

MONSTERS IN THE GREENHOUSE

Risk, faith and science in the Anthropocene
Dissertation Proposal: chris crews



Monsters in the Greenhouse **Risk, faith and science in the Anthropocene**

With all of the hysteria, all of the fear, all of the phony science, could it be that man-made global warming is the greatest hoax ever perpetrated on the American people? It sure sounds like it.

-Senator James Inhofe

In 2011, Americans experienced a record-breaking 14 weather and climate disasters that each caused \$1 billion or more in damages, in total costing approximately \$53 billion, along with incalculable loss of human life. These disasters included severe drought in Texas and the Great Plains, Hurricane Irene along the eastern seaboard, tornadoes in the Midwest, and massive floods in the Mississippi River Valley. In the period of January through March 2012, Americans also experienced record warm temperatures, with temperatures across the contiguous United States 6.0 degrees F above the long-term average. In March alone, 15,292 warm temperature records were broken across the United States.

-Extreme Weather, Climate & Preparedness in the American Mind

Andrea: Wrapping paper, colored tissue, anything?

Dale: You serious?

Andrea: How can you not have any?

Dale: Had I been informed of the impending apocalypse, I'd have stocked up.

-The Walking Dead, *Vatos*

*What I want to say is that the problem with the social sciences is that they are not empirical enough, just at the time in history when they are most needed to redesign the whole spheres of existence from top to bottom. Or rather, they have inherited a very narrow definition of empiricism, what I call *first empiricism*. What's the difference with the second empiricism, the one that James called "radical"? Precisely: relations, or connections, that is precisely those modes of connections, or modes of existence that are *not* depending on the divide, on the bifurcation, between, natural and social.*

-Bruno Latour

Introduction

This dissertation offers a political and cultural analysis of the Anthropocene, or Age of Man, a newly proposed term within the geological sciences. The proposal calls for creating a new epoch, which is a unit of geological time, which would signify a new period of geologic activity beginning with increased CO² in the environment around 250 years ago, correlated to the rise of fossil fuel use and industrialization across Europe and North America. Chapter one begins by tracing the genealogy of the Anthropocene, taking us back to the 1700's when our modern geologic and biologic sciences were born. I examine several critical moments in time where scientific and Christian worldviews broke ranks over conflicting explanations for the age and formation of the earth and theories of the evolution of life. I argue that understanding these earlier debates is critical because we are witnessing a resurgence of these same Christian fundamentalist claims today in the geological and biological sciences, a revival which is threatening the basic foundations of earth science and environmental conservation.

Chapter two offers a reading of the Anthropocene through environmental discourses focused on the end of nature or post-environmental politics, a concept which capture not only scientific arguments about our changing planet, but also deeper cultural fears about our place in this new world. I argue these postnatural concerns are clearly visible if we pay special attention to the roles of risk and faith in how we imagine and relate to nature in the future, and this exploration forms the theoretical heart of my dissertation. Here I build on the work of earlier theorists of environmental and cultural risk, particularly Mary Douglas and Ulrich Beck, as well as a group of scholars writing on this environmental theme, such as Bruno Latour, Bill McKibben, Will Steffan, Ted Nordhaus, Michael Schellenberger, Erle Ellis and Peter Kareiva. I argue we can study these different cultural understandings of how our views of nature and the environment are changing by looking at how we encode those symbolic fears within popular media and culture, as these are the contemporary vehicles for myth and meaning.

Chapter three develops this argument about environmental risk and the future through the figure of the monster and narratives about global apocalypse, which I argue are two dominant narratives that inform modern pop culture. As environmental sociologist Christopher Podeschi argues, popular media transcodes our cultural views and fears about nature into what he calls future myths, which “provide a vision of the future value of nature and of the society's relationship with nature”.ⁱ As evidence, I look at a series of recent TV series and movies dealing with monsters and apocalypses, in particular the most powerful of these hybrid narratives, *The Walking Dead* zombie apocalypse. I show how these disaster survival narratives, including a zombie apocalypse (*The Walking Dead*) or viral pandemic (*The Colony*), have become central to our growing existential fears about future environmental risks.

Chapter four then moves to the question of the role of faith in these debates, both scientifically and spiritually. In complex ways various forms of faith are at work every day, from faith in the market and technology to faith in a higher or supernatural power. To look at how these ideas are impacting the Anthropocene, I analyze several creationist science textbooks, as well as a book and DVD series called *Resisting The Green Dragon*, published by the fundamentalist think tank The Cornwall Alliance. Both of these cases allow me to dig deeper into the tension between secular and religious understandings of faith and see how they intersect with questions of the environment, and climate change in particular.

Chapter five looks at the relationship between technology and environmental problems. I argue that technologic solutions have come to dominate our modern thinking, a phenomenon scholars have referred to as the “technological social paradigm” or techno-society.ⁱⁱ I argue that earlier narratives of technological progress have begun to break down as the true social and ecological costs of technology become more apparent, especially in relation to climate change and sustainable development debates. This technologic debate has widened the divide between those calling for more technology to fix our problems, and those arguing that our over-reliance on industrial technology is itself the root problem.

To highlight this techno-environmental debate, I look at the case of geoengineering, which

includes a range of hypothetical solutions for how we might deal with climate change all premised on an assumption that technology is the solution, rather than the problem, to addressing climate change. Techniques include spraying sulphur particles or other chemicals into the stratosphere to reflect sunlight back towards space in order to simulate volcanic eruptions which cause a temporary cooling of the planet, covering the planet with a network of small mirrors to reflect sunlight back into space, and dumping large amounts of iron particles into the ocean in a process known as iron fertilization, in order to stimulate algae growth for marine food and improve CO² capture in surface ocean waters.

These technologies are hugely controversial, largely because we have no real scientific basis on which to judge them, but also because of the huge potential for unintended ecological consequences. This issue offers a timely example of how notions of risk, faith, science and technology are all coming together in the Anthropocene to shape our response to major environmental problems. There is also a high probability over the next decade that this technology may become one of the major environmental battlegrounds for dealing with climate change and a warming planet, and thus it is critically important to understand the foundation of these practices and their political implications.

I conclude by arguing we should expand our view of the Anthropocene beyond its original scientific origins and see it as an environmental discourse focused on making sense of our changing cultural and political relationship to nature. Seen in this way, we can situate the scientific and political debates within a broader social, cultural and religious milieu, which will help us to grasp the multiple and competing interests at work in defining the meaning and significance of the Anthropocene today. And while there is no single, definitive answer for what the Anthropocene should mean, this survey is meant to help provide an initial map of the cultural landscape of the Anthropocene, which I believe is an important first step to a better understanding of this emerging environmental concept.

Background

This geologic term can be translated as the Human Age or the Age of Man (*anthropo* = human and *cene* = new), and is an extension of the common geological practice of naming geologic epochs with a name and the suffix *cene*. We are currently living in the Holocene (“new whole”) epoch, which began approximately 11,000 years ago following the last ice age. This term officially entered public discourse in 2000, and was coined by American ecologist Eugene Stoermer and Dutch chemist Paul Crutzen. The Anthropocene was meant to formally capture the immense environmental changes which have taken place over the past 200 years of human activities, with particular emphasis on the impacts from increasing levels of CO². “For the past three centuries, the effects of humans on the global environment have escalated,” argues Crutzen. “Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behaviour for many millennia to come. It seems appropriate to assign the term ‘Anthropocene’ to the present, in many ways human-dominated, geological epoch, supplementing the Holocene — the warm period of the past 10–12 millennia.”ⁱⁱⁱ This idea of global impacts to the planet from human activities lies at the heart of the Anthropocene.

For its scientific originators, the Anthropocene attempts to capture the growing human impact on various geophysical processes across the entire planet (atmospheric, oceanic and terrestrial). In virtually every field of science today these changing impacts are evident, with environmental concerns having become a driving forces behind much modern science. Pick up any newspaper or scan the latest TV headlines, and environmental worries are sure to be among the top stories: food shortages, illegal logging, viral outbreaks, melting glaciers, species extinction, and natural resource wars—every day seems to bring a new set of headlines about the grim ecological state of our planet. Because of this, the desire to understand where our planet is headed in the future has become a driving force not only for scientists, but also in everyday politics, economics, religion and even popular culture. The idea of the Anthropocene attempts to capture these numerous changes and give them a scientific basis from which

we can better understand and evaluate their impacts, both positive and negative.

For others, the concept connects to long-standing a belief that there will be an inevitable global ecological collapse caused by continued human exploitation and indifference to the environment—what some have taken to calling an “ecopocalypse.” This is commonly imagined as a catastrophic collapse of modern industrial civilization, often linked to natural disasters or social collapse, such as rising oceans, flooding rivers, widespread crop failures, land disputes and even water wars. This theme has various historical roots, but the modern narrative of ecological collapse became dominant in the wake of the resurgent environmental movement of the early-to-mid 1960s in the United States. Although the average person may not come across terms like the Anthropocene or ecopocalypse in everyday life, most people intuitively grasp the main point, which is that human activities are harming the planet, and if we don't change how we act, things are probably going to get worse.

Exactly what we understand “worse” to imply varies immensely, often depending on a range of factors such as personal disposition (optimist or pessimist), religious views and party affiliations. With the exception of a small minority of the public, most of the American public is worried about the future of the planet. A 2011 Pew Research Center poll found continued majority support (63%) for the belief that global warming is real and happening.^{iv} Hotter summers, longer droughts, increased flooding, larger wildfires, rising sea levels and melting glaciers are all adding to these beliefs, further stoking public fears and driving home the reality of global warming. Yet even as environmental impacts are growing, overall public views about environmental problems appear to be shifting away from reality and towards highly partisan positions no longer grounded in reality. What can explain this paradox?

To understand this paradox, I argue the Anthropocene can be understood as more than just a technical term describing a series of geological changes to the planet. By analyzing the Anthropocene as a political concept that reaches beyond its scientific roots and into popular culture, additional layers of meaning can be revealed, much like a geologist exposing layers of hidden rock during an excavation.

By expanding the scope of the Anthropocene, I argue it can also be seen as signifying an emerging social order defined by new risks and uncertainties linked to the planet's Earth System.

My argument builds on the environmental risk literature of figures such as Mary Douglas, Ulrich Beck, Paul Slovic and John Adams. I argue that we can extend Beck's idea of the risk society through the framework of risk in the Anthropocene, using the ideas developed by Douglas, Slovic and Adams in relation to cultural risk. Not only are we producing new environmental risks, but these new risks are producing new cultural practices and beliefs, which then act as feedback mechanisms into our politics. Nowhere is this more evident than in the debates over climate change, which serves as the central focus of this project. I argue that by exploring popular culture, we can shed light on the paradox of political intransigence and public skepticism in the face of clear, global environmental risks.

Outline of Project

Chapter 1 begins with an investigation of the actual term as it first emerged within the scientific literature, and then traces the underlying construction of the scientific knowledge backwards in time to help us understand how this idea was able to emerge in its present form. This genealogy will take us back to the early 1600's, to a time when scientific studies of the natural world and the earth were beginning to change in important ways as the Middle Ages came to a close. During this time European thinkers hotly debated various "Theories of the Earth," as they eventually came to be known, in an attempt to discover the mysteries hidden with rocks, fossils, volcanoes and glaciers.

Central to this part of the story were the scholars and scientists who were making these new discoveries about the shape and origins of the earth, and the role that Christian theology played in shaping these debates and theories. By the 1800's various Biblical theories about the supposed age of the earth were being challenged and discarded, such as viewing the earth as only several thousands years old, explaining sediment and fossil layers as a function of the Great Flood (diluvian theories

based on the Bible) or arguing that geological formations were driven by single processes, centered on debates over Neptunism versus Plutonism and Uniformitarianism versus Catastrophism. We will explore these debates when we trace the scientific genealogy of the Anthropocene, as these seemingly settled debates from a century or more ago have gained a second life with the resurgence of Evangelical Christian attack on Darwinian evolution and climate science.

By reconsidering these earlier geologic debates, especially involving the figures of English theologian Thomas Burnett, and geologists James Hutton and Charles Lyell, I hope to shed light on the significance of these revived theological arguments for issues of environmental and earth science today. Burnet's *Telluris Theoria Sacra* (Sacred Theory of the Earth), first published in 1681, Hutton's *Theories of the Earth*, published in 1788, and Lyell's *Principles of Geology*, first published in 1830 are landmark texts that allow us to retrace this important transition from theological to secular views of Deep Time.

To give an example of why this is relevant to studying the Anthropocene, consider a September 2011 poll by the Public Religion Research Institute on views about climate change and evolution. The survey found that 38% of respondents do not believe in Darwin's theory of evolution, and of those 38% that doubted it, a full 50% also believe the earth was created in the last 10,000 years.^v What are the implications for environmental science or climate policies if we extend these findings to the entire US? It would mean that close to 40% of the American public (124 million people) rejects Darwin's theories about evolution, and 50% of this group, about 62 million people, think the planet is only 10,000 years old? Does that mean the Dome C ice cores from the East Antarctic ice shelf, which capture the last 740,000 years of climate activity, are seen as scientific fabrications by nearly half of the US public? If so, that is a truly troubling trend for climate science. By looking at how earlier religious arguments lost their hold on the public, we may gain important insights to why those same ideas are returning today.

Chapter 2 turns to the current context of the Anthropocene, and argues that we can understand the Anthropocene through discourses about the end of nature or post-environmental politics. From a

scientific term to *National Geographic* headline and YouTube video, I look at how the Anthropocene is being presented within popular discourse, and how this changing discourse reflects a re-thinking of earlier views about the relationship between nature and culture. I argue that these changes can be traced to at least two major trends. One has to do with the influence of science and technologies studies and arguments about the social construction of nature and wilderness in environmental theory circles. These arguments have helped to break down the older nature-culture divide, but have also been abused by some variants which risk turning nature into a mere social construct or text, rather than an actual physical reality which sustains all life on this planet.

This trend has been most clear in those liberal environmental discourses which seek to marry free market and modernization discourses with a deep faith in technology and human progress, a view often referred to as bright green environmentalism or shallow ecology, in contrast to deep ecology or dark green environmentalism, both of which tends to more radical critiques of technology and liberal free market solutions to environmental problems.

One example of bright green environmentalism can be found in the work of Ted Nordhaus and Michael Schellenberger, founders of The Breakthrough Institute and authors of the 2011 compilation *Love our Monsters: Postenvironmentalism and the Anthropocene*. Nordhaus and Schellenberger are no strangers to controversy. Their two earlier contributions to environmental politics, *Break Through: From the Death of Environmentalism to the Politics of Possibility* (2010) and *The Death of Environmentalism* (2004) earned them both strong rebukes from the environmental community for their defense of free market environmentalism and their techno utopian thinking regarding solutions to many contemporary environmental problems. One example of their environmental worldview can be found in their introduction to *Love our Monsters*:

By 2100, nearly all of us will be prosperous enough to live healthy, free, and creative lives. Despite the claims of Malthusian pessimists, that world is both economically and ecologically possible. But to realize it, and to save what remains of the Earth's ecological heritage, we must once and for all

embrace human power, technology, and the larger process of modernization.^{vi}

For Nordhaus and Schellenberger, as well as for some of their supporters, the environmental movement is destroying itself by its distrust of technology and markets, and its focus on environmental harm rather than human progress and success. Another example of this free market development logic comes from Peter Kareiva, who recently co-authored a piece for Nordhaus and Schellenberger's Breakthrough Institute journal titled "Conservation in the Anthropocene," where he makes the following argument:

If there is no wilderness, if nature is resilient rather than fragile, and if people are actually part of nature and not the original sinners who caused our banishment from Eden, what should be the new vision for conservation? It would start by appreciating the strength and resilience of nature while also recognizing the many ways in which we depend upon it. Conservation should seek to support and inform the right kind of development -- development by design, done with the importance of nature to thriving economies foremost in mind. And it will utilize the right kinds of technology to enhance the health and well-being of both human and nonhuman natures. Instead of scolding capitalism, conservationists should partner with corporations in a science-based effort to integrate the value of nature's benefits into their operations and cultures. Instead of pursuing the protection of biodiversity for biodiversity's sake, a new conservation should seek to enhance those natural systems that benefit the widest number of people, especially the poor...Nature could be a garden -- not a carefully manicured and rigid one, but a tangle of species and wildness amidst lands used for food production, mineral extraction, and urban life.^{vii}

If only the greens would embrace capitalism and technology, and stop pretending they are living in a Waldenesque transcendental wilderness, then America could become a beacon of environmental hope for the world, they argue. All the eco doom and gloom and human hating, they variously argue, is at the root of the real green problem, and helps to explain why many people are skeptical of green politics. By looking at the claims of Nordhaus, Schellenberger, Kareiva, Ellis and others making these bright green environmental arguments, I will highlight how this line of environmental discourse is operating within the Anthropocene, as well as its relationship to the questions of science, technology, risk and culture.

The other dominant line of thinking around post-environmental or end of nature arguments is the one which wants to deconstruct rhetoric which continues to paint the environmental problem as one of people harming a distinct and external nature, and in this sense there is a common agenda with the bright green agenda. But where many of this second camp diverge is in their diagnosis of the problems,

and their arguments about how to rethink environmental or ecological politics.

For example, Bruno Latour, one of the leading figures in science and technology studies (STS) and Continental political theory, appears among the names in the *Love our Monsters* book. One of his recent works was called *The Politics of Nature*, where he made a strong case for erasing the human-nature divide while restating some of his earlier ideas around a parliament of things, non-human actants and the ideas of group or collective politics. Latour also jumped onto the Anthropocene bandwagon, as his remarks at the annual meeting of the British Sociological Association in 2007 illustrate.^{viii}

How can we read in the newspapers that “we” as humans might be responsible for 30 or 40% of species extinction, without this effecting a change in our “identity” and our “relationships”? How can we remain unmoved by the idea that we are now as dangerous to our life support system as the impact of a major meteorite? How can we have the same definition of ourselves, now that all the terms which earlier were metaphorical (terms like “upheavals”, “tectonic shift”, and “revolutions”) have become literal: yes indeed, collectively we are just as powerful as what caused three or four other mass extinctions — and some scientists use the word Anthropocene to describe this new geological era. Do you feel proud of that? Some might, actually: so big, so mighty! But how can this feeling be reconciled with the opposite one: we are so little, so powerless, a mere scratch on the surface of the Earth? How could we be capable of war crimes of such proportion and yet so absolutely despondent? “I did nothing, I followed the orders”. Is this discrepancy — between the immensely big and powerful, and the immensely weak and puny — not one of the reasons why we keep reading all of this literature on ecological crisis without really believing in it?^{ix}

And although Latour has his own set of problems, I believe he is an important thinker raising questions about the intersections of political ecology, science and democracy, as well as linking these discourses back to our central focus on the Anthropocene and questions of cultural fears and risks.

In a somewhat different vein, and also skeptical of liberal environmental politics, are figures like Bill McKibben and Will Steffan, who both offer a more critical take on what the real problems of environmentalism are today. For McKibben, the end of nature is not something to celebrate because it signifies what the Anthropocene was coined to describe—a planet increasingly shaped by human industrial impacts that are largely destructive and come at increasing costs to most life on the planet. As McKibben writes in *Eaarth*, one of his latest books, “global warming is no longer a philosophical threat, no longer a future threat, *no longer a threat at all*. It's our reality. We've changed the planet,

changed it in large and fundamental ways.”^x McKibben is the founder of the 350 political group, and has been a vocal campaigner for reducing global CO² levels to 350 ppm, considered by many climate scientists to be one possible ecological threshold to stay under if we are to avoid increased runaway climate-related changes to the planet.^{xi} Likewise McKibben took Anthropocene booster and liberal bright green environmental scientist Erle Ellis to task for a piece he published on the Anthropocene called “The Planet of No Return,” where Ellis imagines a happy future of humans dominating the planet. To this rosy view McKibben replies that when you “ignore both scientific prediction and real-time data, cheerfulness about a globally warmed world comes easy.”^{xii}

And just as there are scientists like Ellis who support a utopian and market oriented environmental reading of the Anthropocene, there are others who share the worried future outlook, and see the Anthropocene as one way to try and see the big picture science (and politics) behind this issue. For example, the March 2012 issue of *Global Change*, the newsletter of the International Geosphere-Biosphere Program, was dedicated to the Anthropocene, and one article suggested the Anthropocene is a better scientific framework than climate change to help us think about all these various dynamics:

But the former [Anthropocene] is a more effective paradigm in describing the cumulative impact of civilisation, making global warming and its consequences but one of many ways in which humans have modified the Earth. Narrow focus on global warming might suggest that we simply need to stop emitting greenhouse gases and use renewable energy to abate the planet's pressures. The human footprint is much larger than that.^{xiii}

It is precisely this more holistic view which makes the Anthropocene exciting as a new environmental paradigm to me, because in many ways it echoes longstanding claims of deep ecologists and others whose perspective always saw the world as connected and interdependent in ways which the dominant European legacy of Cartesian and Newtonian science were, and still are, hostile to. This slow but growing challenge to Anglo-American scientific worldviews can be traced across many fields, but in the discourse of the Anthropocene it has a natural home.

These scientific trends are being driven in part by shifts in popular culture and society, where

formerly hegemonic ideas about economics, politics, philosophy and religion are increasingly being challenged. Some of these broad trends include: the questioning of human dominance of the planet (ie. anthropocentrism); the continued failures of a global capitalist economic system solely concerned with increasing profits to deal with emerging financial risks; a growing skepticism about the historical narrative of nature versus civilization, evident in current debates about the “end of nature,” and the rise of post-natural environmental discourses; the rise of posthuman and transhuman inquiries into the relationship between synthetic and organic life and hierarchies of life (cybernetics, artificial intelligence, synthetic biology); and finally the growing influence of industrial technologies which allow formerly unimaginable technologic interventions into our everyday world (genetic engineering, biotechnology, hydraulic fracturing).



All of these trends are helping to drive these emerging postnatural or end of nature discourses which the Anthropocene is also a part of. As Jan Zalasiewicz, a prominent Anthropocene geologist argues, “the Anthropocene represents a new phase in the history of both humankind and of the Earth, when natural forces and human forces became intertwined, so that the fate of one determines the fate of the other.”^{xiv} Although coming with a slightly different focus, this sentiment shares much in common with Donna Haraway's arguments about how a naturalcultural perspective can help us to further blurs species boundaries and break out of these dichotomies of nature versus culture. As Zalasiewicz implies, our earlier distinctions between environmental risk and technologic risk are increasingly making less sense to more people as the two have begun to merge into a singular form of risk.

How these political dynamics are influencing the Anthropocene discourse will be an important question for us to consider, particularly as it relates to the movement back and forth between science and politics in society. Here Ulrich Beck's notion of reflexive scientization will be important to explore,

as his point about the influence of cultural push back against science illustrates some of the dynamics we are witnessing today. For example, on the one hand climate and evolutionary science debates are being increasingly driven by religious ideology rather than science. On the other hand, critiques of industrial science and technology are coming from environmentalists and skeptics who question the very model of industrial science which produces genetically engineered animals, transgenic crops and a commercial model of science driven by more advanced forms of exploitation of the natural world.

By examining these Anthropocene discourses we can gain critical insights into these dynamics, helping us to understand how they are translated by scientists as well as the larger public. This requires that we look at the Anthropocene discourse broadly, including its textual, visual and symbolic forms. Each expression of the Anthropocene reveals a slightly different understanding of its significance, and I argue that this symbolic dimension is central to our hyper mediated modern world. Because of this, the concerns triggered by Anthropocene science will be visible in our cultural myths, symbols and fears.

Chapter 3 moves from a general exploration of Anthropocene discourse to focus specifically on the changing notions of risk in the Anthropocene. As Ulrich Beck, Mary Douglas, Paul Slovic and other scholars of risk have argued, the logic of risk pervades modern society, from consumer safety laws and financial markets to environmental science and questions of national security. Beck takes the common understanding of risk a step further, arguing that risk is actually a defining feature of modern industrial society, and I will develop this idea further by showing how it continues to change under the current influences of the Anthropocene, thereby bringing some of Beck's arguments more up to date.

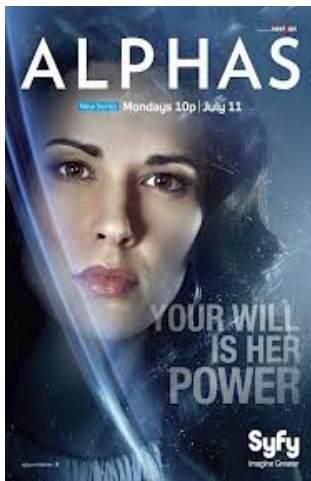
Beck suggests, and I agree, that the influences of modernization have fundamentally changed our relationship to risk. Whereas wealth creation once drove concerns about risk, today it is risk production which drives wealth production. He calls this process reflexive modernization, which entails the breakdown of former social structures and norms under the pressures of a global model of industrial capitalism. As he argues, “productive forces have lost their innocence in the reflexivity of

modernization processes. The gain in power from techno-economic 'progress' is being increasingly overshadowed by the production of risks.^{xxv} We saw this argument illustrated spectacularly in the most recent economic crash of 2007-2008, which was a direct result of the compounding spiral of risk on top of risk on top of more risk, until the whole speculative bubble burst with devastating economic results. But what Beck misses in his analysis, and what I draw out in my argument, is that not only has our relationship to risk changed, but the very meaning of risk itself has fundamentally changed today.

To examine how the Anthropocene is influencing our thinking about risk, I turn my analysis to popular culture and examine some of the dominant examples of risk and fears about the future. I do this by looking at the fears embedded in our pop culture fantasies and nightmares about environmental catastrophes and zombie apocalypses, global virus outbreaks and killer machine invasions. All of these stories rely on a narratives involving man versus machine, nature versus technology, or humans versus nonhumans, where one is always in conflict with the other. These narratives are often defined by their use of some border crossing figure, oftentimes a monster, who stands in as the embodiment of risk.

In one version, the rise of this monster (a real creature or a machine) is subverted at the decisive moment by a mix of human ingenuity and good fortune. We find examples of this narrative repeated in current popular films like *Resident Evil*, *Captain America* and *Transformers*, and in TV series like *The Walking Dead*, *Dr. Who* and *Heroes*. Yet even here this mythic narrative is increasingly being troubled as the line between the good human and the bad monster is growing increasingly blurry. This tension is evident, for example, in *The Walking Dead* story where the lead character Rick Grimes, a former small town Kentucky sheriff, finds himself stuck between nonhuman zombies, inhuman humans and a landscape of industrial collapse. As Doctor Edwin Genner tells the group in episode six of *The Walking Dead*: “Listen to your friend. She gets it. This is what takes us down. This is our extinction event.”^{xxvi} So what happens when the things that formerly defined us as human—our civilization, our technology or our compassion for our species—become meaningless, or worse, obstacles to our survival in the face of

an uncontrollable global pandemic or seemingly unstoppable evil?



In another version of cultural narrative, it is the monsters who are fighting to survive, and the humans become the source of risk. We can see this narrative in a show like *True Blood*, the HBO adaptation of the Sookie Stackhouse vampire novels by Charlaine Harris. In the current arc of the story, the spectre of an all out war between humans and vampires is looming, and many characters who identify as neither—witches, shifters, fairies and werewolves—appear to be caught in the posthuman crossfire. Likewise the

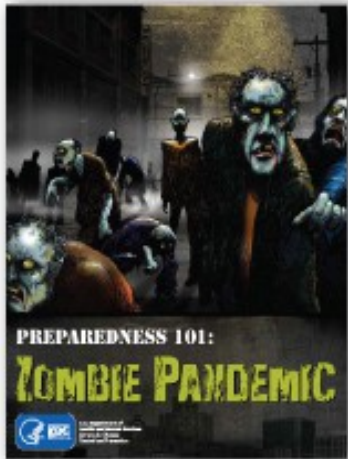
SyFy TV series *Alphas*, which set a new channel record with “2.5 million total viewers,” earning *Alphas* the title of “most-watched and highest-rated” SyFy series to date, is driven by a story of posthuman persecution, the Alphas, at the hands of ordinary humans.^{xvii} Alphas have powers that humans don't, and therefore are seen as a risk that must be controlled, or in the case of “dangerous” Alphas, institutionalized at a secret government lab known as Binghamton. These narratives parallel some of the same political debates which have taken place over human enhancements and cybernetics, and the fear of a future of engineered superhumans.

And between the downtrodden superhuman trope and the zombie apocalypse is another fear, the viral pandemic. One of the best examples of this narratives in pop culture can be found in the growing series of apocalypse survival shows on TV. One such clear example is the Discovery Channel show *The Colony*, a two season series which puts a group of people together in a post viral apocalyptic scenario—first in Los Angeles, and then in New Orleans—and sees if they are able to survive. As one *Time* reviewer noted, it has all the makings of our worst future fears packaged for easy TV viewing.

It draws on (and references) recent news fears: “We are on the edge of a global catastrophic disaster,” it begins. “Human conflict, nuclear bombs, natural disasters, chemical and biological warfare. Without warning, the world as we know it can come to an end.” Thanks for the reminder!^{xviii}

But the zombie narratives in particular, I argue, is where the most clear cultural overlap with

Anthropocene science is taking place, especially the varying scenarios of global ecological catastrophe from runaway climate change. Here the zombie apocalypse is acting as a symbolic placeholder for our fears of a global collapse of civilization, regardless of whether it is caused by climate, plague or some other force. Even more significant, I argue the zombie has become the symbolic figure *par excellence* for trying to cope with the new risks unleashed by human interventions into our world. Zombie narratives are literally popping up everywhere like the dead rising in the stories. From international relations textbooks and critiques of casino capitalism to Eurozone zombie banks and even National Guard sponsored zombie pandemic survivalist competitions, we seem to be projecting all of our fears about the future onto monsters, especially zombies. Even the Center for Disease Control and Prevention, the CDC, has a zombie preparedness website and zombie comic, *Preparedness 101: Zombie Pandemic*.^{xix}



How we depict these monsters in our popular mythology, and the cultural risks they are made to embody, reveal far more than we might realize about what risks we truly fear. What all of these popular media share in common is an existential angst, a belief that we are losing grip of our world and our future to forces beyond our control, be they ecological, biological or technological. These cultural fears parallel the scientific fears embedded in the dominant ecological understanding of the Anthropocene as a rapid speeding up and destabilizing process of the planet's Earth Systems, leading to an unknown future defined by the increased likelihood of unpredictable and random catastrophic events. As our understanding of the science of the Anthropocene grows, so do our fears about risk. Examining these depictions will help us better understand the new forms of cultural risk that are being produced today.

Chapter 4 steps back from the question of risk and popular culture and asks what are the

underlying worldviews producing these fears? Before we can identify something as a risk or a threat, we need an evaluative framework which allows us to make these determinations. Those deeper value frames are in turn a function of socialization, personal values and philosophical ethics. In order to understand these dynamics we must turn to the issue of faith and its role in the Anthropocene.

By faith I mean both the religious usage, understood as placing absolute trust in a deity or supreme being(s), as well as the secular usage, taken to mean some established regime of truth, usually linked to scientific knowledge about the empirical world. Both understandings of faith are critical to the Anthropocene. One of the major ideological struggles underlying the Anthropocene comes down to a question of faith—in other words, what constitutes the basis of validity for our truth claims?

Do we have faith in climate scientists and their projections for what will happen in the future as global mean ocean temperatures rise 2-3° C, or do we have faith that climate change is all a part of God's plan, and thus not something we should, or even could, try to stop? Is climate change just the next stage in the approaching Armageddon? While some people might easily dismiss such remarks, I argue taking them seriously is central to understanding American culture, as well as seeing how earlier religious and scientific views that were considered settled are now returning to haunt us again today. As Matthew Gross and Mel Gilles argue in *The Last Myth*, seeing “the apocalypse as an explanatory narrative for the accelerating changes facing us in the twenty-first century helps us to understand the apocalypse's predominance in our culture and its application by ordinary people to a range of issues, from the collapse of the housing bubble to the threat of epidemic. It also explains why so many people, dissatisfied by the current state of our nation and culture, turn to the apocalypse and its signs as both a vindication and a consolation.”^{xx} And as Gross and Gilles point out, this thinking applies equally to ecological and Biblical narratives about the coming end times.

To delve deeper into this question, this chapter examines the rise of Christian fundamentalism and its increasing attacks on modern science, especially climate science and evolutionary biology. This

is done through an analysis of several creationist science textbooks published by Bob Jones University, as well as the *Resisting the Green Dragon* book and video series produced by the Cornwall Alliance, a hybrid free market, fundamentalist think tank which is a key player in the conservative landscape. How should we read arguments claiming that environmentalism is a new pagan religion, and climate science is largely biased secular science with a hidden environmental political agenda? Consider the following example, taken from the *Earth Science* textbook published by Bob Jones University I will examine:

A Christian worldview, based as it is on the Creation Mandate, requires us to approach the global warming question carefully, as with any problem when pursuing dominion. Christians should not deny that global warming might be occurring. We should not think that no climate scientist could report true observations. We must fully support solid, well-reasoned scientific research. Christians should expect that the real difference between themselves and radical environmentalists would be in the way we humans respond to evidence for global warming. But at this point in time, we really don't have enough evidence to decide if global warming is really happening, whether humans cause it or not, and whether the earth's systems can control the change.^{xxi}

It is hard to imagine a serious scientific textbook on earth science being published in 2012 and claiming that “at this point in time, we really don't have enough evidence to decide if global warming is really happening,” yet that is precisely what students are being taught who will use this science text. But what is particularly fascinating is the apparent contradiction within the text. The reader is told that “Christians should not deny that global warming might be occurring” and that they “must fully support solid, well-reasoned scientific research,” yet the conclusion presented in the text, with no evidence to support it, is that we “don't have enough evidence to decide if global warming is really happening.” Trying to understand this logic will require us to ask, what evidence would be required to have faith in the climate evidence for human caused change, and how can this be reconciled with the international scientific consensus that climate change is real, is human caused, and is spiralling out of control?

But it is not only in these religious realms that questions of faith matter. We also see similar debates manifesting in defense of the modern industrial political order and global capitalism. There is a dogmatic faith on the part of technophiles and free market advocates that free markets and innovation will solve all our problem, now and in the future. Yet this absolute faith in the free market has proven

disastrous in recent years. As John Lanchester points out in his book on the 2008 crash, *I.O.U.*, these economic failures are part of “a deeper embarrassment, one which verges on a form of psychological or ideological crisis. The huge bailouts of major financial institutions means that the Anglo-Saxon model of capitalism has failed.”^{xxii} Yet without an alternative model, which he and many others have argued is missing today, what are the alternatives? This near-absolute faith in markets and technology has a long history that is of central interest to us because it plays an important role in Beck's “risk society,” and it goes a long way towards explaining the philosophical obsession, especially in the United States, with technologic solutions to any and all problems.

As Neil Postman writes in *Technopoly*, “in cultures that have a democratic ethos, relatively weak traditions, and a high receptivity to new technologies, everyone is inclined to be enthusiastic about technological change, believing that its benefits will eventually spread evenly among the entire population...this naïve optimism is exploited by entrepreneurs, who work hard to infuse the population with a unity of improbable hope, for they know that it is economically unwise to reveal the price to be paid for technological change.”^{xxiii} Such dynamics would not be possible without the underlying faith in technology which makes such a reality possible, a faith which Postman rightly points out has both its positives and its negatives. The same earth science technologies which allow us to measure and predict the future impacts of warming oceans or model increasing tropical storm activity also allows us to drill deep ocean oil and gas wells or conduct complex hydraulic fracturing operations miles underground.

To understand these activities is to understand the underlying models and practices which constitute the field of knowledge from which these technologies emerge, a part of which concerns our faith in the models of how technology operates, or is supposed to operate, in the real world. The reason we can drill for gas a mile under the ocean floor, or predict the movement of an earthquake or volcano, is because we have faith in the models of the world we have constructed in order to allow us to then intervene into that model of our world. Whether or not our models actually reflect reality, and why we

accept of reject one model over another, goes to the heart of what we mean when we talk about faith.

As it specifically relates to questions of science, faith in the Anthropocene implies a certain set of knowledge claims—that we can measure geologic time; that we can measure human impacts apart from nonhuman effects; that we can measure changes in our environment accurately; that we can intervene in the world around us with a high degree of certainty and control. Without faith in these basic assumptions about the world, we would not be able to construct a scientific worldview. As H. Richard Niebuhr wrote in discussing the ways that scientific faith resembles religious faith:

Our twentieth century is an age of confidence in science. In our culture we tend to believe scientists as, we are told, in another age of faith men believed churchmen. To be sure, we call the content of what we now believe knowledge or science, but for the most part it is direct knowledge only for the scientific specialist while for the rest of us it is belief—something taken on trust.^{xxiv}

And as Stanley Tambiah points out in discussing various critiques of scientific rationality, when science “makes claims, or is used to legitimate claims, to regulate the larger socio-politico-economic-moral life, it is in fact an “ideology” in the double sense—of masking the interests that back it, and of legitimating those interests at the same time” (Tambiah 147). How should we make sense of science in this landscape of religious and ideological debate, and where do science and faith part company if a growing segment of the American public hold conservative or even fundamentalist scientific views?

Chapter 5 delves deeper into the role of technology by bringing us back full circle to the Anthropocene and contemporary debates over technology-based solution to climate change. Of all the various solutions proposed so far for dealing with climate change, geoengineering is the most visible of the techno-fixes on the table. Geoengineering offers a good example of how technology is framed as both a solution and a danger within discourses about environmental interventions in the Anthropocene. It is also an example of the public contestation over science, or what Beck calls reflexive scientization, as there has been significant debates already over the scientific merits and safety of such techniques.

For example, a 2010 Congressional Committee on Science and Technology report on

Geoengineering called *Engineering The Climate: Research Needs And Strategies For International Coordination*, framed the issue in the following way:

As this subject becomes the focus of more serious consideration and scrutiny within the scientific and policy communities, it is important to acknowledge that climate engineering carries with it not only possible benefits, but also an enormous range of uncertainties, ethical and political concerns, and the potential for harmful environmental and economic side effects...However, we are facing an unfortunate reality. The global climate is already changing and the onset of climate change impacts may outpace the world's political, technical, and economic capacities to prevent and adapt to them. Therefore, policymakers should begin consideration of climate engineering research now to better understand which technologies or methods, if any, represent viable stopgap strategies for managing our changing climate and which pose unacceptable risks.^{xxv}

For some advocates of geoengineering, especially those already prone technologically inclined, it is seen as a solution which could provide a relatively quick and fairly cost effective solution to the problem of too much CO² in the atmosphere. It is also a perfect example of the sort of free market ideas typical of bright green environmentalism, where the underlying philosophy is that of perpetual progress and advancements from technology and markets.

A typical response along these lines came from Baker Institute energy analyst Amy Jaffe on the May 2010 *PBS Newshour* show discussing the Gulf oil spill. “Well, you know, we, in the American public, we are a big believer that there's a science and technology solution to everything -- everything.”^{xxvi} Not surprisingly, this type of solution for climate change is popular among the climate denial corporate crowd, as it provides a way to continue ignoring fossil fuel consumption issues and alternative energy discussions while appearing to make a nod to climate change as a serious issue that requires a solution.



For many climate scientists, geoengineering is seen as a last resort, worst case solution. While

there is considerable skepticism as to whether the various ideas being proposed will work, there is a feeling, visible in the Congressional report cited above, that we need to at least understand the basic mechanisms at work in case we find ourselves in a situation where using geoengineering becomes the option of last resort. Even one of the coiners of the term Anthropocene, Paul Crutzen, has suggested that climate scientists need to consider geoengineering, an argument he advanced in a co-authored article in the 2008 issue of *Geophysical Research Letters* titled “Exploring the geoengineering of climate using stratospheric sulfate aerosols: The role of particle size.” The authors suggest that:

To reduce carbon dioxide emissions soon enough to avoid large and undesirable impacts requires a near-term revolutionary transformation of energy and transportation systems throughout the world (Hoffert et al. 1998). The size of the transformation, the lack of effective societal response and the inertia to changing our energy infrastructure motivate the exploration of other strategies to mitigate some of the planetary warming. For this reason, geoengineering for the purpose of cooling the planet is receiving increasing attention.^{xxvii}

For those more skeptical of technologic solutions to environmental problems, the idea of geoengineering is a non starter, even while acknowledging that immediate solutions are in short supply. For geoengineering opponents, it personifies the height of human arrogance and attempts to dominate the planet with unproven technologies promising to magically fix climate change and save the world. A clear example of this push back came from the *Guardian* columnist John Vidal, who ripped apart a 2011 *Task Force On Climate Remediation Research* report published by the Bipartisan Policy Center (BPC), which called for major government funding for geoengineering research in the United States.

The operation is part-funded by big oil, pharmaceutical and biotechnology companies, and while it claims to "represent a consensus among what have historically been divergent views," it appears to actually represent the most powerful US academic, military, scientific and corporate interests. It lobbies for free trade, US military supremacy and corporate power and was described recently as a "collection of neo-conservatives, hawks, and neoliberal interventionists who want to make war on Iran"...Their specially convened taskforce is, in fact, the cream of the emerging science and military-led geoengineering lobby with a few neutrals chucked in to give it an air of political sobriety.^{xxviii}

As we can see, the issue has strong advocates on both sides, thereby providing us a rich site for exploring our themes of risk and faith in the Anthropocene. The net effect of adopting any widespread

geoengineering techniques would be to push the envelop of human interventions in the Earth System to a new extreme. Humans would then be actively attempting to manipulate our climate, rather than the present practice of indirect and unintended climate manipulation, mostly from increasing CO² levels.

By exploring these debates over geoengineering, we can see how different risks are framed, what forms of faith are operative behind these scientific and technologic arguments, and how they relate to the larger cultural politics of the Anthropocene. Geoengineering is also likely to become a serious political debate in the coming years given the complete lack of other serious solutions to deal with climate change. Therefore it is quite likely that some form of climate geoengineering will gain traction as a techno-fix for dealing with climate change, especially for countries like the US who refuse to deal with the growing threat of climate change through other avenues.

By considering the Anthropocene through the lens of risk and faith, and exploring how these ideas are manifesting in popular culture, religious discourse and environmental politics, I offer an initial conceptual mapping of contemporary Anthropocene discourses. By examining the dynamic interplay of religion and science, risk and technology through the lens of popular culture, I hope to offer additional insights into how we might deal with these conflicts at the heart of environmental politics today. Ultimately the idea of the Anthropocene is here to stay, whether or not the name is formalized as a geologic epoch at some point in the future. Being able to better understand how this emerging discourse is shaping the future of environment politics is key to not only navigating our collective ecological future, but also for assessing the places where political change is more or less likely to occur. It will also mean thinking through some hard questions, such as if there is a role for fundamentalist religious views in the sciences, and whether capitalism and technology can offer real solutions to growing climate change problems, or if they are ultimately the real root cause. Resolving these debates meaning getting to the heart of what it means to be living in the Anthropocene.

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- i Christopher Podeschi. "From Earth to Cosmos" in *Cinematic Sociology*. Jean-Anne Sutherland and Kathryn Feltey, Eds. Pine Forge Press. 2010. pg. 241.
- ii cf: Robert Brulle, 1996 and 2000, Marvin Olsen et al. 1992, Braden Allenby 2011, Michele Willson 2006, Michael Huesemann and Joyce Huesemann 2011.
- iii Paul Crutzen. "Geology of Mankind." *Nature* 415. 2002.
- iv [http://pewresearch.org/pubs/2137/global-warming-environment-partisan-divide-](http://pewresearch.org/pubs/2137/global-warming-environment-partisan-divide)
- v <http://publicreligion.org/site/wp-content/uploads/2011/10/September-PRRI-RNS-Topline-Questionnaire-and-Survey-Methodology-.pdf>
- vi Nordhaus and Schellenberger. *Love our Monsters*.
- vii <http://thebreakthrough.org/index.php/journal/past-issues/issue-2/conservation-in-the-anthropocene/>
- viii This quote follows a discussion of James Lovelock and his *Gaia's Revenge* book, where Latour is discussing the implications of Lovelock's predictions about a massive ecological catastrophe and population decline in the near future.
- ix Bruno Latour. A Plea for Earthly Science. 2007. http://www.bruno-latour.fr/sites/default/files/102-BSA-GB_0.pdf
- x Bill McKibben. *Eaarth*. <http://www.billmckibben.com/eaarth/excerpt.html>
- xi The Science of 350. <http://350.org/en/about/science>
- xii Bill McKibben. Cheap Fantasy. <http://thebreakthrough.org/index.php/journal/debates/planet-of-no-return-a-breakthrough-debate/erle-elliss-cheap-fantasy/>
- xiii Global Change. 'Anthropocene: The Geology of Humanity.' Vol 78: March 2012. pg. 14.
- xiv Jan Zalasiewicz. 'New World of the Anthropocene.' *Environmental Science & Technology*: 44. 2010. pg. 2228.
- xv Ulrich Beck. Risk Society. pg. 12. 1992.
- xvi The Walking Dead. TS 19. <http://www.screened.com/rick-grimes/15-5059/quotes/>
- xvii <http://tvbythenumbers.zap2it.com/2011/07/12/alphas-is-syfys-most-watched-debut-in-two-years-eureka-warehouse-13-premiere-ratings/97819/>
- xviii Review of Discovery's Apocalyptic Reality Show The Colony. <http://entertainment.time.com/2009/07/21/tv-tonight-the-colony/#ixzz25HUb8dEC>
- xix http://www.cdc.gov/phpr/zombies_novella.htm.
- xx Matthew Gross and Mel Gilles. *The Last Myth*. 2012.
- xxi Terrance Egolf and Rachel Santopietro. *Earth Science*. 4th Ed. 2012.
- xxii John Lanchester. *I.O.U.* 2010.
- xxiii Neil Postman. Technopoly. Pg 11. 1993.
- xxiv Helmut Richard Neibuhr. Radical Monotheism and Western Culture. pg. 79. 1970.
- xxv Committee on Science and Technology Congressional Report. *Engineering The Climate: Research Needs And Strategies For International Coordination*. 2010.
- xxvi PBS Newshour. http://www.pbs.org/newshour/bb/environment/jan-june10/oil2_05-31.html
- xxvii Rasch, P. J., P. J. Crutzen, and D. B. Coleman (2008), Exploring the geoengineering of climate using stratospheric sulfate aerosols: The role of particle size, *Geophys. Res. Lett.*, 35.
- xxviii John Vidal. <http://www.guardian.co.uk/environment/blog/2011/oct/06/us-push-geoengineering>