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# A Space For Justice: Messianic Time in the Graphs of Climate Change

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**ABSTRACT** This article turns toward scientific literature to consider the basic strategies used in presenting the temporality of climate change. While the majority of literary criticism argues that the experience of climate change is either apocalyptic or banal, the scientific graphs of the Intergovernmental Panel on Climate Change organize time in a way aligned with Giorgio Agamben's concept of messianic time. Like Agamben's messianic time, the figures of the IPCC depict a disjointed present. Every figure is either a reconstruction of past climate or a projection of future climate—never a reconstruction the past that moves through the present and projects the future. Crucially, it is this disjuncture at the present moment that perhaps leaves a space open for justice—a justice that reveals itself in a series of figures that exhibit an underlying ethical relationship to the past and future. As a literary analysis, this paper brings out new aspects of scientific figures. Instead of focusing on the data these graphs communicate, it reveals how formal choices in presentation affect meaning and how scientific figures structure, articulate, and inform our experience of time.

In climate change artists and writers confront a serious representational challenge. The effects of climate change are so slow, displaced, and complex that they are notoriously difficult to represent effectively. Rob Nixon addresses this problem in his book, *Slow Violence*, where he argues that "climate change and a host of other slowly unfolding environmental catastrophes present formidable representational obstacles that can hinder our efforts to mobilize and act decisively."<sup>1</sup> So, the problem is not only academic; climate change is difficult to represent, and, at the same time, effective representation is necessary for action. Some critics focus solely on the difficulty of representation, concentrating on how the characteristics of climate change lend themselves easily to presentation as completely banal.<sup>2</sup> Timothy Clark goes so far as to say that climate change is so incremental, so vast in temporal and spatial scale that it may resist

<sup>&</sup>lt;sup>1</sup> Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge: Harvard University Press, 2011), 2.

<sup>&</sup>lt;sup>2</sup> Tom Cohen, "The Geomorphic Fold: Anapocalyptics, Changing, Climes and 'Late' Deconstruction," *The Oxford Literary Review* 32, no. 1, (2010): 71-89. Timothy Clark, "Some Climate Change Ironies: Deconstruction, Environmental Politics, and the Closure of Ecocriticism," *The Oxford Literary Review* 32, no. 1, (2010): 131-49.

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even being conceptualized.<sup>3</sup> Others, perhaps more interested in how representation can galvanize action, focus on how some works employ a strategy of representation that is the opposite of banal: climate change as apocalypse.<sup>4</sup> While apocalypse may be a legitimate framework for something that will be devastating on a global scale, this strategy of representation is also frequently attacked as alarmist and even deceitful in the popular press and conservative blogosphere.<sup>5</sup> In this essay, I turn to the scientific literature itself to investigate how the timescales of climate change are structured and represented. Specifically, I will use the scientific figures of the Intergovernmental Panel on Climate Change (IPCC) to argue that the way these figures present climate change is neither apocalyptic nor banal, but aligned with the messianic time described by Giorgio Agamben. In the final section I will address how the ways these graphs structure time can be played with and employed in artistic representations of climate change. While I explain messianic time in detail below, suffice it to say for now that the graphs contain a conception of time that challenges us to have an ethical relationship to the past and to the future, while at the same time calling into question the neat distinction between past, present, and future. The "time" of these scientific figures is one in which the present has extra potential, where the present is the hinge on which everything hangs. If the potential in the present moment can be grasped, then maybe, just maybe, the present can be held open enough to make a space for justice.

# Graphs: The Face of an Institution

Throughout this essay I take seriously the basic strategies used in the scientific presentation of the temporality of climate change. I choose to focus on the Third Assessment Report (TAR) from the Intergovernmental Panel on Climate Change (IPCC).<sup>6</sup> The IPPC is the world's premier authority on climate change which, roughly every seven years, is tasked with summarizing the state of knowledge on global climate. Instead of focusing on the text of the thousand-plus page report, I analyze the scientific figures. Scientific figures strangely have a life of their own. As contained units of meaning, they can be transferred to different contexts (blogs, newspaper articles, television news programs) more easily than scientific text which is bulky, complicated, full of jargon, and might require context. Graphs are simply more likely to be picked up by different media. Some graphs, like the (in)famous "hockey stick graph," dramatically capture

<sup>&</sup>lt;sup>3</sup> Timothy Clark, *The Cambridge Introduction to Literature and the Environment* (Cambridge: Cambridge University Press, 2011), 10.

<sup>&</sup>lt;sup>4</sup> Erik Swyngedouw, "Apocalypse Forever?: Post-Political Populism and the Spectre of Climate Change," *Theory, Culture & Society* 27, no. 2, (2010): 213-232. Mike Hulme, "Four Meanings of Climate Change" in *Future Ethics: Climate Change and the Apocalyptic Imagination*. ed. Stefan Skrimshire (New York: Continuum Books, 2010), 37-58. Peter Manely Scott, "Are We There Yet? Coming to the End of the Line—a Postnatural Enquiry," in *Future Ethics: Climate Change and the Apocalyptic Imagination* ed., Stefan Skrimshire (New York: Continuum Books, 2010), 260-280.

<sup>&</sup>lt;sup>5</sup> Greg Plowitz, "Lomborg Debunks Obama's 'Three Horsemen of the Climate Apocalypse," *Planet Gore: The Hot Blog.* National Review Online. 24 Jan 2013. Accessed 23 Feb. 2014.

<sup>&</sup>lt;sup>6</sup> I have chosen the TAR even though the Fourth Assessment Report (AR4) is more recent because I contend that the figures in the later report are more watered down. In addition, it is the graphs from the TAR that have set the tone for climate change science and media representations for a decade.

the public imagination. For instance, the hockey stick graph has appeared in various memes and comics<sup>7</sup> and has instigated vitriolic responses from climate deniers.<sup>8</sup>

Given the wider distribution of the scientific figures than the text of the bulky report, many more people may encounter a graph's presentation of time than will read the report itself. In a way, graphs are the face of this international organization. They not only provide an easier way into climate change for more people than a dense report, but also visual figures can reveal more about the hidden choices and first principles of an argument than the text of scientific literature. Paradoxically, because figures and visual images are read as closer to unmediated data than any discussion of said data, the underlying assumptions and impulses behind them become clearer.<sup>9</sup> As a literary critic, I read graphs differently than a scientist, paying attention to formal choices and the interplay between style and content. Graphs are a presentation of data, but there are formal choices that are made in that presentation that affect how the graph is experienced and what content is emphasized. Trained in teasing out the consequences of stylistic choices, I bring a much lacking formal reading of graphs to the table.

# Messianism, not Apocalypse

In analyzing these mobile and revealing graphs, I argue that the way they work upon the time of climate change follows Agamben's conception of messianic time from *The Time that Remains*. To a lesser extent I will draw on Derrida's intermittent engagement with Benjamin's "weak messianism" in his work *Specters of Marx*. While these conceptions of messianic time differ in important ways, it is not the project of this essay to investigate the differences and trace out the consequences of these different constructions.<sup>10</sup> Rather I will treat them as different conceptual resources in their own right, arguing that the time presented in the figures of the IPCC expresses specifically Agamben's conception of messianic time. My use of Derrida's work will be confined to discussion of ethical implications, specifically what a messianic conceptualization of time could mean for justice and for the promise of a future to come.

In *The Time that Remains*, Agamben revisits Paul's First Letter to the Corinthians to "restore Paul's Letters to the status of the fundamental messianic text for the Western tradition."<sup>11</sup> This means closely examining how the messianic event affects faith, law, the divisions between people, and time. In addition, he traces an intellectual history from Paul to Walter Benjamin, drawing many parallels between Benjamin's "Theses on the Philosophy of

<sup>&</sup>lt;sup>7</sup> For just one example of hockey stick cartoons see: Anthony Watts, and cartoonsbyjosh.com, "24 Hours of Climate Reality: Gore-a-thon-Hour 8," *Watts Up With That,* n.p. 15 Sep 2011, accessed 23 Feb. 2014.

<sup>&</sup>lt;sup>8</sup> Rand Simberg, "The Death of the Hockey Stick?" *P.J. Media*. 17 May 2012, accessed 23 Feb 2014. John Collins Rudolf, "The 'Hockey Stick' Lives," *Green: A Blog About Energy and the Environment, The New York Times*, 23 Sept, 2010, accessed 26 Feb 2014.

<sup>&</sup>lt;sup>9</sup> For a discussion on how scientific images, in this case brain images, are read as close to unmediated reality see: Joseph Dumit, "Is It Me or My Brain? Depression and Neuroscientific Facts," *Journal of Medical Humanities* 24, nos. 1/2, (2003): 35-47.

<sup>&</sup>lt;sup>10</sup> For such a discussion, see Catherine Mills, "Agamben's Messianic Politics; Biopolitics, Abandonment and Happy Life," *Contretemps* 5 (2004): 42-62.

<sup>&</sup>lt;sup>11</sup> Giorgio Agamben, *The Time that Remains: A Commentary on the Letter to the Romans,* trans. Patrici Dailey (Stanford: Stanford University Press, 2005), 1.

History" and Paul's Letters, demonstrating the enduring value of these messianic constructions as well as bringing forward new resonances in Benjamin's work. What this paper is primarily interested in within Agamben's work, however, is the structure of messianic time—how messianic time changes the relationship of the present to the past and to the future. In particular I will focus on the feeling of the messianic present ("the time of the now"), the relationship that messianic time challenges one to have with the past ("recapitulation"), the tension toward a future to come, and the tightening between past, present, and future that happens in messianic "operational time."

Before looking at these aspects of messianic time in the scientific figures themselves, it is important to note that messianic time in Agamben is not to be confused with eschatological time. It is quite distinct from the time schema of apocalypse. As Agamben writes, it "is not the last day, it is not the instant in which time ends, but the time that contracts itself and begins to end ... or if you prefer, the time that remains between time and its end."<sup>12</sup> Messianic time is not oriented toward the apocalypse, but toward the time that lies between the announcement of the end and the perpetually postponed end. As such, my reading does not align with those that argue that the presentation of climate change is apocalyptic.

## Time is Out of Joint

The first parallel between messianic time and the graphs of the IPCC is the present as a moment of rupture. In browsing through the Third Assessment Report, it quickly becomes clear that there is no graph that shows the past, the present, and the future. Graphs that have chronological time on one axis are either reconstructions of the past climate up to the present or projections of future climate from the present. There is no graph that traces reconstructions of the past through the present on into projections of the future. This literal disjointedness of the figures suggests that time is out of joint at the moment of the present. That scientific approaches and methods separate graphs of the past and the future speaks to the way in which time structures, is experienced and articulated by these scientific domains. The different scientific techniques that apply to the past and future are precisely the outcome of the disjointedness of the present—the past and the future relate to measurement, knowledge and action in different ways, and this disjunction leaves open a certain room for things to be disrupted.

The present is the moment of consequence for Agamben's figuration of messianic time as well. In fact, "Paul's technical term for the messianic event is *ho nyn kairos*, 'the time of the now.'"<sup>13</sup> In particular, the importance of the present in messianic time comes through its disjuncture. Agamben writes that the "ever so slight difference, which results from my having grasped my disjointedness with regard to chronological time, is, in every way, a decisive one."<sup>14</sup> Chronological time is no longer continuous, but disjointed, and, for Agamben, this disjuncture is the space in which subjectification occurs. To Agamben, subjectification is the process by which a subject is formed via the double movement of simultaneous sovereignty

<sup>&</sup>lt;sup>12</sup> Agamben, The Time that Remains, 62.

<sup>&</sup>lt;sup>13</sup> Ibid., 61.

<sup>&</sup>lt;sup>14</sup> Ibid., 69.

and subjection.<sup>15</sup> In the case of the messianic announcement, this subjectification differs from other instances in Agamben's work. For example, in "What is an Apparatus?" Agamben follows Foucault's example, examining confession (as it developed into a disciplinary apparatus) and how it produces a certain objectification of the subject that restricts its freedom.<sup>16</sup> But, in the case of the messianic event, subjectification opens the subject to its own freedom. For Agamben this subjectification produced by the messianic event is predicated upon operational time, the disjointedness of the subject from chronological time. While chronological time is aligned with the restrictive subjectification of confession which splits and secures the self, making it both subject and the object observed, operational time's subjectification opens the subject to her own agency and ability to take hold of time. Agamben writes:

Whereas our representation of chronological time, as the time *in which* we are, separates us from ourselves and transforms us into impotent spectators of ourselves—spectators who look at the time that flies without any time left, continually missing themselves—messianic time, an operational time in which we take hold of and achieve our representations of time, is the time *that* we ourselves are, and for this very reason it is the only real time, the only time we have.<sup>17</sup>

The gospel (or the apostolic address) in the messianic event transforms the subject. What is important about the "space" left open between the representations of the past and future is that it is the place of the subject receiving this new image of time which then demands that the subject reorient herself to the past and (possible) futures. The scientific figures which exhibit this very disruption of chronological time, perhaps leave a space open for this reconfiguration of the subject and a new, more just relationship to the past and future.

#### An Ethical Relationship to the Past

But what is justice? And how can justice enter into a scientific figure? Justice, in Jacques Derrida's sense, is not calculable or distributive; it is not a rendering justice, but it is found in a relationship, a stance. Derrida is interested in "justice as incalculability of the gift and singularity of the an-economic ex-position to others. 'The relation to others—that is to say, justice.'"<sup>18</sup> So justice, for Derrida, is remarkably content-less. It is not a set of rules or laws, a way to distribute benefits or burdens, but a particular relationship adopted toward others, one that recognizes the asymmetrical relationship to infinitely unknowable others—others from the present, from the past, or from the future. In this conception, justice will remain unachievable. As Paul Patton writes, Derrida "argues that the concept of justice is inherently aporetic or 'impossible' because it includes contradictory demands. For example, justice requires both that we address the specificity of a particular case and that we treat all cases equally in conformity

<sup>&</sup>lt;sup>15</sup> Giorgio Agamben, *Remnants of Auschwitz: the Witness and the Archive*, trans. Daniel Hellwer-Roazen (New York: Zone Books, 1999), 107.

<sup>&</sup>lt;sup>16</sup> Giorgio Agamben, *What is an Apparatus and Other Essays*, trans. David Kishik and Stefan Pedatella (Stanford: Stanford University Press, 2009), 20.

<sup>&</sup>lt;sup>17</sup> Agamben, The Time that Remains, 68.

<sup>&</sup>lt;sup>18</sup> Jacques Derrida, Specters of Marx: The State of the Debt, the Work of Mourning, & the New International, trans. Peggy Kamuf (New York: Routledge, 1994), 23.

with a universal law."<sup>19</sup> It is the unachievable nature of this justice, however, that makes the concept less empty than it seems. The fact that justice will never arrive in the present—that perfect justice is impossible—is precisely what gives it, and will continue to give it the capacity to motivate better futures. "It is a means by which an imagined future can intervene in or act upon the present. Just as a promise in relation to some future state of affairs has consequences for one's actions in the present, so the appeal to justice or to a democracy to come will have consequences in the present."<sup>20</sup>



**Figure 1** Millennial Northern Hemisphere (NH) temperature reconstruction (blue) and instrumental data (red) from AD 1000 to 1999, adapted from Mann et al. (1999). Smoother version of NH series (black), linear trend from AD 1000 to 1850 (purple-dashed) and two standard error limits (grey shaded) are shown. Image courtesy of the IPCC, Third Assessment Report, Figure 2.20.<sup>21</sup>

In the case of Figure 1, justice can be seen in the ethical relationship to the past put forward by the hockey stick graph. This is one of the most famous graphs in IPCC history. By using tree rings, ice cores, and other proxy data, scientists were able to reconstruct temperature for the northern hemisphere from the last thousand years. This figure has come to be known as the "hockey stick graph" because of its shape: it traces a slight downward trend in temperatures (the handle) and then a rapid increase in temperature since 1900 (the blade). The blue line is temperature reconstruction, and the red line is direct measurement of temperature using

<sup>&</sup>lt;sup>19</sup> Paul Patton, "Derrida, Politics and Democracy to Come," *Philosophy Compass* 2, no. 6, (2007): 766-780.

<sup>&</sup>lt;sup>20</sup> Paul Patton, "Politics," in *Understanding Derrida*, eds., Jonathan Roffe and Jack Reynolds (New York: Continuum, 2004), 26-36.

<sup>&</sup>lt;sup>21</sup> J. T. Houghton, Y. Ding, et al., eds., Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, 2001. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2001).

instruments (thermometers, meteorological stations, and satellites). The black line is a smoothed version of the blue line, and the gray shaded area is uncertainty. This graph is constructed to make two arguments. The first argument is that the current average temperatures of the northern hemisphere have risen very quickly to become higher than they have been anytime in the past thousand years. The second argument is that this data is as close to unmediated as possible. This second argument only becomes apparent when this graph is compared to an earlier version of the same graph.



*Figure 2* Image courtesy of Geophysical Research Letters.<sup>22</sup>

This earlier version from *Geophysical Research Letters* exhibits very different formal choices made in its construction. Here, there is no argument made by the formal choices that this data is natural, unmediated. Uncertainty is yellow, which doesn't look uncertain, it looks like a thick yellow highlighter emphasizing the slightly downward trend in temperature before 1900. The instrumental data is in bright red, superimposed on top of the reconstructed data, essentially drawing the eye toward this drastic uptick in temperature. In the IPCC graph, on the other hand, the red line indicating the danger of rapidly increasing temperatures is partially hidden behind the gray, blue, and black, and could be altogether more prominent given different choices in graph-making. In the IPCC version, the recent upward trend in temperatures simply does not draw the eye or look scary or important. What does draw the eye is the big block of gray on the left hand side of the graph, which is the biggest, weightiest shape in the image. Furthermore, this grey shape is uncertainty. Uncertainty is literally a gray area. It looks like what it is. Interestingly, in a way that the earlier version of the hockey stick graph did not, the choice of grays and blues here makes the IPCC version look natural, a bit

<sup>&</sup>lt;sup>22</sup> Michael E. Mann, Raymond S. Bradley, and Malcom K. Hughes, "Northern Hemisphere Temperatures During the Past Millennium: Inferences, Uncertainties, and Limitations," *Geophysical Research Letters* 26, no. 6, (1999): 759-762.

like trees reflected in a lake at dusk. Essentially, this graph is constructed from tree rings and, if only fortuitously, it looks like trees. Again, the formal choices in constructing the graph make it look like what it is made of. It is presented to be as uncontroversial as possible, offering a subtle argument that this is pure, natural, minimally mediated data taken directly from the natural world.



Figure 3 Image courtesy of Rich Evenhouse, licensed under the creative commons.<sup>23</sup>

Despite the IPCC's attempts to make the figure appear as neutral and natural as possible, it immediately began to appear all over the skeptical blogosphere, even inspiring one GCC-skeptic to demand and start an independent "audit" of the graph.<sup>24</sup> From the vehement denial of the graph's validity, it is clear that the figure is indeed positing a third argument which rankles some viewers. I sum up that argument in the following way: We have an ethical relationship to the past—a relationship in which there is a lot at stake. So much, as it turns out, that people remain committed to tearing this figure from the IPCC down. One strong reading of the graph is that it endows the past with the same potential that messianic time does for Agamben. He argues that the "widespread view of messianic time as oriented solely toward the future is fallacious."<sup>25</sup> In fact, in messianic time the past is of the utmost importance as it is only

<sup>&</sup>lt;sup>23</sup> Rich Evenhouse, "Reflected Pine Trees: The Reflection of Pine Trees on the Water at Night in Riley Trails, Holland, Michigan" 28 July 2007, *Flickr*, accessed 23 Feb 2014.

<sup>&</sup>lt;sup>24</sup> Fred Pearce, "Climate Change Debate Overheated after Skeptic Grasped 'Hockey Stick,'" *The Guardian UK* 9 February 2010.

<sup>&</sup>lt;sup>25</sup> Agamben, The Time that Remains, 77.

from the past that any tension toward the future can spring. The relationship towards the past in messianic time is one of recapitulation, "a kind of summation of all things, in heaven and on earth—all that has transpired from creation to the messianic 'now.'"<sup>26</sup> Messianic time challenges one to come to terms with the past, to acknowledge and affirm the past rather than deny it, or ignore it in the blind pursuit of a messianic future. "[F]or Paul recapitulation ... is a contraction of past and present, that we will have to settle our debts, at the decisive moment, first and foremost with the past."<sup>27</sup> In recapitulation, messianic time makes the past part of the present, contained within it. The past is entwined so entirely with the present that there is a "quasi unity between the two times."<sup>28</sup> This construction of the past as something that cannot be ignored, as something to which we owe a debt is a kind of ethical stance toward the past where history cannot be denied and the past can never simply be forgotten.

A consideration of Agamben's reflections on messianic time enables a fuller appreciation of the work done by the graphs in constructing the audience's relationship to time. The graph, like messianic time, forges a relationship to time in which the past does and should have bearing on this present moment, that, in fact the present must contain and recapitulate the past, that any striving toward the future must come out of fully assuming the past. The graph is often read as demonstrating that current temperatures are not permissible because they are not in line with past temperature ranges. The drastic upward tick of temperatures in the last 100 years clearly positions current temperatures as outside charted territory. We cannot simply ignore the past, but, in order to live ethically, must take it into account, must make it constantly present.

This logic, of keeping the past always present is in some ways counter to the logic of capitalism which would argue that present concerns-the current economy, trade, etcoverride concerns about our relationship to the past. This could explain part of the vitriolic reaction to the hockey stick graph and to anthropogenic climate change in general. After all, if people simply disagreed with the accuracy of the data the graph presented, the response would hardly be so bitter. It is the graph's argument that we can no longer go about business as usual that is so threatening. The radical presentist attitude of capital requires placing current economic health first, over investments in fixing climate. The presentist imperatives of global capital bitterly clash with an ethical stance of keeping the past (and the future) in mind. As Timothy Clark puts it, climate change "undermines and challenges the terms of consumer democracy and the liberal tradition in political thought."<sup>29</sup> In a way, the climate skeptics so opposed to this graph, are like complaining Hamlet in our own "out of joint" time. As Derrida has argued, "Hamlet does not curse so much the corruption of the age. He curses first of all and instead this unjust effect of the disorder, namely, the fate that would have destined him, Hamlet, to put a dislocated time back on its hinges-and to put it back right."<sup>30</sup> The deniers curse not the fact that the climate is out of joint (for they deny this), but they fight against any design or any implication that we are obligated to set it right.

<sup>&</sup>lt;sup>26</sup> Agamben, *The Time that Remains*, 76.

<sup>&</sup>lt;sup>27</sup> Ibid., 78.

<sup>&</sup>lt;sup>28</sup> Ibid., 77.

<sup>&</sup>lt;sup>29</sup> Clark, "Some Climate Change Ironies."

<sup>&</sup>lt;sup>30</sup> Derrida, Specters of Marx, 20.

The hockey stick graph demonstrates how the disjointedness of the present can open a space for justice in terms of an ethical relationship to the past. The structure of this ethical relationship to the past is as loose as having a relationship to the past at all—keeping it attached to the present, paying our debts first and foremost to the past. The relationship to the past that the graph sets up is, ironically, made visible not only by the graph itself, but by the popular backlash generated by the figure.

#### The Relationship to the Future "to Come"

The next graph sets up an ethical relationship not to the past, but to the future. This figure is a projection of what have become the six standard scenarios for greenhouse gas emissions for the next hundred years. They come from the IPCC's Special Report on Emissions Scenarios (SRES) which has become essential to scientific communication and comparison. These scenarios act as a common language for climate projections and models. They can be input into any climate model; a common set of scenarios enables comparison across studies.



Figure 4 Global GHG emissions (in GtCO2-eq per year) in the absence of additional climate policies: six illustrative SRES marker scenarios (coloured lines) and 80th percentile range of recent scenarios published since SRES (post-SRES) (gray shaded area). Dashed lines show the full range of post-SRES scenarios. The emissions include CO2, CH4, N2O and F-gases. Image courtesy of the IPCC, Fourth Assessment Report, Figure 3.1.<sup>31</sup>

The colored lines represent different emissions scenarios that the IPCC has devised. Each line traces out a possible trajectory of how many gigatons of carbon dioxide equivalent are being released into the atmosphere each year for the next hundred years. Below is the legend for this figure which describes in detail what the parameters of each of these lines are, but basically B1, A1T, B2, A1B, A2, and A1FI are all different carbon emissions scenarios projected for the future that are based on different development pathways for global economies and technologies. The grey shaded area shows the range in which 80% of the studies that have

<sup>&</sup>lt;sup>31</sup> Neboisa Nakicenovic, O. Davidson, et al., eds., Emissions Scenarios: A Special Report of Working Group III of the Intergovernmental Panel on Climate Change (Cambridge UK and New York: Cambridge University Press).

come out since the original SRES lie, and the two dotted lines show the maximum and minimum of these subsequent studies.

#### Box 5: The Emissions Scenarios of the Special Report on Emissions Scenarios (SRES)

A1. The A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies. Major underlying themes are convergence among regions, capacity building and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income. The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end-use technologies).

A2. The A2 storyline and scenario family describes a very heterogeneous world. The underlying theme is self-reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily regionally oriented and per capita economic growth and technological change more fragmented and slower than other storylines.

B1. The B1 storyline and scenario family describes a convergent world with the same global population, that peaks in mid-century and declines thereafter, as in the A1 storyline, but with rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives.

B2. The B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the A1 and B1 storylines. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels.

*Figure 5* Descriptions of the storylines from the Special Report on Emissions Scenarios. Image courtesy of the IPCC, Third Assessment Report, F.1 Box 5.<sup>32</sup>

This figure does not engage with the issues most often debated in moral philosophy about climate change: the question of "how to allocate the costs and benefits of greenhouse gas emissions and abatement."<sup>33</sup> The familiar and most often addressed argument is that developed countries have been the biggest emitters historically, so they should bear the biggest financial burden of remediation. While there are graphs in the IPCC report about historical emissions or emissions projections broken down by country, this graph does not directly address this kind of distributive justice. Instead, it sets up a particular relationship with and attitude toward the future. In particular, it sets up a shared global fate and a utopian relationship with future emissions.

<sup>&</sup>lt;sup>32</sup> R. T. Watson and the Core Writing Team, eds., *Technical Summary F.1: The IPCC Special Report on Emissions Scenarios (SRES)*. *IPCC, 2001: Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge UK and New York, USA: Cambridge University Press, 2001).

<sup>&</sup>lt;sup>33</sup> Stephen M. Gardiner, "Ethics and Global Climate Change," *Ethics* 114 (2004): 555-600.

This scientific figure is utopian in two ways. First, it is utopian in the pejorative sense of being naively and unrealistically optimistic. According to Steven Gardiner, "Alarming as the IPCC predictions are, we should also pay attention to the fact that they might be overly optimistic."<sup>34</sup> And it is true that every year until the economic crash of 2008 actual greenhouse gas emissions tracked or exceeded the highest scenario depicted here. Even now, actual emissions are above all but the highest scenario, so emissions are quickly rebounding, showing all but the highest scenario to be naively optimistic.

More interestingly, this graph is utopian in another more complicated, creative way. It is important to step back and realize what a profoundly imaginative practice this graph embodies. This graph is an imagining of potential worlds. Similar to Derrida's writing on justice and messianism in *Specters of Marx*, this graph imagines what is "to come." Although Derrida scrupulously avoids the term utopia, which he considers to be too regulating, his musings on communism "to come," democracy "to come," the pledge, and the promise are quite aligned with more open and complex definitions of utopia. He writes:

[T]he idea, if that is still what it is, of democracy to come, its "idea" as event of a pledged injunction that orders one to summon the very thing that will never present itself in the form of full presence, is the opening of this gap between an infinite promise (always untenable at least for the reason that it calls for the infinite respect of the singularity *and* infinite alterity of the other as much as for the respect of the countable, calculable, subjectal equality between anonymous singularities) and the determined, necessary, but also necessarily inadequate forms of what has to be measured against this promise.<sup>35</sup>

Derrida's account of the "to come" as a challenge to summon what can never be completely present, as an infinite but ever-unattainable promise is a powerful testament to the ways that imagined future worlds ("to come") challenge us in the now.

This scientific figure presents imagined (and perhaps unattainable) worlds to come. These scenarios are generated by using highly complex mathematical models, yet are rather open and free of specific content. They are not based on specific policies like the implementation of carbon taxes or a cap and trade system. All differences among the scenarios are differences in the type of world imagined—a world where technology is shared (or not) or a world of lessening (or widening) disparity, for example. The legend for this graph revealingly states that each line "describes a world," so even the language of the graph reinforces the idea that each of these lines is indeed a potential, imagined world. Each lettered and numeric combination represents one world-one possible trajectory for social and economic development. The legend describes B1, for example as a "convergent world" that is invested in "global solutions" and "improved equity" where "population peaks mid century," and technology is shared among regions. So, disparities in wealth and technological development between nations are narrowing, and problems like climate change and population increase are confronted with global rather than regional solutions. A2, on the other hand "describes a world" where "economic development is primarily regionally oriented and per capita economic growth and technological change are more fragmented." Also, global population

<sup>&</sup>lt;sup>34</sup> Gardiner, "Ethics and Global Climate Change."

<sup>&</sup>lt;sup>35</sup> Derrida, Specters of Marx, 81.

continues to rise. Here, we clearly have a world of great disparity; the economy and technological innovations are high in some areas and stagnating in others, there is no sharing of technology, and solutions to problems are dealt with on a regional scale. It is easy to see how scenario B1 might be considered utopian, but what do we make of this "bad" scenario? Is this still utopian?

It is useful here to draw on the work of Frederic Jameson to remind us that utopias are not simple imaginations of a good place:

It is a mistake to approach Utopias with positive expectations, as though they offered visions of happy worlds, spaces of fulfillment and cooperation, representations which correspond generically to the idyll or the pastoral rather than the utopia ... [Utopias] aim at the alleviation and elimination of the sources of exploitation and suffering, rather than at the composition of blueprints.<sup>36</sup>

So utopias are not meant to be taken as a blueprint for a perfect society. Rather, one imaginatively enters a utopia by reading a book (or contemplating a graph in this case), and after existing within that society for a while, emerges and looks at our own world with new eyes. Inequalities and asymmetries become apparent, and the utopia prompts us to question our own world (which is precisely the role of the "to come" in Derrida<sup>37</sup>). This questioning of our current world is what happens after careful consideration of this graph and its legend. It is actually necessary to spend quite a bit of time with this graph to understand it. The legend (above) is dense, and written entirely in what appear to be euphemisms: for example, the use of terms like "convergent world" instead of "a world with less (economic, political, power ...) disparity." It takes a moment to puzzle out what a convergent world actually is. Understanding the graph requires constant decoding of the legend as well as frequent glances back at the graph itself to check which description goes with which line (the order on the graph does not match the order of descriptions on the legend). So in order to understand this graph's meaning, dwelling imaginatively with it for some time is required. Because none of these scenarios has any probability attached to it, one emerges questioning what kind of world we do live in, asking: Is population going to peak midcentury? Do we share technology between nations? Is economic development primarily regionally oriented? These scenarios are not so much blueprints for us to follow as ways into a deeper questioning of our own societies. What kind of world do we live in and what kind of world do we want to live in? The graph accomplishes this better by including the A2 and the A1FI scenarios than it would if it only presented "good" scenarios. In short, if all the scenarios were very similar, there would be no impetus to question which type of world we live in.

The SRES graph is even more explicitly utopian in that the figure even resonates with some of the typical generic conventions of utopian literature. In this genre, a traveler journeys to an unknown land either distant in space or far in the future and is given a guided tour of the

<sup>&</sup>lt;sup>36</sup> Frederic Jameson, *Archeologies of the Future: The Desire Called Utopia and Other Fictions* (London: Verso, 2005), 12.

<sup>&</sup>lt;sup>37</sup> Though both the utopia and the "to come" in Derrida prompt us to question our own world, they do so through very different means—utopias through imagining a different society, Derrida through hyperbolic concepts like freedom and justice, for example. The graph's methods of questioning the current world are clearly more like the former.

society including detailed explanations of the principles of its organization. Throughout the journey there remains an awareness that the traveler will return to his own land to take back the message of a radically alternative way of living.<sup>38</sup> As detailed as the explanations of the society are (and they are very detailed—even including things like seating arrangements at the table, tours of prisons, marriage ceremony components, etc.) the core of each utopia is very simple. Most utopias explore only a few simple changes and the subsequent, far-reaching, consequences: the first, and most often cited example is Thomas More's abolition of money and property in Utopia. In fact, the most famous utopias "all were able to offer utopian programs that could be grasped with a single slogan and seem relatively easy to put into effect."<sup>39</sup> Here, in this graphical utopia from the IPCC, the simple alternative that is explored is the elimination of disparity. It makes sense that now, in an age of great disparity, this graph "describes a world" where there is more sharing of technology, the gap between rich and poor countries is narrowing (a "convergent world"), there is "improved equity," and an interest in "global solutions" rather than regional ones.<sup>40</sup> In fact, each of the six emissions scenarios seems to focus around the carbon pathway that would result from more or less disparity in the world. Like all great utopian experiments, this graph is interested in the consequences of one simple change. In this case we have a traveler going to these alternative futures and returning to our world to tell us of the alternative constructions. In this reworking of the utopian genre it is not a human traveler journeying to the future, but perhaps the computer models themselves that travel forward in time and come back to describe alternative organizations. These nonhuman explorers are of the utmost importance to the utopian project of the graph, because after all, much of the power of a utopia stems from its position at the boundary of fact and fiction. These nonhuman travelers lend the alternative worlds authority and an air of unbiased, mathematical reality to what could otherwise be seen as pure fancy.

As in the previous example of the hockey stick graph, the formal choices made in the display of this graph support this relationship to the future. If the object of the graph is to merely show where emissions will likely be in 2100, the individual scenario lines are not actually needed. The gray shaded area suffices. But the scenarios are colorful trajectories of potential worlds that capture viewers' eyes and imaginations. Each has its associated text describing a world with a few simple changes that have far reaching consequences to global greenhouse gas levels a hundred years out. They make for an easier entry and more prolonged stay in this utopian imagining which puts greater pressure on our current world. Moreover, the bright color choices—red, orange, green, light and dark blue, and purple against the gray background—gesture to both the storm and the rainbow that may come after, reinforcing the hope that is central to utopian imaginings. After all, a rainbow is often read as God's promise to Noah of a future to come.

The utopian project of the emissions scenario graph reflects the call in messianic time for an ethical relationship to the future. The graph demonstrates concern for "This

<sup>&</sup>lt;sup>38</sup> Fatima Vieira, "The Concept of a Utopia," in *The Cambridge Companion to Utopian Literature* ed. Gregory Claeys (New York: Cambridge University Press, 2010), 7.

<sup>&</sup>lt;sup>39</sup> Jameson, Archeologies of the Future, 12.

<sup>&</sup>lt;sup>40</sup> Emissions Scenarios: A Special Report of Working Group III of the Intergovernmental Panel on Climate Change.

responsibility and this respect for justice concerning those who are not there."<sup>41</sup> All who are not "there" includes those not "there yet" in addition to all those who are no longer "there." But fostering and maintaining concern for those who are not here yet is more difficult than it seems. In much environmental writing, "the children" become shorthand for the future; they serve as an imaginative bridge tying a sketchy and hypothetical future to human beings who are actually here now. Similarly, this graph makes concrete the concern for those who are not here yet by imagining, in detail, potential worlds. How can you care for a future without first imagining it? But in imagining these future worlds the concern for those "not there" becomes a concern not only for the future, but for those who are "not there" because they are imagined. This concern for potential, imagined worlds works in close dialogue with an ethical relationship to the present. It tightens the ethical relationship between the present and future because these future imaginings prompt us to question our current world which in turn opens up alternative possible futures. Imagining potential worlds highlights sources of suffering and exploitation in the present, which can then bring about the best of these potential worlds.

## The Future is Always Already With Us

In order to complicate this neat structure of ethical relationship to past, disjointed present, and utopian imaginings of future I have set up so far, I turn to one last graph from the IPPC report, a graph showing the characteristic timescales on which climate processes take place.



*Figure 6* The characteristic time scales of some key processes in the Earth system: atmospheric composition (blue), climate system (red), ecological system (green), and socio-economic system (purple). Image courtesy of the IPCC, Third Assessment Report, Figure 5.1.<sup>42</sup>

This figure shows the time it takes in years for different atmospheric, climate, ecological, and socio-economic systems to fully adjust to changes. For example, it takes two to four years for greenhouse gases to mix in the global atmosphere, but it takes 120 to 150 years for air

<sup>&</sup>lt;sup>41</sup> Derrida, Specters of Marx, xix.

<sup>&</sup>lt;sup>42</sup> IPCC, Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, eds. R.T. Watson, and the Core Writing Team (Cambridge UK and New York, USA: Cambridge University Press, 2001).

temperature to respond to a rise in carbon dioxide. It takes up to 10,000 years for ice caps and sea level to respond to temperature change. This graph presents the complicated concept of climate inertia in an easily understandable way. It also confuses all classifications of past, present, and future demonstrating that the future, like the past, is always already with us.

In Agamben's examination of messianic time, operational time is a key concept, and this graph essentially shows the different and conflicting operational times for different systems that influence and are, in turn, influenced by climate. For Agamben operational time is the time it takes to construct a time image. He examines how all thinking and language require the construction of time images, so we as subjects never coincide with our own thoughts. In order to do anything in time, we have to construct a conceptualization of time; there are therefore infinitesimal lags between thought and speech, thought and action, thought and conscious articulation of thought. We are never quite synchronous with ourselves. We are always, already in messianic time. Any construction of time, for example Agamben's own example of past-present-future, is a construction of time that includes all of time except for the time used in constructing the time image itself. That is operational time, the time running alongside and lagging behind or outside the time we can conceptualize. To Agamben, messianic time is an operational time, and there is great possibility in that. "Messianic time, an operational time in which we take hold of and achieve our representations of time, is the time that we ourselves are, and for this very reason, is the only real time, the only time we have."43 For Agamben, not only is operational time a more accurate description of our experience of time ("the only real time"), but it is a time that holds great potential. It is the time that "we take hold of"; it is the time that can be seized; it is the time that is non-contemporaneous with time, which allows us to grab time and harness the potential in it.

Noncontemporaneity with the present is exactly what this graph reveals. Plotting out different operational times of different climate cycles makes visible how due to climate inertia today's carbon emissions will drive warming for hundreds of years, and how warming of a degree or two can drive glacier melting for up to 10,000 years. We will be feeling today's carbon emissions for thousands of years. Similarly the warming we feel today is due to emissions from over a hundred years ago. So the different timescales of different processes reveal how the paradigm of past, present, and future are literally, and not just figuratively, embroiled and enmeshed. This graph tightens the ethical relationships the other graphs began to set up toward the past and future. Not only do we have to keep the past in mind, but we are so tied to it that we are actually living it. Similarly not only do we position ourselves in an ethical relationship to the future by describing possible worlds, but we are in a very real way creating these worlds and living them. Even if we stop putting any carbon in the air tomorrow, because of climate inertia, we are locked into a certain amount of warming. As in messianic time, the future is already with us.

This tightening of past, present, and future does not invalidate the possibility and future world imaginings of the SRES graph. Although the climate inertia graph does reveal how we are locked into a future dictated by today's and yesterday's emissions, today's emissions are still controllable. We can, this graph demonstrates, create the future worlds that were only imagined in the SRES figure. Unlike the apocalyptic or the banal, messianic time allows space

<sup>&</sup>lt;sup>43</sup> Agamben, The Time that Remains, 68.

for this creative potential in the present moment to come forward. Agamben describes messianic time as contracted time; it is time that is compressed to the point of palpable potentiality. "Contracted," to him "signifies the act of brailing [or furling up] sails as well as the way in which an animal gathers himself before lunging."<sup>44</sup> Because it is time with all this ready potential, it can be seized. "Messianic presence lies beside itself, since, without ever coinciding with a chronological instant, and without ever adding itself onto it, it seizes hold of this instant and brings it forth to fulfillment."<sup>45</sup> This noncontemporaneity with the present, this future that is always already with us but, somehow, also alongside us, is what allows the moment to be seized. Neither eschatological time nor banal time present such potential in the present moment, and therefore viewing climate change within the framework of messianic time could be more conducive to action.

Interestingly, this graph, also through noncontemporaneity, brings in some of the pressing, specific social justice issues to which this essay's earlier, generalized, formulations of justice only gesture. Derrida's justice, as unachievable but aspirational, of course challenges us to consider specific justice issues in the present, and this graph similarly signals some current areas of specific concern. While in some discourses, climate change is primarily a future event, this graph and its emphasis on climate inertia highlights that there are people whose fresh water is already being destroyed by salt water contamination, who are trying to find money to build sea walls, who are already climate refugees. Some people are experiencing not just inconvenient or expensive effects but life threatening climate change and are doing so under conditions of great power disparity.<sup>46</sup> Instead of allowing for a place-based explanation of these effects (arguing that this or that place has a more vulnerable landscape, society, location ...), the graph suggests that differences in severity may also be a matter of time, that anyone can see her own future in the most affected communities.

#### A Light Blue Line

In this final section I will return to the question of artistic representation brought up in the introduction. How does this discussion of messianic time in the figures of the IPCC help with artistic representation of climate change? While this paper has been quite theoretical and science-focused, looking to the approaches of representation that are evident in the scientific literature does reveal certain strategies that may be effective in representing climate change in art. Instead of considering climate change as encompassing timescales too large and slow to capture attention or conflating climate change with apocalypse, messianic time opens up new ways for artists to represent and conceptualize anthropogenic climate change. Because of climate inertia and the operational time of different climate processes, one successful artistic strategy might be to include some aspect of this all-at-onceness, some dramatization of the fact that the future is always already with us. For example, the "Light Blue Line" project by the New Media Studio planned to draw a blue line across Santa Barbara public streets marking the level

<sup>&</sup>lt;sup>44</sup> Agamben, The Time that Remains, 68.

<sup>&</sup>lt;sup>45</sup> Ibid., 71.

<sup>&</sup>lt;sup>46</sup> Neil W. Adger, Saleemul Huq, *et al.*, "Adaptation to Climate Change in the Developing World," *Progress in Development Studies* 3, no. 3, (2003):179-195.

to which the sea would rise if the Greenland ice sheet were to completely melt.<sup>47</sup> Although 21 feet of sea level rise is more of a worst-case scenario, the logic behind this number is that if carbon emissions are not cut back, at some point temperatures will be raised enough and enough ice will already be melted that the Greenland ice sheet will be locked in to fully melting. Climate lags are wrapped up even into the basic artistic choices of the project. Furthermore, painting a line on the streets and on maps to be displayed makes present a possible future. On the very streets of Santa Barbara, one would be able to see, walk with, and feel the distant future.

Looking in more detail at the results of this project reveals that it also includes an implicit argument for an ethical relationship to the past. The map of Santa Barbara with the light blue line meandering across it reveals that seven meters of sea level rise would inundate highway 101, the train tracks, and the airport. Instead of inviting viewers to look at the line on a map and check whether or not one's house would be "okay," the point of the project is to demonstrate that Santa Barbara as we know it would simply no longer exist; it would not be the same city. Its character as a city along major transportation lines would be lost, and it would be an isolated town, one that is more like an island with one small highway deadending into it. The success of the project depends on the assumption that viewers would wish to honor the particular and unique history not only of Santa Barbara's historic structures, or particular people's homes and businesses, but its character as a city. In order to appreciate this piece you have to be invested in the particular history and structure of Santa Barbara, and more broadly, coastal communities in general. The light blue line also invites reflection on the scale of the human and financial costs of this kind of change. This is one coastal community out of many, after all, and every coastline in the world would be affected, not to mention low-lying islands that would be completely inundated. The light blue line challenges viewers to believe that a sunken history is a loss, that allowing the destruction of the history, character, and culture of a place is denying the past.

In a more subtle move, the "Light Blue Line" simultaneously invites a summary judgment upon the past. In an effort to avoid individual interpretations of the line (e.g. checking whether one's personal property would be "safe" given catastrophic sea level rise), the project emphasizes how major infrastructure would be disrupted on a massive scale, changing the very character of the city. Upon reflection, it becomes clear that this very infrastructure which makes Santa Barbara the place that it is (the highway, the airport, and to a lesser extent, the train tracks) is implicated as part of the problem that would cause sea level rise in the first place. Highway systems that were built on and for automobile culture, trains that transport coal to power plants, and airplanes all add to the gigatons of carbon added to the atmosphere each year. Negotiating a relationship to the past and keeping the past always in mind is much murkier than a simple acceptance and acknowledgement that the past has bearing on and value in the present. The "Light Blue Line" makes the argument that the past has bearing on the present not only because we can only evaluate the present in terms of the past (the character of Santa Barbara in terms of its particular history) but because it challenges us to also judge that past (the very infrastructure that gives Santa Barbara many aspects of its

<sup>&</sup>lt;sup>47</sup> Bruce Caron, Tom Moritz, and Marty Landsfeld, "Lightblueline," *New Media Studio*, accessed 23 Feb. 2014.

character is implicated in the sea level rise which could destroy that character). As Agamben writes: "for Paul recapitulation ... is a contraction of past and present, that we will have to settle our debts, at the decisive moment, first and foremost with the past. This obviously does not imply attachment or nostalgia; quite the opposite, for the recapitulation of the past is also a summary judgment pronounced on it."<sup>48</sup> This project taps into the sense of potential in the present moment of messianic time through this double move of acknowledging the past's bearing on the present, desiring to accept rather than ignore history, while at the same time pronouncing judgment on this past. The present is the moment in which it is possible to, by remaining always aware of the past, decide how to move forward.

Messianic time is a structure that resonates with the way climate change challenges unexamined relationships to time. Instead of defeatist attitudes that may result from climate change presented as apocalypse, or as too slow and banal to represent, messianic time is a call to action, a call to have a different relationship to time, even distant time. We are urged to recognize that the past has great bearing on the present, we are called upon to take up the monumental task of imagining potential worlds, and we are challenged to recognize that we create these worlds in our present. As Agamben says, messianic time is the time that can be seized: "it seizes hold of this instant and brings it forth to fulfillment."<sup>49</sup> However, we must be careful with seized time; it is never clear whether one can seize time or whether time itself is what seizes; a moment seized could be a moment grasped and taken up, or it could be a moment paralyzed and "seized up." Both messianic time and the temporality of climate change have the potential to either be grasped or to stall and stutter.

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<sup>&</sup>lt;sup>48</sup> Agamben, The Time that Remains, 78.

<sup>&</sup>lt;sup>49</sup> Ibid., 71.

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