first deal with ecocriticism, that is, environmentally-oriented literary studies, and discuss the substantial increase in ecocritical analyses of literary texts about climate change, which is beginning to help shape what I call a canon of climate change literature. I then consider two ecocritical approaches to climate change literature: some ecocritics read climate change literature as helping us to understand how to live with climate change, while others suggest we should read them simply and objectively as a way of understanding the complexity of climate change as a cultural phenomenon. I end with a consideration of significant developments in literary theory or critical theory, that is, the more abstract branch of literary studies concerned with literary concepts and philosophies rather than with literary texts, in particular the critical movement sometimes termed climate change criticism or critical climate change.

### **The state of play in 2011**

In 2011, we set out to show that climate change had begun to register in the cultural imagination. Because of the paucity of climate change drama and poetry at the point, we focused on fiction. We took account of early science fiction that considered climatic concerns generally. We then charted climate change fiction from the first climate change novel in the 1970s through the 80s and 90s, mainly in science fiction. We also noted that climate change appeared as a theme in some political thrillers in the 1990s and first decade of this century. We demonstrated a recent emergence of climate-change-related novels by 'serious' or 'literary' authors, who tend to be published by well-known presses and receive mainstream media attention. In discussing literary studies or literary criticism, as distinct from literature *per se*, we dealt with recent engagements with climate change in literary or critical theory. We noted, in contrast, an apparent lack of such interest in those branches of literary studies that deal more directly with literary texts and less with literary concepts. We suggested that it was time ecocriticism took seriously the relationship between climate change and literature as a worthwhile topic of study, whether historical or contemporary. We proposed that a historically-oriented ecocriticism, what one might call an eco-historicism, could contribute much to such a venture.

## **CLIMATE CHANGE IN LITERATURE**

### **Fiction**

The novel is a ubiquitous literary form and the dominant one of our age. It should come as no surprise, then, that climate change fiction far outstrips poetic and dramatic engagements with climate change. Indeed, climate change fiction has been labelled cli-fi and identified as a genre of fiction in its own right.<sup>2,3,4</sup> However, in considering cli-fi as genre, one must consider the slippery character of literature—which is, after all, a human endeavour subject to human foibles—and thus one must remember that genre is fluid in nature. Many texts straddle generic boundaries, and

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genres themselves evolve over time. It is probably more accurate to identify climate change as a topic found in many genres, for example, science fiction, dystopia (themselves two genres given to much cross-fertilisation), fantasy, thriller, even romance, as well as fiction that is not easily identifiable with a given genre, for example, the social or psychological character studies favoured by mainstream authors such as Maggie Gee, Barbara Kingsolver, and Ian McEwan. In other words, climate change fiction names an important new category of contemporary literature and a remarkable recent literary and publishing phenomenon, though it is not necessarily a genre.

Just how prevalent is the phenomenon of climate change fiction? Trexler puts the figure at 150 or more.<sup>5</sup> However, this includes what he terms the ‘considerable archive of climate change fiction’,<sup>6</sup> that is, novels that are about climatic change phenomena generally. I would prefer to define climate change fiction as fiction concerned with anthropogenic climate change or global warming as we now understand it; with such a definition, the number may, of course, be lower but this is countered by the fact that it is still growing, and has grown since Trexler made his estimate. Indeed, Trexler and I implicitly assumed such a definition in 2011 when we identified Arthur Herzog’s *Heat* (1977)<sup>7</sup> as the first climate change novel and the point at which ‘the history of climate change fiction begins in earnest’.<sup>8</sup> With this as a starting point, we identified about thirty novels, most notably, science fiction such as George Turner’s *The Sea and the Summer* (1987),<sup>9</sup> Kim Stanley Robinson’s ‘Science in the Capital’ trilogy (2004, 2005, 2007)<sup>10,11,12</sup> and Paolo Bacigalupi’s *The Windup Girl* (2011),<sup>13</sup> with lesser known texts including Robert Silverberg’s *Hot Sky at Midnight* (1994),<sup>14</sup> Bruce Sterling’s *Heavy Weather* (1994),<sup>15</sup> and Norman Spinrad’s *Greenhouse Summer* (1999).<sup>16</sup> We also noted other genre fiction such as thrillers *Portent* (1993) by James Herbert,<sup>17</sup> *State of Fear* (2004) by Michael Crichton,<sup>18</sup> *Arctic Drift* (2008) by Clive Cussler,<sup>19</sup> and *Ultimatum* (2009) by Matthew Glass.<sup>20</sup> We then identified an emerging trend of what might be called highbrow or literary climate change fiction, starting with Gee’s *The Ice People* (1998)<sup>21</sup> and *The Flood* (2004),<sup>22</sup> Doris Lessing’s *Mara and Dann* (1999)<sup>23</sup> and *The Story of General Dann and Mara’s Daughter, Griot and the Snow Dog* (2005),<sup>24</sup> and T. C. Boyle’s *A Friend of the Earth* (2000),<sup>25</sup> and becoming a noticeable phenomenon in this century with Margaret Atwood’s *Oryx and Crake* (2003)<sup>26</sup> and *The Year of the Flood* (2009),<sup>27</sup> Will Self’s *The Book of Dave* (2006),<sup>28</sup> Sarah Hall’s *The Carhullan Army* (2007),<sup>29</sup> Jeanette Winterson’s *The Stone Gods* (2007),<sup>30</sup> and John Wray’s *Lowboy* (2009).<sup>31</sup> We also considered the attention being paid to climatic concerns in Cormac McCarthy’s *The Road* (2006),<sup>32</sup> though I would note here that the book never names the cause of its climate catastrophe and therefore does not deal with anthropogenic climate change *per se*: one could label it a climate change novel in effect if not in intent. Our review culminated with the then recent publication of Ian McEwan’s *Solar* (2010).<sup>33</sup>

In this updated review, I will focus on mainstream fiction—novels that have been well received in critical and/or popular terms—rather than enumerate more obscure instances and vanity publications. This is because of the sheer number of climate change novels now extant. Indeed, this is common practice in literary studies, which cannot account for the vast majority of novels constantly published worldwide and must perform some kind of selection on the basis of value, whether that value is perceived to be intrinsic (due to literary merit) or extrinsic (due to socio-cultural influence).

What is most striking in any discussion of climate change fiction is the considerable increase over the past five years. This may have to do with the publicity that surrounded the appearance of McEwan’s novel as one of the best known authors thus far to attempt climate change fiction.<sup>34,35,36</sup> Since then, there have appeared about twenty or so climate change novels that have gained significant critical and public attention. Many of these may be categorised as dystopian (broadly definable as the depiction of a negative or undesirable future, as opposed to the utopian depiction of positive and desirable futures) or post-apocalyptic (broadly definable as the depiction of a future

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created by an apocalyptic event). Obviously, there are overlaps between the two, as many post-apocalyptic futures are also negative and therefore dystopian, but the post-apocalyptic tends to focus on the immediate effect of catastrophe. Recent dystopian and/or post-apocalyptic climate change narratives include: James Miller's *Sunshine State* (2010);<sup>37</sup> Robert Edric's *Salvage* (2010);<sup>38</sup> Peter Heller's *The Dog Stars* (2012);<sup>39</sup> Nathaniel Rich's *Odds against Tomorrow* (2013);<sup>40</sup> Jane Rawson's *A Wrong Turn at the Office of Unmade Lists* (2013);<sup>41</sup> and Karl Taro Greenfeld's *The Subprimes* (2015).<sup>42</sup> In such grim futuristic scenarios, climate refugeeism becomes an obvious theme. This is the case in *Things We Didn't See Coming* (2009) by Steven Amsterdam,<sup>43</sup> *Lighthouse Island* (2013) by Paulette Jiles,<sup>44</sup> *The Swan Book* (2013) by Alexis Wright,<sup>45</sup> *Shackleton's Man Goes South* (2013) by Tony White,<sup>46</sup> *California* (2014) by Edan Lepucki,<sup>47</sup> and *On Such a Full Sea* (2014) by Chang-Rae Lee.<sup>48</sup> Mention must be made too of Atwood's *MaddAdam* (2013),<sup>49</sup> the much-awaited final instalment in a dystopian series that includes *Oryx and Crake*<sup>26</sup> and *The Year of the Flood*<sup>27</sup> and is now commonly known as the MaddAdam trilogy, and *The Collapse of Western Civilisation* (2014), a scientifically accurate work of science fiction by historians of science Naomi Oreskes and Erik M. Conway.<sup>50</sup> Other notable science fiction novels set in future climate-changed worlds include *The Peripheral* (2014) by steampunk writer William Gibson<sup>51</sup> and follow-up novels by Bacigalupi.<sup>52,53</sup> Again, there is overlap between science fiction, dystopia and the post-apocalyptic, with the emphasis in science fiction being on an imaginary but internally consistent world characterised by its scientific and technological processes.

A small number of recent climate change novels are set in the present: such texts include J. M. Ledgard's *Submergence* (2011)<sup>54</sup> and Barbara Kingsolver's *Flight Behavior* (2012).<sup>55</sup> Ledgard's work could be characterised as postmodern for its innovative style and fragmented, inward-looking narratives: it juxtaposes two lovers' estranging and alienating experiences with war and climate change. Kingsolver's more conventional and realist *Flight Behavior* presents a young woman's unexpected encounter with the scientific and moral demands of climate change, as she deals with an ecological disaster in her back yard. Also worth considering is James Bradley's *Clade* (2015), which takes a long view of climate change in the lives of one family across several decades, ending with the near future.<sup>56</sup>

There has emerged, too, a range of climate change novels outside the Anglophone world. The majority of these are German. Goodbody<sup>57,58</sup> provides useful lists of these, starting with Anton-Andreas Guha's *Der Planet schlägt zurück* (*The Planet Strikes Back*, 1993).<sup>59</sup> Best-sellers include Frank Schätzing's *Der Schwarm* (*The Swarm*, 2004),<sup>60</sup> translated in 2006, and Ilija Trojanow's *EisTau* (*Melting Ice*, 2011).<sup>61</sup> Other key works are: Dirk C. Fleck's trilogy of *GO! Die Ökodiktatur* (*GO! The Eco-dictatorship*, 1993),<sup>62</sup> *Das Tahiti-Projekt* (*The Tahiti Project*, 2008),<sup>63</sup> and *Maeva!* (2011);<sup>64</sup> Liane Dirks's *Falsche Himmel* (*False Skies*, 2006);<sup>65</sup> Christian Kracht and Ingo Niermann's *Metan* (*Methane*, 2007);<sup>66</sup> Klaus Lehrer's *Natürlich grausam* (*Naturally Cruel*, 2008);<sup>67</sup> Ulrich Hefner's *Die dritte Ebene* (*The Third Level* 2007);<sup>68</sup> Helmut Vorndran's *Blutfeuer* (*Bloodfire*, 2010);<sup>69</sup> and Nele Neuhaus's contrarian conspiracy thriller *Wer Wind sät* (*He Who Sows Wind*, 2011).<sup>70</sup> Trexler<sup>71</sup> notes a number of climate change novels that have been translated into English from other languages: the Dutch *Tongkat* (*Tongue Cat*, 1999) by Peter Verhelst,<sup>72</sup> translated in 2003;<sup>73</sup> *Slottet i Pyreneene* (*The Castle in the Pyrenees*, 2008)<sup>74</sup> by the Norwegian author Jostein Gaarder, translated in 2010;<sup>75</sup> *Auðnin* (*The Desert*, 2008)<sup>76</sup> by Icelandic novelist Yrsa Sigurðardóttir, translated as *The Day is Dark* in 2011;<sup>77</sup> the Finnish *Ennen päivänlaskua ei voi* (*Not Before Sundown*, 2000)<sup>78</sup> by Johanna Sinisalo, translated as *Troll* in 2004;<sup>79</sup> *El ángel perdido* (*The Lost Angel*, 2011)<sup>80</sup> by Spanish writer Javier Sierra, translated in 2011;<sup>81</sup> to which I would add the Finnish *Parantaja* (*The Healer*, 2011) by Antti Tuomainen,<sup>82</sup> translated in 2013.<sup>83</sup>

In surveying such fiction, one is struck by the range of uses to which climate change is put as an imaginative device. Nonetheless, some general trends can be discerned. The distinction I have

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made between present-day and futuristic settings is pertinent here. In some novels, usually those with contemporary or very near-future settings, climate change is a phenomenon that requires individuals' engagement as a political, ethical, or even psychological problem. For example, climate change emerges as a complex political problem demanding just as complex solutions for the scientists of Robinson's *Science in the Capital* trilogy<sup>10, 11, 12</sup> and the politicians of Glass's *Ultimatum*.<sup>20</sup> It figures as a profoundly personal ethical dilemma for the protagonists of Boyle's *A Friend of the Earth*<sup>25</sup> and McEwan's *Solar*,<sup>33</sup> an environmentalist and a scientist, respectively. It is the prime cause of psychological anxiety and delusion for the vulnerable adolescent protagonist of Wray's *Lowboy*.<sup>31</sup> The trend toward exploring the ethical or existentialist dimensions of climate change in the present continues in Ledgard's<sup>54</sup> and Kingsolver's<sup>55</sup> novels. Ledgard and Kingsolver both introduce scientists as significant characters and detail their emotional engagement with the problem of climate change. Indeed, in many of these novels, the problem of how we deal with future generations is a prominent theme, figured by the parental concerns of many protagonists. These include Kingsolver's protagonist Dellarobia Turnbow and Boyle's Ty Tierwater, as well as—in a negative example—McEwan's Michael Beard, whose selfishness as a father chimes with his failure to act altruistically on climate change.

As I have indicated, however, overwhelmingly, climate change appears in novels as part of a futuristic dystopian and/or post-apocalyptic setting. In such novels, climate change is depicted not just as an internal or psychological problem but for its external effects, often as part of an overall collapse including technological over-reliance, economic instability, and increased social division. This is not to say that such novels fail to deal with climate change's psychological or political ramifications but to show that they emphasise its physical dramas over its emotional or mental ones. Often, then, the difficulty of survival becomes a dominant theme. Once again, it should be noted that many of these novels register the importance of intergenerational obligation in order to survive climate devastation, for example, the depiction of fathers attempting to save their sons in McCarthy's *The Road*<sup>32</sup> and Gee's *The Ice People*<sup>21</sup> and the alignment of motherhood with environmental consciousness in Hall's *The Carhullan Army*<sup>29</sup> and Winterson's *The Stone Gods*.<sup>30</sup>

It should also be noted that a small number of novels—futuristic or not—approach climate change in a satirical mode, in a similar manner to the Ben Elton novels previously noted in 2011.<sup>84</sup> McEwan's *Solar*<sup>33</sup> is probably the best known satirical treatment of climate change, centring as it does on the flawed and unlikeable physicist Beard, who functions as an everyman (a representative of humankind) but represents us at our selfish worst. Other notable instances of satire include Atwood's use of parody in the MaddAdam trilogy,<sup>26, 27, 49</sup> Rawson's light-hearted depiction of the future,<sup>41</sup> and Greenfeld's darkly comic mocking of American neoliberalism in *The Subprimes*.<sup>42</sup>

## Drama

In the first decade of this century, playwrights and directors made relatively low-profile forays into climate change concerns. Notable earlier works include *The Weather* (2004), British poet Clare Pollard's first play and an earnest study of character psychology and climate inaction;<sup>85</sup> *The Ice-Breaker* by American playwright David Rambo, first performed in 2006, which charts environmental anxiety and sexual tension between two climatologists;<sup>86</sup> *We Turned on the Light*, a choral work by Orlando Gough with a libretto by British dramatist Caryl Churchill<sup>87</sup> that was performed at the BBC Proms in 2006;<sup>88</sup> Stephen Sewell's *It Just Stopped*, a play first performed in 2006, about two couples and their contrasting attitudes to global crises such as climate change;<sup>89</sup> UK dramatist John Godber's *The Crown Prince*, performed in 2007, a dystopian black comedy set in a devastated Hull;<sup>90</sup> Andrew Bovell's *When the Rain Stops Falling*, first performed in 2008, a tale of one family's internal conflicts across a climate-changing present and future, and winner of several awards in Bovell's native Australia;<sup>91</sup> and Canadian playwright Nicolas Billon's prize-winning *Greenland* of 2009, a comparison

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of familial rift with glacial drift.<sup>92</sup> Also worth noting is the lyrical one-man-show *The Word for Snow* by Don DeLillo, commissioned and performed in 2007 by the much-respected Steppenwolf Theatre Company in Chicago.<sup>93</sup> It was reprised in London in 2012<sup>94</sup> and published in 2014.<sup>95</sup>

The appearance of Steve Waters's *The Contingency Plan* (2009)<sup>96</sup> was a watershed in climate change theatre. The work is a set of two plays—a double bill—that share the same characters and themes. In the first, *On the Beach*, two scientists, father and son, are helpless to act on their dire meteorological predictions; in the second, *Resilience*, the son is similarly stymied when he turns to politics. In both plays, frustration turns to disaster when much of the UK is devastated by floods. The play was critically acclaimed, with Waters praised for making 'the most important issue of our times into engrossing theatre'.<sup>97</sup> In the wake of Waters's work, several high-profile climate-change-themed plays appeared in the UK. In 2010, *Earthquakes in London* by Mike Bartlett<sup>98</sup> premiered at the National Theatre and received positive reviews for its depiction of a climate scientist and the effects of his apocalyptic warnings on his three daughters.<sup>99</sup> 2011 saw the premieres of three major dramatic works about climate change. Richard Bean's *The Heretic* (2011) is sympathetic to scientists' ethical burdens but takes a comedic and satirical stance toward academic bureaucracy and data cherry-picking.<sup>100</sup> Turning from science to psychological matters, *Wastwater* (2011) by Simon Stephens hints darkly that human nature is incapable of caring for the environment.<sup>101</sup> The most controversial of the year's climate change plays was *Greenland* (2011) by Moira Buffini, Matt Charman, Penelope Skinner and Jack Thorne.<sup>102</sup> The play's four writers were engaged to write it by the National Theatre; their separate plots, mostly dealing with the ethical dilemmas faced by climate scientists and activists, were co-ordinated by director Bijan Sheibani. However, critics complained, for example, that the 'NT ha[d] commissioned four playwrights [...] to cobble something together'<sup>103</sup> and that the play 'lack[ed] focus'.<sup>104</sup>

Despite these mixed reviews, these plays constitute a significant point in climate change and theatre, for they went on to inspire a trend not just in the UK but around the world. In 2012, following her experience directing *Wastwater*, Katie Mitchell collaborated with computational scientist Stephen Emmott on a theatrical lecture called *Ten Billion*,<sup>105</sup> subsequently published by Emmott as a book,<sup>106</sup> and two years later attempted a similar theatre-lecture hybrid, *2071* (2014), with playwright Duncan Macmillan and climatologist Chris Rapley.<sup>107</sup> Other notable new and critically-acclaimed productions include two more Australian plays, Ian Meadows's *Between Two Waves* (2012), about a government climatologist distraught at the future confronting his unborn child,<sup>108</sup> and Stephen Carleton's *The Turquoise Elephant* (2014), which imagines some surreal ecological impacts in Canberra,<sup>109</sup> as well as American novelist and playwright Gordon Dahlquist's *Tomorrow Come Today* (2014), set in a science-fictional dystopian future.<sup>110</sup>

As these brief descriptions of these plays and their plots might indicate, there are two characteristics of climate-change-themed theatre. First, it usually refers to a disastrous climatic event, either depicting such an event dramatically or setting the action in its dystopian aftermath. Second, it often deals with the psychological implications of climate change, from the ethical and political challenges faced by climate scientists to the anxieties experienced by scientists and non-scientists alike as they consider the impact on their loved ones. Indeed, Waters's work combines both concerns, not just depicting an apocalyptic event but also exploring the personal challenges of climate change. Since Waters's work and the other plays of 2010 and 2011, it appears that the theme of how individuals, especially scientists, must grapple with the public and private dilemmas wrought by climate change has continued to preoccupy dramatists and theatre-goers alike. As is the case with climate change fiction, some of these plays specifically frame personal engagement with climate change in terms of intergenerational relationships: witness the scientist fathers (and they are usually fathers) of *The Contingency Plan*,<sup>97</sup> *Earthquakes in London*,<sup>99</sup> and *Between Two Waves*.<sup>108</sup>

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## Poetry

Any account of the poetry of climate change must consider its roots in the contemporary genre of ecopoetry, itself a development from nature poetry more generally (which, in the western literary canon, is a long-established tradition from classical pastoral to Renaissance versions of pastoral, eighteenth-century landscape poetry and Romantic celebrations of nature). Ecopoetry, however, can be distinguished from traditional nature poetry by its emphasis on the inter-connectedness of human and nonhuman life in a time of unprecedented anthropogenic environmental damage. Writing in 1995, Gifford notes of what he calls 'green poetry'<sup>111</sup> that it is 'part of a wider social concern with the future of our planetary environment that has demanded a re-examination of our relationship with the natural world'.<sup>112</sup>

Ecopoetry—more or less synonymous with Gifford's 'green poetry'—became more widely recognised as a genre of poetry around the start of this century, with the appearance of two important avenues for publishing ecopoetry. The *Ecopoetics* journal was founded in the US in 2001, explicitly seeking to 'take on the "eco" frame, in recognition that human impact on the earth and its other species, is without a doubt the historical watershed of our generation'.<sup>113</sup> In 2002, the British environmentalist magazine *Resurgence*, active since the 1960s, drew attention to itself as an outlet for ecopoetry by bringing out an anthology of such poems previously published in the magazine, and recognising that 'many of our best poets are giving voice to what must be the greatest issue of our time: *the continuing violation of the natural order and its catastrophic effect on all of life*'.<sup>114</sup> Around this time, too, a pioneering collection of critical essays on ecopoetry appeared.<sup>115</sup> It helped to identify US poets Wendell Berry, Linda Hogan, W. S. Merwin, Mary Oliver, and Gary Snyder as prominent ecopoets. Its editor contextualised the collection by referring to 'problems such as overpopulation, species extinction, pollution, global warming, and ozone depletion appear[ing] almost daily in national headlines'<sup>116</sup> and defined ecopoetry as a 'subset of nature poetry that ... takes on distinctly contemporary problems and issues'.<sup>117</sup>

With its interest in understanding humankind's place in the web of life, the new field of ecopoetry thus offers itself as an avenue and impetus for poets to write about climate change. This is evident in several recent anthologies. The British anthology *Earth Shattering* attempts to present 'an ecopicture of the whole earth in all its diversity exposing the many ways in which the very fabric of our living planet is being torn apart'.<sup>118</sup> It devotes a section, 'Force of Nature', to poems that, among other things, show 'the effects of global warming and climate change on nature and on people's lives'.<sup>119</sup> These include Fleur Adcock's 'The Greenhouse Effect',<sup>120</sup> Helen Dunmore's 'Ice Coming',<sup>121</sup> Robert Hass's 'State of the Planet',<sup>122</sup> Simon Rae's 'One World Down the Drain',<sup>123</sup> Jane Hirshfield's 'Global Warming',<sup>124</sup> and John Powell Ward's 'Hurry Up Please, It's Time'.<sup>125</sup> It also includes work originally commissioned by the insurance syndicate Lloyd's and the London charity Poet in the City for their 2007 Trees in the City initiative,<sup>126</sup> such as Patience Agbabi's 'Indian Summer',<sup>127</sup> John Burnside's 'Certain Weather',<sup>128</sup> and Matthew Hollis's 'The Diomedes'.<sup>129</sup> Another British collection, *Entanglements*, purports to reflect 'this specific time of transition: the transition from a world in which global ecological damage is just one issue amongst many, to a world in which our species' relationship with the global ecosystem is *the issue*'.<sup>130</sup> Most of its poems deal generally with global environmental crisis rather than with climate change in particular, with the exception of Allen Tullos's 'Data Points Cloud the Event Horizon', with its reflections on global weather patterns.<sup>131</sup> Another important anthology is *Facing the Change*,<sup>132</sup> an American collection of essays, short stories and poetry about climate change, some of which had already been published elsewhere. Notable poems include Dane Cervine's 'The Last Days',<sup>133</sup> Barbara Crooker's 'Weather Weirder, 2012',<sup>134</sup> Diane Gage's 'Ursus Maritimus Horribilis',<sup>135</sup> Harry Smith's 'About the Weather',<sup>136</sup> and J. R. Solonche's 'Polar Bears'.<sup>137</sup>

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<http://onlinelibrary.wiley.com/doi/10.1002/wcc.385/abstract;jsessionid=C53B2A854D11E5A1097CD60ECF6F66F.f03t03>. This article may be used for non-commercial purposes in accordance with the Wiley Self-Archiving Policy [<http://olabout.wiley.com/WileyCDA/Section/id-820227.html>].

The chief characteristic of an anthology is its attempt to gather together a coherent selection of sometimes previously published work. Some influential poems about climate change have appeared independently of ecopoetry or climate change poetry anthologies. Ruth Padel's 'Slices of Toast' (2007)<sup>138</sup> has been singled out for praise as a climate change poem.<sup>139,140</sup> Derek Mahon's recent volumes, *Harbour Lights* (2005)<sup>141</sup> and *Life on Earth* (2008),<sup>142</sup> deal in part with climate change. In addition, two initiatives by the *Guardian* newspaper have yielded a number of important poems on climate change. In 2009, as part of its 10:10 campaign (referring to the need to cut emissions by 10% by 2010), the newspaper published Carol Rumens's '2084',<sup>143</sup> Kathleen Jamie's 'Spider',<sup>144</sup> and Andrew Motion's 'The Sorcerer's Mirror'.<sup>145</sup> These were specially commissioned, with the exception of Motion's contribution, which was a series of sonnets written for Cambridge University and to be set to music.<sup>146</sup> In 2015, the newspaper followed this up by asking British poet laureate Carol Ann Duffy to curate 'Keep It in the Ground',<sup>147</sup> a set of twenty poems that appeared in its pages over twenty days and included pieces by Alice Oswald<sup>148</sup> and Simon Armitage,<sup>149</sup> which Duffy described as 'an anthology of poetry on climate change'.<sup>150</sup>

Looking across the poems mentioned here, it is possible to discern some prevalent approaches and themes, namely, the use of lyrical descriptions of nature and our place on the planet to promote ecological awareness, the striking of an elegiac or apologetic attitude over damage done (indeed, lament is by far the most dominant tone of climate change poetry), and the use of satire or jeremiad to criticise humans for their careless treatment of the world (satire refers to a mocking or comic invective and jeremiad to a solemn or dire one). Correspondingly, Bryson identifies three characteristics of ecopoetry: (1) 'an emphasis on maintaining an ecocentric perspective that recognizes the interdependent nature of the world', (2) 'an imperative toward humility in relations with both human and nonhuman nature', and (3) 'an intense skepticism concerning hyperrationality ... that usually leads to an indictment of an overtechnologized modern world and a warning concerning the very real potential for ecological catastrophe'.<sup>151</sup> One could say that these are refined thus when it comes to addressing climate change in poetry: there tends to occur (1) the representation of climate change as a prime example of humans' failure to recognise their impact on nonhuman species, (2) a tone of regret towards the nonhuman species of the present and to the humans of the future, and (3) a protest against human inaction on climate change.

## CLIMATE CHANGE IN LITERARY STUDIES

### Ecocriticism and the Canon of Climate Change Literature

The relative lack of engagement with climate change literature in the field of ecocriticism that was previously noted<sup>152</sup> is no longer the case. Analyses of literature, especially fiction, in the context of climate change have proliferated. Climate change now appears as a major strand in the regular meetings of ecocritical scholarly societies, such as the Association for the Study of Literature and Environment (ASLE) in the US, the Association for the Study of Literature and Environment in the UK and Ireland (ASLE-UKI), and the European Association for the Study of Literature, Culture and Environment (EASLCE). In the section that follows, I discuss ecocritical analyses of climate change novels, setting out their arguments and themes. As this discussion shows, although ecocritical studies of climate change literature serve a primarily analytical function, they also have a selective effect. As I have already indicated, judgements are inevitably made in literary studies about which texts bear closer scrutiny and analysis and, in this way, literary corpuses—or what are called canons in literary studies—are created. For better or worse, a canon of climate change literature, particularly climate change fiction, is now developing, with the novels of Gee, Kingsolver, McCarthy, McEwan, and Robinson emerging as key texts.

Trexler's *Anthropocene Fictions* is the first book-length study of climate change fiction.<sup>5</sup> It surveys a large number of climate change novels and aims to investigate their over-riding themes;



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even so, it necessarily restricts itself to close analysis of a select number of texts, including Crichton's *State of Fear*,<sup>18</sup> McEwan's *Solar*,<sup>33</sup> Glass's *Ultimatum*,<sup>20</sup> Bacigalupi's *The Windup Girl*,<sup>13</sup> Herzog's *Heat*,<sup>2</sup> Robinson's trilogy,<sup>10,11,12</sup> Turner's *The Sea and the Summer*,<sup>9</sup> Self's *The Book of Dave*<sup>28</sup> and Gee's *The Flood*.<sup>22</sup> Trexler argues that climate change has transformed our day-to-day experiences; in order adequately to represent these transformations, the contemporary novel has had to adapt existing formal conventions. Drawing on the deconstructive insights of Clark (detailed below), Trexler calls, too, for a new way of critiquing such novels, namely, an incorporation of Science and Technology Studies (STS) into ecocriticism and the development of what he labels 'eco-nomic criticism', a criticism that draws on the many 'senses of *eco*' and attends to the myriad dimensions of modern life.<sup>153</sup>

Other studies also consider climate change fiction as a reflection of the contemporary response to climate change; for example, Borm offers a relatively straightforward account of McEwan's *Solar*<sup>33</sup> as a satire of the different sides of the climate change debate.<sup>154</sup> However, most scholars, like Trexler, propose that contemporary understandings of climate change, far from being simply about debate, comprise a complex and peculiarly modern world-view. Squire<sup>155</sup> and Stark,<sup>156</sup> for instance, read McCarthy's *The Road*<sup>32</sup> as expressing an anxiety with, respectively, death and vision, anxieties that both argue are endemic to society in a time of climate change. An important trend in this regard is the suggestion by several studies that contemporary society's attitude to climate change is part of the increasingly dominant concept of risk. In this, they follow Beck's identification<sup>157</sup> of modern society as a 'risk society' (that is, as highly attuned to and organised in its potential response to the hazards and insecurities that might affect the individual) and Heise's influential application<sup>158</sup> of Beck's theory to literary criticism; most notably, Heise suggests that the concept of risk contributes to an increasingly global rather than local view of place. Thus, Mayer reads Kingsolver's *Flight Behaviour*<sup>55</sup> and Robinson's trilogy<sup>10,11,12</sup> as 'risk narratives', whose focus is on anticipating the risks of climate change rather than on its catastrophic aftermath.<sup>159</sup> Goodbody further proposes that novels such as Kingsolver's *Flight Behaviour*<sup>55</sup> and Trojanow's *EisTau*<sup>61</sup> shed light on public attitudes to climate change risk and scepticism.<sup>160</sup> Mehnert suggests that Amsterdam's *Things We Didn't See Coming*<sup>41</sup> is an example of a 'riskscape', that is, a view refracted through the lens of risk.<sup>161</sup> Elsewhere, Mehnert reads Fleck's *Maeva!*<sup>64</sup> as reflecting the kind of 'eco-cosmopolitan' worldview theorised by Heise.<sup>162</sup>

Some studies suggest that, in depicting contemporary social and cultural responses to climate change, climate change fiction brings important—and sometimes neglected—perspectives to the fore. Markley argues that Robinson's trilogy<sup>10,11,12</sup> 'asks us to take seriously the potential of science ... to foster new, expansive visions of humankind's co-implication in the natural world'.<sup>163</sup> In addition, there are studies that propose that some climate change novels contribute to a fuller understanding of climate change by highlighting often marginalised points of view, such as post-colonial (Maxwell)<sup>164</sup> and gendered (Johns-Putra)<sup>165</sup> perspectives.

Not all analyses of climate change fiction are positive in their evaluations. Some posit that a number of climate change novels ultimately preserve the political status quo that has so far proved ineffective in dealing with climate change. Hamming<sup>166</sup> and Kilgore,<sup>167</sup> while applauding Robinson's trilogy for confronting issues of race and gender, suggest that the novels could go further in challenging the bias in contemporary climate change scenarios toward white, male privilege. Garrard makes a much stronger critique of *Solar*,<sup>33</sup> arguing that McEwan implicitly defends the very Enlightenment values he should be satirising, since they have led to humans' environmentally destructive habits.<sup>168</sup> Notably, this critique is a follow-up to Garrard's initially positive, pre-publication review of *Solar*, a novel that he anticipated as a chance to explore whether or not humans have evolved sufficiently to do something about climate change.<sup>169</sup>

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The idea that the contemporary novel, in engaging with climate change, has itself undergone profound formal and generic innovation is a theme not just in Trexler's analysis but in several other studies that deal with the generic experiments that occur in climate fiction. Clarke's analysis of J. G. Ballard's *The Drowned World*<sup>170</sup> and *The Crystal World*<sup>171</sup> as fore-runners of climate change fiction, and as influential in their distinctive use of dystopia, is particularly relevant here.<sup>172</sup> Robinson's adaptation of utopian and dystopian genres to accommodate the theme of climate change in his trilogy<sup>10,11,12</sup> is discussed by Prettyman,<sup>173</sup> Johns-Putra,<sup>174</sup> and Cho,<sup>175</sup> Cho also provides a thoughtful account of Robinson's distinctive handling of novelistic time and space. In addition to utopian and dystopian traditions, climate change fiction draws on apocalyptic expectations; Wheeler's analysis of novels about the 'Anthropocene era', such as Gee's *The Ice People*<sup>21</sup> and *The Flood*<sup>22</sup>, discusses these novels' debt to religious eschatological writings.<sup>176</sup>

Ecocritical accounts of climate change have tended to focus on fiction to the detriment of drama and poetry. The main exception is Hudson,<sup>177</sup> who provides a comprehensive survey of climate change theatre. Also of note is Solnick,<sup>178</sup> who briefly mentions *The Contingency Plan*<sup>97</sup> and *Earthquakes in London*<sup>99</sup> as representations of the pessimism that can result from society's inability to act on climate change, and Woolley,<sup>179</sup> who references *Ten Billion*<sup>105</sup> before going on to discuss filmic representations of climate change. In addition, this relative lack may be being addressed by two developments. The first is the inauguration of a subset of ecocriticism termed 'ecodramaturgy', a term coined by May<sup>180</sup> and further developed by Arons and May.<sup>181</sup> The second—more directly concerned with climate change—is the emergence of 'ecotheatre', that is, 'theatre that would literalize and materialize the porousness and diversity of the ecological world',<sup>182</sup> combined with 'research theatre', in which the 'goal is not to use research to make theatre, but rather to use theatre to do research'.<sup>183</sup> These two concepts were brought together in Chaudhuri and Enelow's 'ecocide project',<sup>184</sup> one outcome of which was Enelow's climate change play *Carla and Lewis* (2014).<sup>185</sup>

Some ecopoetic scholarship has considered climate change in relation to poetry, usually in discussing which poetic conventions and theories might be most effective in capturing the uncertainty engendered by climate change. For example, Solnick discusses irony<sup>178</sup> and deconstruction<sup>186</sup> as important poetic tools, through readings of the poetry of Mahon and J. H. Prynne. Morton<sup>187</sup> and scholars influenced by him, such as Lilley,<sup>188</sup> refer largely to Keats's concept of negative capability (which one could define as a deliberate rejection of the ratiocinative or logical pursuit of answers) as a useful poetic approach to climate change. Griffiths discusses T. S. Eliot's radical ideas about poetic tradition as a reconceptualisation of individual agency that is pertinent to understanding climate change.<sup>189</sup>

### **Ecocriticism and the Role of Climate Change Literature**

Quite apart from their specific themes and perspectives, ecocritical analyses of literature's use of climate change may be broadly divided into two categories, which I characterise as normative or prescriptive on the one hand and objective or descriptive on the other. This is part of a larger debate currently rumbling through ecocriticism.<sup>190</sup> This concerns the question of whether ecocritical literary studies and scholars should play an active, even activist, role in educating or advocating on behalf of the environment, or whether they should maintain a conventionally objective stance and work to probe and reveal the complexities in the relationship between literature and the environment, a stance that some argue is—in its own way—profoundly educative and political.<sup>191</sup>

Thus, on the one hand, some ecocritical analyses promote literary representations of climate change as providing lessons to their readers on how to cope with, adapt to, or mitigate against climate change. Murphy suggests that climate change fiction encourages us to move from denial to 'recognition, acceptance, and the will to act'.<sup>192</sup> Rigby reads a selection of writers in traditions from

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European Romanticism to contemporary Australian Aboriginal literature for their invitations to ethical reflection that can help us confront catastrophe.<sup>193,194</sup> Similarly, Adamson analyses contemporary folk stories and finds that these offer ‘ecocritics and activists new tools’ for ‘making abstract, often intangible global patterns associated with climate change accessible to a wider public’.<sup>195</sup> Christensen too suggests that texts that ‘focus on the way the weather shapes the physical contexts, personalities, and destinies of their respective characters’ can help us live with weather and climate.<sup>196</sup> Many ecocritics, for example, Gabriel and Garrard<sup>197</sup> and Sitter,<sup>198</sup> have also focused on pedagogy, indicating that the role of the ecocritic includes teaching students about the dangers and complexities of climate change. In this vein, Cenkl describes how the work of poets of the Arctic regions has helped him and his students to understand changing lived experiences in a changing climate.<sup>199</sup>

On the other hand, there are those literary studies that seek simply to analyse the representation of the seemingly unrepresentable topic of climate change within literary conventions. Many such studies are motivated by the same theories that underpin climate change criticism or, indeed, have been influenced by the theorists working within climate change criticism. Trexler’s analysis<sup>5</sup> is such a study, drawing from work in STS and the theories of Latour<sup>200</sup> in order to explore how climate change fiction is part of the same network of things as the scientific and political discourses of climate change; in the process, he argues, the form of the novel itself has been reconfigured. In a comparable move, Baucom<sup>201</sup> invokes Chakrabarty’s argument<sup>202</sup> that the very concept of history has been profoundly challenged by climate change, and consequently argues that the historical novel too must respond to this challenge.

#### **Eco-historicism**

Two opposing tendencies may also be discerned in ecocritical studies of the representation of climate in historical texts, a brand of ecocritical scholarship that has become more common since we identified it in 2011 as a fruitful area of investigation into literature and climate change.<sup>203</sup> Scholars have followed Wood’s 2008 suggestion for developing an ‘eco-historicism’<sup>204</sup> with a call for greater interdisciplinary collaboration between ecocritics and environmental historians.<sup>191</sup> ‘Eco-historicist’ studies of climate change are concerned with the literary depiction of climate through history. They fall into the two broad camps discernible in contemporary studies of climate change literature—what could generally be called the prescriptive and the descriptive. There are, first, readings of historical literary texts as potentially educative documents for us living in a time of climate change. For example, Bartels<sup>205</sup> and Beckett<sup>206</sup> suggest that the ideas of William Morris and James Joyce respectively could provide modern readers with clues as to how to live with and understand climate change. In contrast, there are investigations of texts centred on the way they help reveal the cultural context of key moments in climate history. Kwiatkowska’s survey of medieval witchcraft literature,<sup>207</sup> along with Jonsson’s examination of eighteenth-century naturalist Pers Kalm’s travel journal,<sup>208</sup> shed light on milestones in the early modern understanding of climate as a global phenomenon. Meanwhile, Carroll’s<sup>209</sup> and Johns-Putra’s<sup>210</sup> studies of early nineteenth-century British literature show how texts written at the time of the Arctic ice-melt of 1818 were part of broader debates about the extent to which humans could affect climate.

#### **Climate Change Criticism**

I view the trend of climate change criticism in literary or critical theory as a separate development to ecocriticism. Although ecocriticism may be thought of as simply an umbrella term for the study of environmental issues in literature, it has in practice tended to serve as an identifier for only some—and by no means all—literary scholars working on environmental matters. Early ecocritics, in

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particular, often dealt with literary texts rather than with literary theory, and many ecocritical scholarly societies emerged in opposition to what they perceived as the anthropocentric concerns of the continental philosophies that underpin literary theory. Indeed, few of the theorists I go on to discuss here have identified themselves as ecocritics, though they have engaged with ecocritical forums and have recently begun to exert considerable influence on ecocritical scholarship.

Climate change criticism or critical climate change—a term introduced by McKee<sup>211</sup>—has mainly been formulated in essays in a number of special issues of literary theory journals over the past five years, including the *Oxford Literary Review*,<sup>212,213</sup> *Angelaki*,<sup>214</sup> *SubStance*,<sup>215</sup> *symplokē*,<sup>216</sup> and *Diacritics*.<sup>217</sup> These, along with the works I mention below, have helped to develop the field of climate change criticism.

Generally speaking, climate change criticism treats climate change in two ways. First, it scrutinises climate change as a cultural phenomenon using the conventional approaches of literary theory. These approaches, drawn from the broader realm of late twentieth- and early twenty-first-century continental philosophy, include deconstruction (inspired by Derrida),<sup>218</sup> analyses of power and discourse (in the style of Foucault),<sup>219,220,221</sup> or actor-network-theory (based on the work of Latour).<sup>222,223</sup> All such theories tend to emphasise the contingent, shifting, and slippery quality of concepts often taken for granted as factual or real: climate change is one such concept. However, theoretical treatments of climate change should not be confused with the kind of cultural relativism that would claim that anthropogenic climate change does not exist; rather, they usually argue that how climate change is understood is a result of a host of interlinked psychological, socio-cultural, political, and linguistic factors. Goeminne,<sup>224</sup> for example, subjects climate change modelling to a Latourian analysis to show how it is a matter of concern rather than a matter of fact, while Roelvink and Zolkos<sup>225</sup> examine the affective dimensions of climate change.

Second, climate change criticism sometimes suggests that the contingency and slipperiness that many literary theorists have long argued are part of a profound but unrecognised condition of our existence are now an unavoidable and undeniable part of our day-to-day lives, thanks to climate change. That is, climate change has turned what till now were simply theoretical or existentialist problems into lived experience. Thus, instead of scrutinising climate change, some literary theorists use climate change, along with the insights of literary theory, to scrutinise contemporary life, culture, and thought. In positing these arguments, many theorists have had recourse to the idea of the Anthropocene. While the term was first suggested by Crutzen and Stoermer<sup>226</sup> to suggest that human behaviour had affected the atmosphere to such an extent that it might be a discrete geological epoch, it was used in an influential essay by Chakrabarty as the descriptor for a profound historical shift.<sup>202</sup> Following Chakrabarty's argument that the 'geologic now of the Anthropocene has become entangled with the now of human history',<sup>227</sup> the Anthropocene has become useful in climate change criticism to signify not just how humans have become geological agents but how human destruction of both civilisation and environment has engendered an existentialist crisis and radically altered human ontology and epistemology, that is, our ways of being and knowing.

Much of the work of prominent exponents of climate change criticism falls into the second category. This is the case with many of the critiques inspired by deconstruction, for example. Deconstruction as a literary approach adopts the insights of Derrida<sup>218</sup> to reveal hidden and often contradictory meanings within texts. Broadly speaking, deconstruction in critical climate change is the recognition that climate change is itself a deconstructive force because it shows up the many inconsistencies in our cultural concepts. Clark has been one of the foremost advocates of such a position, suggesting, for example, that climate change has helped to deconstruct some of the anthropocentric assumptions at the heart of ecocriticism, for example, those to do with nature and beauty.<sup>228,229,230</sup> Other important theorists of climate change as cultural deconstruction are Cohen, who compares the philosophical challenge of climate change to an existentialist threat,<sup>231,232,233</sup> the

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much-respected Derridean scholar Miller, who uses the concept of climate change to deconstruct globalisation;<sup>234</sup> and Colebrook, who collaborated with Cohen and Miller on a deconstructive analysis of climate change.<sup>235</sup> Colebrook has since written much on climate change in the context of mass extinction.<sup>236,237</sup> Her work draws on several continental thinkers in addition to Derrida, from the psychoanalyst Lacan to the postmodern theorist Deleuze and the post-Deleuzian theorist Agamben, to show how the possibility of extinction has profound—usually ethical—implications for the category of human.<sup>238,239</sup> Finally, Morton, in a similar vein to Clark's deconstructive ideas, has suggested that the Anthropocene has challenged our ontological and epistemological foundations by revealing how the environment is not to be understood from any single subject position but is instead a 'mesh' of many objects.<sup>240</sup> Initially terming this approach the ecological thought, Morton<sup>241</sup> has since linked it to Harman's object-oriented ontology.<sup>242</sup> He has subsequently dubbed climate change one of several 'hyperobjects', which he defines as 'things that are massively distributed in time and space relative to humans'.<sup>243</sup> Although Morton's critiques have been widely read, the rigour and consistency of his theories, particularly his notion of hyperobjects, have been subject to ongoing scrutiny and debate.<sup>244</sup>

While climate change criticism shows no signs of abatement, it must be pointed out that it has, in turn, generated its own criticism. Gaston queries the idea that the Anthropocene is a profound challenge to representation and cautions against what he calls 'green deconstruction'.<sup>245</sup> Aravamudan reads critical climate change as catachronistic, that is, as applying a future event to present criticism, and, in doing so, compares it unfavourably with the mid-twentieth-century movement he calls nuclear criticism, that is, the literary theories that surrounded the cold war in the nuclear age.<sup>246</sup> For Aravamudan, because nuclear criticism was interested in texts rather than objects, it was able to imagine an agency after the apocalypse, which climate change criticism is not yet able to do.

## Conclusion

The end of the last decade, which saw the publication of McEwan's *Solar* (2009),<sup>33</sup> the performance of Waters's *The Contingency Plan* (2010),<sup>97</sup> and the 10:10 initiative by the *Guardian* newspaper (2010), paved the way in this decade for climate change to emerge as an important and urgent topic for writers, playwrights, and poets. Literary scholars have responded with an increase in the number of analyses of such literary texts. These ecocritical analyses are partly responsible for an emerging canon of climate change fiction. In addition, some of these ecocritical studies of climate change literature suggest that it plays a role in teaching us how to live with climate change, while others have attempted to maintain an objective stance by teasing out the complex representational challenges that climate change poses. The problem of complexity underpins the burgeoning field of climate change criticism, which is centred on the idea that climate change is a slippery concept posing not just a literary but an existentialist challenge.

However, this review of climate change fiction, drama, and poetry suggests that literature is concerned not just with climate change's representational and existentialist challenges but with its emotional and psychological dilemmas. Climate change fiction and drama, with their preoccupations with parenthood, and climate change poetry, with its dominant tone of lament, all circulate around the problem of the legacy of environmental degradation that humans today are handing on to species of tomorrow—human and nonhuman. It is this emotional concern with the future and its increasing prevalence in climate change literature that deserves closer scrutiny in literary studies as it continues its engagement with the global crisis of climate change.

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