*This is an abridged version of the full paper by Jem Bendell; to read the complete document (including references), please visit lifeworth.com/deepadaptation.pdf. Analysis of the original paper found at scientistswarning.org/wiki/deep-adaptation-agenda/ has been provided following Bendell’s article to deepen understanding and conversation.*

**Deep Adaptation: A Map for Navigating Climate Tragedy**

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Professor Jem Bendell BA (Hons) PhD

# Abstract

The purpose of this conceptual paper is to provide readers with an opportunity to reassess their work and life in the face of an inevitable near- term social collapse due to climate change.

The approach of the paper is to analyse recent studies on climate change and its implications for our ecosystems, economies and societies, as provided by academic journals and publications direct from research institutes.

That synthesis leads to a conclusion there will be a near-term collapse in society with serious ramifications for the lives of readers. The paper reviews some of the reasons why collapse-denial may exist, in particular, in the professions of sustainability research and practice, therefore leading to these arguments having been absent from these fields until now.

The paper offers a new meta-framing of the implications for research, organisational practice, personal development and public policy, called the Deep Adaptation Agenda. Its key aspects of resilience, relinquishment and restorations are explained. This agenda does not seek to build on existing scholarship on “climate adaptation” as it is premised on the view that social collapse is now inevitable.

The author believes this is one of the first papers in the sustainability management field to conclude that climate-induced societal collapse is now inevitable in the near term and therefore to invite scholars to explore the implications.

# Reader Support

A list of readings, podcasts, videos and networks to support us in our emotional responses to the information contained in this paper is available at [www.jembendell.com](http://www.jembendell.com/)

# Introduction

Can professionals in sustainability management, policy and research – myself included - continue to work with the assumption or hope that we can slow down climate change, or respond to it sufficiently to sustain our civilisation? As disturbing information on climate change passed across my screen, this was the question I could no longer ignore, and therefore decided to take a couple of months to analyse the latest climate science. As I began to conclude that we can no longer work with that assumption or hope, I asked a second question. Have professionals in the sustainability field discussed the possibility that it is too late to avert an environmental catastrophe and the implications for their work? A quick literature review revealed that my fellow professionals have not been publishing work that explores, or starts from, that perspective. That led to a third question, on why sustainability professionals are not exploring this fundamentally important issue to our whole field as well as our personal lives. To explore that, I drew on psychological analyses, conversations with colleagues, reviews of debates amongst environmentalists in social media and self- reflection on my own reticence. Concluding that there is a need to promote discussion about the implications of a social collapse triggered by an environmental catastrophe, I asked my fourth question on what are the ways that people are talking about collapse on social media. I identified a variety of conceptualisations and from that asked myself what could provide a map for people to navigate this extremely difficult issue. For that, I drew on a range of reading and experiences over my 25 years in the sustainability field to outline an agenda for what I have termed “deep adaptation” to climate change.

The result of these five questions is an article that does not contribute to one specific set of literature or practice in the broad field of sustainability management and policy. Rather, it questions the basis for all the work in this field. It does not seek to add to the existing research, policy and practice on climate adaptation, as I found that to be framed by the view that we can manage the impacts of a changing climate on our physical, economic, social, political and psychological situations. Instead, this article may contribute to future work on sustainable management and policy as much by subtraction as by addition. By that I mean the implication is for you to take a time to step back, to consider "what if" the analysis in these pages is true, to allow yourself to grieve, and to overcome enough of the typical fears we all have, to find meaning in new ways of being and acting. That may be in the fields of academia or management - or could be in some other field that this realisation leads you to.

First, I briefly explain the paucity of research that considers or starts from social collapse due to environmental catastrophe and give acknowledgement to the existing work in this field that many readers may consider relevant. Second, I summarise what I consider to be the most important climate science of the last few years and how it is leading more people to conclude that we face disruptive changes in the near-term. Third, I explain how that perspective is marginalised within the professional environmental sector – and so invite you to consider the value of leaving mainstream views behind. Fourth, I outline the ways that people on relevant social networks are framing our situation as one of facing collapse, catastrophe or extinction and how these views trigger different emotions and ideas. Fifth, I outline a “Deep Adaptation Agenda” to help guide discussions on what we might do once we recognise climate change is an unfolding tragedy. Finally, I make some suggestions for how this agenda could influence our future research and teaching in the sustainability field.

As researchers and reflective practitioners, we have an opportunity and obligation to not just do what is expected by our employers and the norms of our profession, but also to reflect on the relevance of our work within wider society. I am aware that some people consider statements from academics that we now face inevitable near-term social collapse to be irresponsible due to the potential impact that may have on the motivation or mental health of people reading such statements. My research and engagement in dialogue on this topic, some of which I will outline in this paper, leads me to conclude the exact opposite. It is a responsible act to communicate this analysis now and invite people to support each other, myself included, in exploring the implications, including the psychological and spiritual implications.

# Our Non-Linear World

This paper is not the venue for a detailed examination of all the latest climate science. However, I reviewed the scientific literature from the past few years and where there was still large uncertainty then sought the latest data from research institutes. In this section I summarise the findings to establish the premise that it is time we consider the implications of it being too late to avert a global environmental catastrophe in the lifetimes of people alive today.

The simple evidence of global ambient temperature rise is undisputable. Seventeen of the 18 warmest years in the 136-year record all have occurred since 2001, and global temperatures have increased by 0.9°C since 1880 (NASA/GISS, 2018). The most surprising warming is in the Arctic, where the 2016 land surface temperature was 2.0°C above the 1981-2010 average, breaking the previous records of 2007, 2011, and 2015 by 0.8°C, representing a 3.5°C increase since the record began in 1900 (Aaron- Morrison et al, 2017).

This data is fairly easy to collate and not widely challenged, so swiftly finds its way into academic publications. However, to obtain a sense of the implications of this warming on environment and society, one needs real- time data on the current situation and the trends that it may infer. Climate change and its associated impacts have, as we will see, been significant in the last few years. Therefore, to appreciate the situation we need to look directly to the research institutes, researchers and their websites, for the most recent information. That means using, but not relying solely on, academic journal articles and the slowly produced reports of the Intergovernmental Panel on Climate Change (IPCC). This international institution has done useful work but has a track record of significantly underestimating the pace of change, which has been more accurately predicted over past decades by eminent climate scientists. Therefore, in this review, I will draw upon a range of sources, with a focus on data since 2014. That is because, unfortunately, data collected since then is often consistent with non-linear changes to our environment. Non-linear changes are of central importance to understanding climate change, as they suggest both that impacts will be far more rapid and severe than predictions based on linear projections and that the changes no longer correlate with the rate of anthropogenic carbon emissions. In other words - ‘runaway climate change.’

The warming of the Arctic reached wider public awareness as it has begun destabilizing winds in the higher atmosphere, specifically the jet stream and the northern polar vortex, leading to extreme movements of warmer air north in to the Arctic and cold air to the south. At one point in early 2018, temperature recordings from the Arctic were 20 degrees Celsius above the average for that date (Watts, 2018). The warming Arctic has led to dramatic loss in sea ice, the average September extent of which has been decreasing at a rate of 13.2% per decade since 1980, so that over two thirds of the ice cover has gone (NSIDC/NASA, 2018). This data is made more concerning by changes in sea ice volume, which is an indicator of resilience of the ice sheet to future warming and storms. It was at the lowest it has ever been in 2017, continuing a consistent downward trend (Kahn, 2017).

Given a reduction in the reflection of the Sun’s rays from the surface of white ice, an ice-free Arctic is predicted to increase warming globally by a substantial degree. Writing in 2014, scientists calculated this change is already equivalent to 25% of the direct forcing of temperature increase from CO2 during the past 30 years (Pistone et al, 2014). That means we could remove a quarter of the cumulative CO2 emissions of the last three decades and it would already be outweighed by the loss of the reflective power of Arctic sea ice. One of the most eminent climate scientists in the world, Peter Wadhams, believes an ice-free Arctic will occur one summer in the next few years and that it will likely increase by 50% the warming caused by the CO2 produced by human activity (Wadhams, 2016). In itself, that renders the calculations of the IPCC redundant, along with the targets and proposals of the UNFCCC.

Between 2002 and 2016, Greenland shed approximately 280 gigatons of ice per year, and the island’s lower-elevation and coastal areas experienced up to 13.1 feet (4 meters) of ice mass loss (expressed in equivalent-water- height) over a 14-year period (NASA, 2018). Along with other melting of land ice, and the thermal expansion of water, this has contributed to a global mean sea level rise of about 3.2 mm/year, representing a total increase of over 80 mm, since 1993 (JPL/PO.DAAC, 2018). Stating a figure per year implies a linear increase, which is what has been assumed by IPCC and others in making their predictions. However, recent data shows that the upward trend is non-linear (Malmquist, 2018). That means sea level is rising due to non-linear increases in the melting of land-based ice.

The observed phenomena, of actual temperatures and sea levels, are greater than what the climate models over the past decades were predicting for our current time. They are consistent with non-linear changes in our environment that then trigger uncontrollable impacts on human habitat and agriculture, with subsequent complex impacts on social, economic and political systems. I will return to the implications of these trends after listing some more of the impacts that are already being reported as occurring today.

Already we see impacts on storm, drought and flood frequency and strength due to increased volatility from more energy in the atmosphere (Herring et al, 2018). We are witnessing negative impacts on agriculture. Climate change has reduced growth in crop yields by 1–2 percent per decade over the past century (Wiebe et al, 2015). The UN Food and Agriculture Organisation (FAO) reports that weather abnormalities related to climate change are costing billions of dollars a year, and growing exponentially. For now, the impact is calculated in money, but the nutritional implications are key (FAO, 2018). We are also seeing impacts on marine ecosystems. About half of the world’s coral reefs have died in the last 30 years, due a mixture of reasons though higher water temperatures and acidification due to higher CO2 concentrations in ocean water being key (Phys.org, 2018). In ten years prior to 2016 the Atlantic Ocean soaked up 50 percent more carbon dioxide than it did the previous decade, measurably speeding up the acidification of the ocean (Woosley et al, 2016). This study is indicative of oceans worldwide, and the consequent acidification degrades the base of the marine food web, thereby reducing the ability of fish populations to reproduce themselves across the globe (Britten et al, 2015). Meanwhile, warming oceans are already reducing the population size of some fish species (Aaron-Morrison et al, 2017). Compounding these threats to human nutrition, in some regions we are witnessing an exponential rise in the spread of mosquito and tick-borne viruses as temperatures become more conducive to them (ECJCR, 2018).

# Looking Ahead

The impacts I just summarised are already upon us and even without increasing their severity they will nevertheless increase their impacts on our ecosystems, soils, seas and our societies over time. It is difficult to predict future impacts. But it is more difficult not to predict them. Because the reported impacts today are at the very worst end of predictions being made in the early 1990s - back when I first studied climate change and model- based climate predictions as an undergraduate at Cambridge University.

The models today suggest an increase in storm number and strength (Herring et al, 2018). They predict a decline of normal agriculture, including the compromising of mass production of grains in the northern hemisphere and intermittent disruption to rice production in the tropics. That includes predicted declines in the yields of rice, wheat, and corn in China by 36.25%, 18.26%, and 45.10%, respectively, by the end of this century (Zhang et al, 2016). Naresh Kumar et al. (2014) project a 6–23 and 15–25% reduction in the wheat yield in India during the 2050s and 2080s, respectively, under the mainstream projected climate change scenarios. The loss of coral and the acidification of the seas is predicted to reduce fisheries productivity by over half (Rogers et al, 2017). The rates of sea level rise suggest they may be soon become exponential (Malmquist, 2018), which will pose significant problems for billions of people living in coastal zones (Neumann et al, 2015). Environmental scientists are now describing our current era as the sixth mass extinction event in the history of planet Earth, with this one caused by us. About half of all plants and animal species in the world's most biodiverse places are at risk of extinction due to climate change (WWF, 2018). The World Bank reported in 2018 that countries needed to prepare for over 100 million internally displaced people due to the effects of climate change (Rigaud et al, 2018), in addition to millions of international refugees.

Despite you, me, and most people we know in this field, already hearing data on this global situation, it is useful to recap simply to invite a sober acceptance of our current predicament. It has led some commentators to describe our time as a new geological era shaped by humans - the Anthropocene (Hamilton, et al, 2015). It has led others to conclude that we should be exploring how to live in an unstable post-Sustainability situation (Benson and Craig, 2014; Foster, 2015). This context is worth being reminded of, as it provides the basis upon which to assess the significance, or otherwise, of all the praiseworthy efforts that have been underway and reported in some detail in this and other journals over the past decade. I will now offer an attempt at a summary of that broader context insofar as it might frame our future work on sustainability.

The politically permissible scientific consensus is that we need to stay beneath 2 degrees warming of global ambient temperatures, to avoid dangerous and uncontrollable levels of climate change, with impacts such as mass starvation, disease, flooding, storm destruction, forced migration and war. That figure was agreed by governments that were dealing with many domestic and international pressures from vested interests, particularly corporations. It is therefore not a figure that many scientists would advise, given that many ecosystems will be lost and many risks created if we approach 2 degrees global ambient warming (Wadhams, 2018). The IPCC agreed in 2013 that if the world does not keep further anthropogenic emissions below a total of 800 billion tonnes of carbon we are not likely to keep average temperatures below 2 degrees of global averaged warming. That left about 270 billion tonnes of carbon to burn (Pidcock, 2013). Total global emissions remain at around 11 billion tonnes of carbon per year (which is 37 billion tonnes of CO2). Those calculations appear worrying but give the impression we have at least a decade to change. It takes significant time to change economic systems so if we are not already on the path to dramatic reductions it is unlikely we will keep within the carbon limit. With an increase of carbon emissions of 2% in 2017, the decoupling of economic activity from emissions is not yet making a net dent in global emissions (Canadell et al, 2017). So, we are not on the path to prevent going over 2 degrees warming through emissions reductions. In any case the IPCC estimate of a carbon budget was controversial with many scientists who estimated that existing CO2 in the atmosphere should already produce global ambient temperature rises over 5°C and so there is no carbon budget – it has already been overspent (Wasdell, 2015).

That situation is why some experts have argued for more work on removing carbon from the atmosphere with machines. Unfortunately, the current technology needs to be scaled by a factor of 2 million within 2 years, all powered by renewables, alongside massive emission cuts, to reduce the amount of heating already locked into the system (Wadhams, 2018).

Biological approaches to carbon capture appear far more promising (Hawken and Wilkinson, 2017). These include planting trees, restoring soils used in agriculture, and growing seagrass and kelp, amongst other approaches. They also offer wider beneficial environmental and social side effects. Studies on seagrass (Greiner et al, 2013) and seaweed (Flannery, 2015) indicate we could be taking millions of tonnes of carbon from the atmosphere immediately and continually if we had a massive effort to restore seagrass meadows and to farm seaweed. The net sequestration effect is still being assessed but in certain environments will be significant (Howard et al, 2017). Research into “management-intensive rotational grazing” practices (MIRG), also known as holistic grazing, show how a healthy grassland can store carbon. A 2014 study measured annual per- hectare increases in soil carbon at 8 tons per year on farms converted to these practices (Machmuller et al, 2015). The world uses about 3.5 billion hectares of land for pasture and fodder crops. Using the 8 tons figure above, converting a tenth of that land to MIRG practices would sequester a quarter of present emissions. In addition, no-till methods of horticulture can sequester as much as two tons of carbon per hectare per year, so could also make significant contributions. It is clear, therefore, that our assessment of carbon budgets must focus as much on these agricultural systems as we do on emissions reductions.

Clearly a massive campaign and policy agenda to transform agriculture and restore ecosystems globally is needed right now. It will be a huge undertaking, undoing 60 years of developments in world agriculture. In addition, it means the conservation of our existing wetlands and forests must suddenly become successful, after decades of failure across lands outside of geographically limited nature reserves. Even if such will emerges immediately, the heating and instability already locked into the climate will cause damage to ecosystems, so it will be difficult for such approaches to curb the global atmospheric carbon level. The reality that we have progressed too far already to avert disruptions to ecosystems is highlighted by the finding that if CO2 removal from the atmosphere could work at scale, it would not prevent massive damage to marine life, which is locked in for many years due to acidification from the dissolving of CO2 in the oceans (Mathesius et al, 2015).

Despite the limitations of what humans can do to work with nature to encourage its carbon sequestration processes, the planet has been helping us out anyway. A global “greening” of the planet has significantly slowed the rise of carbon dioxide in the atmosphere since the start of the century. Plants have been growing faster and larger due to higher CO2 levels in the air and warming temperatures that reduce the CO2 emitted by plants via respiration. The effects led the proportion of annual carbon emissions remaining in the air to fall from about 50% to 40% in the last decade.

However, this process only offers a limited effect, as the absolute level of CO2 in the atmosphere is continuing to rise, breaking the milestone of 400 parts per million (ppm) in 2015. Given that changes in seasons, temperatures extremes, flood and drought are beginning to negatively affect ecosystems, the risk exists that this global greening effect may be reduced in time (Keenan et al, 2016)

These potential reductions in atmospheric carbon from natural and assisted biological processes is a flickering ray of hope in our dark situation. However, the uncertainty about their impact needs to be contrasted with the uncertain yet significant impact of increasing methane release in the atmosphere. It is a gas that enables far more trapping of heat from the sun’s rays than CO2 but was ignored in most of the climate models over the past decades. The authors of the 2016 Global Methane Budget report found that in the early years of this century, concentrations of methane rose by only about 0.5ppb each year, compared with 10ppb in 2014 and 2015. Various sources were identified, from fossil fuels - to agriculture to melting permafrost (Saunois et al, 2016).

Given the contentiousness of this topic in the scientific community, it may even be contentious for me to say that there is no scientific consensus on the sources of current methane emissions or the potential risk and timing of significant methane releases from either surface and subsea permafrost. A recent attempt at consensus on methane risk from melting surface permafrost concluded methane release would happen over centuries or millennia, not this decade (Schuur et al. 2015). Yet within three years that consensus was broken by one of the most detailed experiments which found that if the melting permafrost remains waterlogged, which is likely, then it produces significant amounts of methane within just a few years (Knoblauch et al, 2018). The debate is now likely to be about whether other microorganisms might thrive in that environment to eat up the methane – and whether or not in time to reduce the climate impact.

That report of subsea permafrost destabilisation in the East Siberian Arctic sea shelf, the latest unprecedented temperatures in the Arctic, and the data in non-linear rises in high-atmosphere methane levels, combine to make it feel like we are about to play Russian Roulette with the entire human race, with already two bullets loaded. Nothing is certain. But it is sobering that humanity has arrived at a situation of our own making where we now debate the strength of analyses of our near-term extinction.

# Apocalypse Uncertain

It is a truism that we do not know what the future will be. But we can see trends. We do not know if the power of human ingenuity will help sufficiently to change the environmental trajectory we are on.

Unfortunately, the recent years of innovation, investment and patenting indicate how human ingenuity has increasingly been channelled into consumerism and financial engineering. We might pray for time. But the evidence before us suggests that we are set for disruptive and uncontrollable levels of climate change, bringing starvation, destruction, migration, disease and war.

We do not know for certain how disruptive the impacts of climate change will be or where will be most affected, especially as economic and social systems will respond in complex ways. But the evidence is mounting that the impacts will be catastrophic to our livelihoods and the societies that we live within. Our norms of behaviour, that we call our “civilisation,” may also degrade. When we contemplate this possibility, it can seem abstract. The words I ended the previous paragraph with may seem, subconsciously at least, to be describing a situation to feel sorry about as we witness scenes on TV or online. But when I say starvation, destruction, migration, disease and war, I mean in your own life. With the power down, soon you wouldn’t have water coming out of your tap. You will depend on your neighbours for food and some warmth. You will become malnourished. You won’t know whether to stay or go. You will fear being violently killed before starving to death.

These descriptions may seem overly dramatic. Some readers might consider them an unacademic form of writing. Which would be an interesting comment on why we even write at all. I chose the words above as an attempt to cut through the sense that this topic is purely theoretical. As we are considering here a situation where the publishers of this journal would no longer exist, the electricity to read its outputs won’t exist, and a profession to educate won’t exist, I think it time we break some of the conventions of this format. However, some of us may take pride in upholding the norms of the current society, even amidst collapse. Even though some of us might believe in the importance of maintaining norms of behaviour, as indicators of shared values, others will consider that the probability of collapse means that effort at reforming our current system is no longer the pragmatic choice. My conclusion to this situation has been that we need to expand our work on “sustainability” to consider how communities, countries and humanity can adapt to the coming troubles. I have dubbed this the “Deep Adaptation Agenda,” to contrast it with the limited scope of current climate adaptation activities. My experience is that a lot of people are resistant to the conclusions I have just shared. So before explaining the implications, let us consider some of the emotional and psychological responses to the information I have just summarised.

# Systems of Denial

It would not be unusual to feel a bit affronted, disturbed, or saddened by the information and arguments I have just shared. In the past few years, many people have said to me that “it can’t be too late to stop climate change, because if it was, how would we find the energy to keep on striving for change?” With such views, a possible reality is denied because people want to continue their striving. What does that tell us? The “striving” is based in a rationale of maintaining self-identities related to espoused values. It is understandable why that happens. If one has always thought of oneself as having self-worth through promoting the public good, then information that initially appears to take away that self-image is difficult to assimilate.

That process of strategic denial to maintain striving and identity is easily seen in online debates about the latest climate science. One particular case is illustrative. In 2017 the New York Magazine published an article that drew together the latest data and analysis of what the implications of rapid climatic warming would be on ecosystems and humanity. Unlike the many dry academic articles on these subjects, this popular article sought to describe these processes in visceral ways (Wallace-Wells, 2017). The reaction of some environmentalists to this article did not focus on the accuracy of the descriptions or what might be done to reduce some of the worst effects that were identified in the article. Instead, they focused on whether such ideas should be communicated to the general public. Climate scientist Michael Mann warned against presenting “the problem as unsolvable, and feed[ing] a sense of doom, inevitability and hopelessness” (in Becker, 2017). Environmental journalist Alex Steffen (2017) tweeted that "Dropping the dire truth... on unsupported readers does not produce action, but fear." In a blog post, Daniel Aldana Cohen (2017) an assistant sociology professor working on climate politics, called the piece “climate disaster porn.” Their reactions reflect what some people have said to me in professional environmental circles. The argument made is that to discuss the likelihood and nature of social collapse due to climate change is irresponsible because it might trigger hopelessness amongst the general public. I always thought it odd to restrict our own exploration of reality and censor our own sensemaking due to our ideas about how our conclusions might come across to others. Given that this attempt at censoring was so widely shared in the environmental field in 2017, it deserves some closer attention.

I see four particular insights about what is happening when people argue we should not communicate to the public the likelihood and nature of the catastrophe we face. First, it is not untypical for people to respond to data in terms of what perspectives we wish for ourselves and others to have, rather than what the data may suggest is happening. That reflects an approach to reality and society that may be tolerable in times of plenty but counterproductive when facing major risks. Second, bad news and extreme scenarios impact on human psychology. We sometimes overlook that the question of how they impact is a matter for informed discussion that can draw upon psychology and communications theories. Indeed, there are journals dedicated to environmental psychology. There is some evidence from social psychology to suggest that by focusing on impacts now, it makes climate change more proximate, which increases support for mitigation (McDonald et al, 2015). That is not conclusive, and this field is one for further exploration. That serious scholars or activists would make a claim about impacts of communication without specific theory or evidence suggests that they are not actually motivated to know the effect on the public but are attracted to a certain argument that explains their view.

A third insight from the debates about whether to publish information on the probable collapse of our societies is that sometimes people can express a paternalistic relationship between themselves as environmental experts and other people whom they categorise as “the public”. That is related to the non-populist anti-politics technocratic attitude that has pervaded contemporary environmentalism. It is a perspective that frames the challenges as one of encouraging people to try harder to be nicer and better rather than coming together in solidarity to either undermine or overthrow a system that demands we participate in environmental degradation.

A fourth insight is that “hopelessness” and its related emotions of dismay and despair are understandably feared but wrongly assumed to be entirely negative and to be avoided whatever the situation. Alex Steffen warned that “Despair is never helpful” (2017). However, the range of ancient wisdom traditions see a significant place for hopelessness and despair.

Contemporary reflections on people’s emotional and even spiritual growth as a result of their hopelessness and despair align with these ancient ideas. The loss of a capability, a loved one or a way of life, or the receipt of a terminal diagnosis have all been reported, or personally experienced, as a trigger for a new way of perceiving self and world, with hopelessness and despair being a necessary step in the process (Matousek, 2008). In such contexts “hope” is not a good thing to maintain, as it depends on what one is hoping for. When the debate raged about the value of the New York Magazine article, some commentators picked up on this theme. “In abandoning hope that one way of life will continue, we open up a space for alternative hopes,” wrote Tommy Lynch (2017).

This question of valid and useful hope is something that we must explore much further. Leadership theorist Jonathan Gosling has raised the question of whether we need a more “radical hope” in the context of climate change and a growing sense of “things falling apart” (Gosling, 2016). He invites us to explore what we could learn from other cultures that have faced catastrophe. Examining the way Native American Indians coped with being moved on to reservations, Lear (2008) looked at what he calls the “blind spot” of any culture: the inability to conceive of its own destruction and possible extinction. He explored the role of forms of hope that involved neither denial or blind optimism. “What makes this hope radical, is that it is directed toward a future goodness that transcends the current ability to understand what it is” (ibid). He explains how some of the Native American chiefs had a form of “imaginative excellence” by trying to imagine what ethical values would be needed in their new lifestyle on the reservation. He suggests that besides the standard alternatives of freedom or death (in service of one’s culture) there is another way, less grand yet demanding just as much courage: the way of “creative adaptation.” This form of creatively constructed hope may be relevant to our Western civilisation as we confront disruptive climate change (Gosling and Case, 2013).

Such deliberations are few and far between in either the fields of environmental studies or management studies. It is to help break this semi- censorship of our own community of inquiry on sustainability that motivated me to write this article. Some scholarship has looked at the process of denial more closely. Drawing on sociologist Stanley Cohen, Foster (2015) identifies two subtle forms of denial – interpretative and implicative. If we accept certain facts but interpret them in a way that makes them “safer” to our personal psychology, it is a form of “interpretative denial”. If we recognise the troubling implications of these facts but respond by busying ourselves on activities that do not arise from a full assessment of the situation, then that is “implicative denial”. Foster argues that implicative denial is rife within the environmental movement, from dipping into a local Transition Towns initiative, signing online petitions, or renouncing flying, there are endless ways for people to be “doing something” without seriously confronting the reality of climate change.

There are three main factors that could be encouraging professional environmentalists in their denial that our societies will collapse in the near- term. The first is the way the natural scientific community operates.

Eminent climate scientist James Hansen has always been ahead of the conservative consensus in his analyses and predictions. Using the case study of sea level rise, he threw light on processes that lead to “scientific reticence” to conclude and communicate scenarios that would be disturbing to employers, funders, governments and the public (Hansen, 2007). A more detailed study of this process across issues and institutions found that climate-change scientists routinely underestimate impacts “by erring on the side of least drama” - (Brysse et al, 2013). Combined with the norms of scientific analysis and reporting to be cautious and avoid bombast, and the time it takes to fund, research, produce and publish peer-reviewed scientific studies, this means that the information available to environmental professionals about the state of the climate is not as frightening as it could be. In this paper I have had to mix information from peer-reviewed articles with recent data from individual scientists and their research institutions to provide the evidence which suggests we are now in a non-linear situation of climactic changes and effects.

A second set of factors influencing denial may be personal. George Marshall summarised the insights from psychology on climate denial, including the interpretive and implicative denial of those of who are aware but have not prioritised it. In particular, we are social beings and our assessment of what to do about information is influenced by our culture. Therefore, people often avoid voicing certain thoughts when they go against the social norm around them and/or their social identity. Especially in situations of shared powerlessness, it can be perceived as safer to hide one's views and do nothing if it goes against the status quo. Marshall also explains how our typical fear of death means that we do not give our full attention to information that reminds us of that. According to anthropologist Ernest Becker (1973): “A fear of death lies at the centre of all human belief.” Marshall explains: “The denial of death is a ‘vital lie’ that leads us to invest our efforts into our cultures and social groups to obtain a sense of permanence and survival beyond our death. Thus, [Becker] argued, when we receive reminders of our death – what he calls death salience – we respond by defending those values and cultures.” This view was recently expounded as part of the “terror management theory” proposed by Jeff Greenberg, Sheldon Solomon, and Tom Pyszczynski (2015). Although Marshall does not consider it directly, these processes would apply more so to “collapse denial” than to climate denial, as the death involves not only oneself but all of what one could contribute to.

These personal processes are likely made worse for sustainability experts than the general public, given the typical allegiance of professionals to incumbent social structures. Research has revealed that people who have a higher level of formal education are more supportive of the existing social and economic systems that those that have less education (Schmidt, 2000). The argument is that people who have invested time and money in progressing to a higher status within existing social structures are more naturally inclined to imagine reform of those systems than their upending.

This situation is accentuated if we assume our livelihood, identity and self- worth is dependent on the perspective that progress on sustainability is possible and that we are part of that progressive process.

The third factor influencing denial is institutional. I have worked for over 20 years within or with organisations working on the sustainability agenda, in non-profit, private and governmental sectors. In none of these sectors is there an obvious institutional self-interest in articulating the probability or inevitability of social collapse. Not to members of your charity, not to consumers of your product, not to voters for your party. There are a few niche companies that benefit from a collapse discourse leading some people to seek to prepare by buying their products. This field may expand in future, at various scales of preparedness, which I return to below. But the internal culture of environmental groups remains strongly in favour of appearing effective, even when decades of investment and campaigning have not produced a net positive outcome on climate, ecosystems or many specific species.

Let us look at the largest environmental charity, WWF, as an example of this process of organisational drivers of implicative denial. I worked for them when we were striving towards all UK wood product imports being from sustainable forests by 1995. Then it became “well-managed” forests by 2000. Then targets were quietly forgotten while the potensiphonic language[5](#_bookmark4) of solving deforestation through innovative partnerships remained. If the employees of the world’s leading environmental groups were on performance related pay, they would probably owe their members and donors money by now. The fact that some readers may find such a comment to be rude and unhelpful highlights how our interests in civility, praise and belonging within a professional community can censor those of us who seek to communicate uncomfortable truths in memorable ways (like that journalist in the New York Magazine).

These personal and institutional factors mean that environmental professionals may be some of the slowest to process the implications of the latest climate information. In 2017, a survey of more than 8,000 people across 8 different countries – Australia, Brazil, China, Germany, India, South Africa, the UK, and the US – asked respondents to gauge their perceived level of security as compared to two years ago in regards to global risks. A total of 61% said they felt more insecure, while only 18% said they felt more secure. On climate change, 48% of respondents strongly agreed that it is a global catastrophic risk, with an additional 36% of people tending to agree with that. Only 14% of respondents disagreed to some degree with the idea that climate change presented a catastrophic risk (Hill, 2017). This perspective on climate may help explain other survey data that suggests remarkable changes in how people view technology, progress, their society, and the future prospects for their children. A 2017 global survey found that only 13% of the public think the world is getting better, which is major change from the ten years before (Ipsos MORI, 2017). In the USA, polls indicate that belief in technology as a good force has been fading (Asay, 2013). This information may reflect a wider questioning of the idea that progress is always good and possible. Such as shift in perspective is indicated by opinion polls showing that far fewer people today than the last decade believe their children will have a better future than themselves (Stokes, 2017). Another indicator of whether people believe in their future is if they believe in the basis of their society. Studies have consistently found that more people are losing faith in electoral democracy and in the economic system (Bendell and Lopatin, 2017). The questioning of mainstream life and of progress is also reflected in the shift away from secular-rational values to traditional values that has been occurring worldwide since 2010 (World Values Survey, 2016). How do children feel about their futures? I have not found a large or longitudinal study on children’s views of the future, but one journalist who asked children from 6 to 12 years old to paint what they expect the world in 50 years to be like generated mostly apocalyptic images (Banos Ruiz, 2017). This evidence suggests that the idea we “experts” need to be careful about what to tell “them” the “unsupported public” may be a narcissistic delusion in need of immediate remedy.

Emotional difficulties with realising the tragedy that is coming, and that is in many ways upon us already, are understandable. Yet these difficulties need to be overcome so we can explore what the implications may be for our work, lives and communities.

# Framing After Denial

As a sense of calamity grows within the environmental movement, some argue against a focus on "carbon reductionism" for how it may limit our appreciation of why we face this tragedy and what to do about it (Eisenstein, 2018). I agree that climate change is not just a pollution problem, but an indicator of how our human psyche and culture became divorced from our natural habitat. However, that does not mean we should deprioritise the climate situation for a broader environmental agenda.

If we allow ourselves to accept that a climate-induced form of economic and social collapse is now likely, then we can begin to explore the nature and likelihood of that collapse. That is when we discover a range of different views. Some frame the future as involving a collapse of this economic and social system, which does not necessarily mean a complete collapse of law, order, identity and values. Some regard that kind of collapse as offering a potential upside in bringing humanity to a post-consumerist way of life that would be more conscious of relationships between people and nature (Eisenstein, 2013). Some even argue that this reconnection with nature will generate hitherto unimaginable solutions to our predicament. Sometimes that view comes with a belief in the power of spiritual practices to influence the material world according to human intent. The perspective that natural or spiritual reconnection might save us from catastrophe is, however, a psychological response one could analyse as a form of denial.

Some analysts emphasise the unpredictable and catastrophic nature of this collapse, so that it will not be possible to plan a way to transition at either collective or small-scale levels to a new way of life that we might imagine as tolerable, let alone beautiful. Then others go further still and argue that the data can be interpreted as indicating climate change is now in a runaway pattern, with inevitable methane release from the seafloor leading to a rapid collapse of societies that will trigger multiple meltdowns of some of the world’s 400 nuclear power-stations, leading to the extinction of the human race (McPherson, 2016). This assessment that we face near-term human extinction can draw on the conclusions by geologists that the last mass extinction of life on earth, where 95% of species disappeared, was due to methane-induced rapid warming of the atmosphere (Lee, 2014; Brand et al, 2016).

With each of these framings – collapse, catastrophe, extinction – people describe different degrees of certainty. Different people speak of a scenario being possible, probable or inevitable. In my conversations with both professionals in sustainability or climate, and others not directly involved, I have found that people choose a scenario and a probability depending not on what the data and its analysis might suggest, but what they are choosing to live with as a story about this topic. That parallels findings in psychology that none of us are purely logic machines but relate information into stories about how things relate and why (Marshall, 2014). None of us are immune to that process. Currently, I have chosen to interpret the information as indicating inevitable collapse, probable catastrophe and possible extinction. There is a growing community of people who conclude we face inevitable human extinction and treat that view as a prerequisite for meaningful discussions about the implications for our lives right now. For instance, there are thousands of people on Facebook groups who believe human extinction is near. In such groups I have witnessed how people who doubt extinction is either inevitable or coming soon are disparaged by some participants for being weak and deluded. This could reflect how some of us may find it easier to believe in a certain than an uncertain story, especially when the uncertain future would be so different to today that it is difficult to comprehend. Reflection on the end of times, or eschatology, is a major dimension of the human experience, and the total sense of loss of everything one could ever contribute to is an extremely powerful experience for many people. How they emerge from that experience depends on many factors, with loving kindness, creativity, transcendence, anger, depression, nihilism and apathy all being potential responses. Given the potential spiritual experience triggered by sensing the imminent extinction of the human race, we can appreciate why a belief in the inevitability of extinction could be a basis for some people to come together.

In my work with mature students, I have found that inviting them to consider collapse as inevitable, catastrophe as probable and extinction as possible, has not led to apathy or depression. Instead, in a supportive environment, where we have enjoyed community with each other, celebrating ancestors and enjoying nature before then looking at this information and possible framings for it, something positive happens. I have witnessed a shedding of concern for conforming to the status quo, and a new creativity about what to focus on going forward. Despite that, a certain discombobulation occurs and remains over time as one tries to find a way forward in a society where such perspectives are uncommon. Continued sharing about the implications as we transition our work and lives is valuable.

One further factor in the framing of our situation concerns timing. Which also concerns geography. Where and when will the collapse or catastrophe begin? When will it affect my livelihood and society? Has it already begun? Although it is difficult to forecast and impossible to predict with certainty, that does not mean we should not try. The current data on temperature rise at the poles and impacts on weather patterns around the world suggests we are already in the midst of dramatic changes that will impact massively and negatively on agriculture within the next twenty years. Impacts have already begun. That sense of near-term disruption to our ability to feed ourselves and our families, and the implications for crime and conflict, adds another level to the discombobulation I mentioned. Should you drop everything now and move somewhere more suitable for self-sufficiency?

Should you be spending time reading the rest of this article? Should I even finish writing it? Some of the people who believe that we face inevitable extinction believe that no one will read this article because we will see a collapse of civilisation in the next twelve months when the harvests fail across the northern hemisphere. They see social collapse leading to immediate meltdowns of nuclear power stations and thus human extinction being a near-term phenomenon. Certainly not more than five years from now. The clarity and drama of their message is why Inevitable Near Term Human Extinction (INTHE) has become a widely used phrase online for discussions about climate-collapse.

Writing about that perspective makes me sad. Even four years after I first let myself consider near-term extinction properly, not as something to dismiss, it still makes my jaw drop, eyes moisten, and air escape my lungs. I have seen how the idea of INTHE can lead me to focus on truth, love and joy in the now, which is wonderful, but how it can also make me lose interest in planning for the future. And yet I always come around to the same conclusion – we do not know. Ignoring the future because it is unlikely to matter might backfire. “Running for the hills” – to create our own eco- community – might backfire. But we definitely know that continuing to work in the ways we have done until now is not just backfiring – it is holding the gun to our own heads. With this in mind, we can choose to explore how to evolve what we do, without any simple answers. In my post-denial state, shared by increasing numbers of my students and colleagues, I realised that we would benefit from conceptual maps for how to address these questions. I therefore set about synthesising the main things people talked about doing differently in light of a view of inevitable collapse and probable catastrophe. That is what I offer now as the “deep adaptation agenda.”

# The Deep Adaptation Agenda

For many years, discussions and initiatives on adaptation to climate change were seen by environmental activists and policymakers as unhelpful to the necessary focus on carbon emissions reductions. That view finally changed in 2010 when the IPCC gave more attention to how societies and economies could be helped to adapt to climate change.

Since then the funding being made available to climate adaptation has grown, with all the international development institutions active on adaptation finance. Typical projects include improving the ability of small-scale farmers to cope with weather variability through the introduction of irrigation and the ability of urban planners to respond to rising sea levels and extreme rainfall events through reengineering drainage systems (Climate Action Programme, 2018). These initiatives are falling short of the commitments made by governments over the past 8 years, and so more is being done to promote private bonds to finance adaptation (Bernhardt, 2018) as well as stimulate private philanthropy on this agenda (Williams, 2018).

These efforts are paralleled by an increased range of activities under the umbrella of “Disaster Risk Reduction” which has its own international agency – the United Nations International Strategy for Disaster Reduction (UNISDR). The aim of their work is to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through reducing sensitivity to these hazards as well as increasing the capacity to respond when disasters hit. That focus means significant engagement with urban planners and local governments. In the business sector, this disaster risk reduction agenda meets the private sector through the well-established fields of risk management and business continuity management. Companies ask themselves what the points of failure might be in their value chains and seek to reduce those vulnerabilities or the significance of something failing.

Given the climate science we discussed earlier, some people may think this action is too little too late. Yet, if such action reduces some harm temporarily, that will help people, just like you and me, and therefore such action should not be disregarded. Nevertheless, we can look more critically at how people and organisations are framing the situation and the limitations that such a framing may impose. The initiatives are typically described as promoting “resilience”, rather than sustainability. Some definitions of resilience within the environmental sector are surprisingly upbeat. For instance, the Stockholm Resilience Centre (2015) explains that “resilience is the capacity of a system, be it an individual, a forest, a city or an economy, to deal with change and continue to develop. It is about how humans and nature can use shocks and disturbances like a financial crisis or climate change to spur renewal and innovative thinking.” In offering that definition, they are drawing on concepts in biology, where ecosystems are observed to overcome disturbances and increase their complexity (Brand and Jax, 2007).

Two issues require attention at this point. First, the upbeat allegiance to “development” and “progress” in certain discourses about resilience may not be helpful as we enter a period when material “progress” may not be possible and so aiming for it might become counter-productive. Second, apart from some limited soft skills development, the initiatives under the resilience banner are nearly all focused on physical adaptation to climate change, rather than considering a wider perspective on psychological resilience. In psychology, “resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats or significant sources of stress — such as family and relationship problems, serious health problems or workplace and financial stressors. It means ‘bouncing back’ from difficult experiences” (American Psychology Association, 2018). How a person “bounces back” after difficulties or loss, may be through a creative reinterpretation of identity and priorities. The concept of resilience in psychology does not, therefore, assume that people return to how they were before. Given the climate reality we now face, this less progressivist framing of resilience is more useful for a deeper adaptation agenda.

In pursuit of a conceptual map of “deep adaptation,” we can conceive of resilience of human societies as the capacity to adapt to changing circumstances so as to survive with valued norms and behaviours. Given that analysts are concluding that a social collapse is inevitable, the question becomes: What are the valued norms and behaviours that human societies will wish to maintain as they seek to survive? That highlights how deep adaptation will involve more than “resilience.” It brings us to a second area of this agenda, which I have named “relinquishment.” It involves people and communities letting go of certain assets, behaviours and beliefs where retaining them could make matters worse. Examples include withdrawing from coastlines, shutting down vulnerable industrial facilities, or giving up expectations for certain types of consumption. The third area can be called “restoration.” It involves people and communities rediscovering attitudes and approaches to life and organisation that our hydrocarbon-fuelled civilisation eroded. Examples include re-wilding landscapes, so they provide more ecological benefits and require less management, changing diets back to match the seasons, rediscovering non-electronically powered forms of play, and increased community-level productivity and support.

It is not my intention in this paper to map out more specific implications of a deep adaptation agenda. Indeed, it is impossible to do so, and to attempt it would assume we are in a situation for calculated attempts at management, when what we face is a complex predicament beyond our control. Rather, I hope the deep adaptation agenda of resilience, relinquishment and restoration can be a useful framework for community dialogue in the face of climate change. Resilience asks us “how do we keep what we really want to keep?” Relinquishment asks us “what do we need to let go of in order to not make matters worse?” Restoration asks us “what can we bring back to help us with the coming difficulties and tragedies?” In 2017, this deep adaptation agenda was used to frame a festival of alternatives organised by Peterborough Environment City Trust. It included a whole day devoted to exploring what relinquishment could involve. As such, it allowed more open conversation and imagination than a narrower focus on resilience. Further events are planned across the UK. Whether it will be useful framing for a broader-level policy agenda is yet to be seen.

How does this "deep adaptation agenda" relate to the broad conceptual framework of sustainable development? It is related to other perspectives that despite the attention of international institutions to “sustainable development goals,” the era of “sustainable development” as unifying concept and goal is now ending. It is an explicitly post-sustainability framing, and part of the Restoration Approach to engaging with social and environmental dilemmas, as I outlined elsewhere (Bendell, et al 2017).

# Conclusions

Since records began in 1850, seventeen of the eighteen hottest years have occurred since 2000. Important steps on climate mitigation and adaptation have been taken over the past decade. However, these steps could now be regarded as equivalent to walking up a landslide. If the landslide had not already begun, then quicker and bigger steps would get us to the top of where we want to be. Sadly, the latest climate data, emissions data and data on the spread of carbon-intensive lifestyles show that the landslide has already begun. As the point of no return can’t be fully known until after the event, ambitious work on reducing carbon emissions and extracting more from the air (naturally and synthetically) is more critical than ever. That must involve a new front of action on methane.

Disruptive impacts from climate change are now inevitable. Geoengineering is likely to be ineffective or counter-productive. Therefore, the mainstream climate policy community now recognises the need to work much more on adaptation to the effects of climate change. That must now rapidly permeate the broader field of people engaged in sustainable development as practitioners, researchers and educators. In assessing how our approaches could evolve, we need to appreciate what kind of adaptation is possible. Recent research suggests that human societies will experience disruptions to their basic functioning within less than ten years due to climate stress. Such disruptions include increased levels of malnutrition, starvation, disease, civil conflict and war – and will not avoid affluent nations. This situation makes redundant the reformist approach to sustainable development and related fields of corporate sustainability that has underpinned the approach of many professionals (Bendell et al, 2017). Instead, a new approach which explores how to reduce harm and not make matters worse is important to develop. In support of that challenging, and ultimately personal process, understanding a deep adaptation agenda may be useful.

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| **Bendell’s ‘Four R’s’***The deep adaptation agenda proposes the following concepts as a framework for community dialogue in the face of climate change:***Resilience – “How do we keep what we really want to keep?”**A number explanations or definitions are given from both a physical and psychological perspective. In pursuit of a conceptual map of “deep adaptation,” the resilience of human societies can be conceived as the capacity to adapt to changing circumstances so as to survive with valued norms and behaviors. The question is asked “What are the valued norms and behaviors that human societies will wish to maintain as they seek to survive?”**Relinquishment – “What do we need to let go of in order to not make matters worse?”**The concept involves people and communities letting go of certain assets, behaviors, and beliefs where retaining them could make matters worse (e.g. withdrawing from coastlines, shutting down vulnerable industrial facilities, or giving up expectations for certain types of consumption).**Restoration – “What do we bring back to help us with the coming difficulties and tragedies?”**It involves people and communities rediscovering attitudes and approaches to life and organisation that our fossil fuel-based civilization has eroded. (e.g. re-wilding landscapes so they provide more ecological benefits and require less management, changing diets back to match the seasons, rediscovering non-electronically powered forms of play, and increased community-level productivity and support).**Reconciliation – “Consider different forms of hope.”** (this fourth ‘R’ was added after the original paper was published)Reconciliation speaks to moving through a process to arrive at a state of hope and vision despite imminent societal collapse. To do this one is asked to consider different forms of hope. In that consideration, the idea of radical hope is arrived at, which is summarized to mean “a form of hope that’s consciously chosen after denial. It is a form of hope that is ’empowered surrender’ to a situation. It accepts difficult realities about what is happening as well as one’s capabilities to influence things, but still connects with deeper values and requires action to make it real.”The process then turns to the question of beliefs. At the end of the discussion on belief one is invited to do as follows: “…Once you have explored what you really believe in, then stared back into the abyss of an imminent societal collapse, you may find, a radical hope of your own.” Once again the reader is asked to read the discussion regarding beliefs first hand for themselves here.The next step is to ask the question: “What could I make peace with to lessen suffering? This question incorporates the idea of Reconciliation with one’s death, including any difficulties and regrets in one’s life, any anger towards existence itself (or God). It also invites reconciliation between peoples, genders, classes, generations, countries, religions and political persuasions. Because it is time to make our peace. Otherwise, without this inner deep adaptation to climate collapse we risk tearing each other apart and dying hellishly. My radical hope is that more of us work together to achieve this reconciliation, in all its forms, as a basis for the fuller deep adaptation agenda that I explain in my paper.” |

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| **What are some of the implications of the ‘Deep Adaptation Agenda framework?’**The paper itself intentionally avoids the discussion of more detailed implications stating that its purpose is to provide a “useful framework for community dialogue in the face of climate change.” Despite this statement, there are hints and ideas about what some of those practical implications might be such as:* People need support to access information and networks for how to attempt a shift in their livelihoods and lifestyles.
* Free online and in-person courses as well as support networks on self-sufficiency need to be scaled. Local governments will need similar support on how to develop the capabilities today that will help their local communities to collaborate, not fracture, during a collapse. For instance, they will need to roll out systems for productive cooperation between neighbors, such as product and service exchange platforms enabled by locally issued currency.
* At an international level there is need to work on how to responsibly address the wider fallout from collapsing societies (Harrington, 2016). These will be many, but obviously include the challenges of refugee support and the securing of dangerous industrial and nuclear sites at the moment of societal collapse.
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| **Interesting Observations on Mainstream Responses to Environmental Issues**The paper makes some interesting observations about the West’s current mainstream responses to environmental issues in the context of the dominance of neoliberal economics starting in the 1970’s as follows (A humorous cautionary note that you may recognize your own behaviors in some of these):* Hyper-individualist - The focus on individual action as consumers, switching light bulbs or buying sustainable furniture, rather than promoting political action as engaged citizens.
* Market fundamentalist - A focus on market mechanisms like the complex, costly and largely useless carbon cap and trade systems, rather than exploring what more government intervention could achieve.
* Incremental Approach - A focus on celebrating small steps forward such as a company publishing a sustainability report, rather than strategies designed for speed and scale of change suggested by the science.
* Atomistic Approach - A focus on seeing climate action as a separate issue from the governance of markets, finance and banking, rather than exploring what kind of economic system could permit or enable sustainability.
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The Deep Adaptation Agenda captures the dire nature of the Climate Change Emergency and provides a framework for dialogue on how individuals and communities can adapt psychologically and physically. It offers hope with the idea that a post-collapse society could be planned in such a way as to survive with valued norms and behaviors. It fosters the idea of ‘radical hope’ which empowers one to take action in our current ‘pre-collapse societal state’ on matters such as mitigation and adaptation despite one’s understanding that a societal collapse is likely.