Climate Change & Youth Mental Health

Psychological Impacts, Resilience Resources & Future Directions

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About:

See Change is a research institute devoted to studying and shaping behavior change programs for the greater good. We specialize in research, strategy, design, evaluation of behavioral programs focused on the intersection of human and environmental health.

Blue Shield of California, a member of the Blue Shield Association, is a nonprofit health plan dedicated to providing Californians with access to high-quality health care at an affordable price.

The Climate Mental Health Network addresses the mental health consequences of climate change through community engagement and by harnessing the power of media and technology.

The Global Fund for Mental Health supports programs to increase mental health services in under-resourced communities, reduce the stigma of mental illness, and enhance mental health awareness.

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Executive Summary

Climate change is causing a maelstrom of disasters and negative environmental changes across the globe. In the United States, the percentage of Americans who have been directly affected by climate change-related disasters — such as wildfires, heatwaves, floods, and hurricanes — has increased drastically in just the past few years. Disaster survivors often suffer significant losses, including the loss of loved ones, pets, their home, their hometown, and/or their livelihood. Undergoing the intense and stressful conditions of a major disaster and suffering resulting losses can be a traumatic experience for many individuals, with significant and sometimes long-lasting impacts on mental health. Climate change can also have indirect effects on mental health. Simply bearing witness to the negative impacts of climate change, or learning about how climate change is causing suffering to people and ecosystems around the globe, can lead to significant psychological suffering, including anxiety, grief, fear, anger, and guilt. Negative emotions about climate change are often referred to as "climate anxiety", "eco-anxiety", or "climate grief", and can range from mild to severe.

Young people seem to be particularly vulnerable to the psychological impacts of climate change. Surveys examining concerns about climate change stratified by age have found that although distress about climate change is high among the general population, the prevalence is highest among young adults. For example, a 2020 American Psychiatric Association poll of U.S. adults found that 67% of Gen Zers (18-23 years) were "somewhat" or "very" concerned about the impact of climate change on their mental health, a figure higher than that found among older generations.[1] A recent, large-scale global survey conducted with 10,000 youth ages 16-24 from ten countries — including the U.S. — found that 59% of adolescents and young adults reported feeling "very" or "extremely" worried about climate change, and over 45% reported that this worry interferes with their daily functioning. Distress about climate change was significantly correlated with perceptions that governments were failing to respond adequately to the crisis, and related feelings of betrayal.[2] Youth also commonly report that their concerns are dismissed or belittled when they try to discuss them with adults.[3] Concerns about climate change have begun to shape major life decisions among young people, including where they live, what careers they pursue, and whether or not they plan to have children.[4]

Beyond age, a host of other factors can render individuals particularly vulnerable to climate change-related mental health impacts. The degree of exposure to climate disasters and

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[1] American Psychiatric Association. (2020, October 21). *APA Public Opinion Poll - Annual Meeting 2020*. American Psychiatric Association.
[2] Marks, E., Hickman, C., Pihkala, P., Clayton, S., Lewandowski, E. R., Mayall, E. E., Wray, B., Mellor, C., & van Susteren, L. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon. *Lancet Planetary Health*, *5*(12).
[3] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety. *Journal of Social Work Practice*, *34*(4), 411-424.
[4] Haaland, M. (2021, September 6). *Majority of young American adults say climate change influences their decision to have children*. SWNS Digital.

negative environmental changes matters; individuals most severely impacted by climate change are also at greatest risk for resulting mental health sequelae.[5] Often those who are most severely impacted by climate change and pollution are communities of color and low-income communities; compounding the problem is the fact that these communities also tend to have fewer available resources to buffer their impacts. The stress imposed by climate change also exacerbates pre-existing stressors in these communities, including poverty, systemic racism, racial violence, unstable housing, and interrupted education access.[6] Existing research also suggests that the risk of psychological suffering related to climate change may be elevated among girls and women, individuals with prior trauma, and those with pre-existing conditions or disabilities.[7]

What can be done to support individuals struggling with climate anxiety and grief? For most people, distress about climate change is not a pathological condition, but rather an appropriate response to an all-too-real existential threat.[8] Worrying about climate change can be constructive and motivate individuals to take much-needed actions to help mitigate climate change, such as making lifestyle changes or engaging in activism.[9] Thus, the goal of interventions for climate anxiety should not be to eliminate negative emotions, but rather to facilitate healthy processing of emotions, reduce stress and functional impairment, and foster resilience. Additionally, a subset of individuals, often those severely impacted and/or with pre-existing trauma, can suffer more pronounced and disruptive mental health issues, which may call for more substantial intervention from a mental health professional.

As awareness about the mental health impacts of climate change grows, resources and interventions designed for individuals suffering from climate anxiety are quickly proliferating. Almost none of the existing resources have been evaluated for efficacy for climate anxiety specifically, however, the most promising are those that are based on empirically-supported strategies for coping with related issues, such as trauma, generalized anxiety disorder, and depression. Based on a review of the literature and discussions with experts in this area, we suggest that there are at least seven core strategies that are rooted in empirical research and represent promising approaches for addressing climate anxiety and grief. These core components are (1) acknowledging and validating feelings, (2) emotional coping tools (including

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[5] Abramson, D. M., Van Alst, D., Merdjanoff, A., Piltch-Loeb, R., Beedasy, J., Findley, P., Peek, L. A., Mordy, M., Moroso, S., Ocasio, K., Park, Y. S., Sury, J., & Tobin-Gurley, J. (2015). *The Hurricane Sandy person report: Disaster exposure, health impacts, economic burden, and social well-being*. Rutgers University School of Social Work, New York University College of Global Public Health, Columbia University National Center for Disaster Preparedness, and Colorado State University Center for Disaster and Risk Analysis.

[6] Ragavan, M. I., Marcil, L. E., & Garg, A. (2020). Climate change as a social determinant of health. *Pediatrics*, *145*(5).

[7] Clayton, S., Manning, C. M., Speiser, M., & Hill, A. N. (2021). Mental health and our changing climate: Impacts, inequities, responses. American Psychological Association, Climate for Health, and ecoAmerica.

[8] Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, *74*, 1-7.

[9] Brosch, T. (2021). Affect and emotions as drivers of climate change perception and action: A review. *Current Opinion in Behavioral Sciences*, *42*, 15-21.

reframing; cultivating meaning, hope, and optimism; and mindfulness), (3) social connection, (4) connecting with nature, (5) climate action, (6) self-care, and (7) climate justice awareness. Each of these components is discussed in turn, including a brief discussion of the research supporting them, with special consideration given to their potential effectiveness and/or limitations for BIPOC and historically marginalized groups, when relevant.

The resources and interventions highlighted in this report are those that maximally incorporate these empirically-supported strategies and are either tailored to, or appropriate for, youth and people of color, and available to California residents. We include resources for use in clinical as well as non-clinical settings. Clinical resources include information sources for patients to connect with climate-aware mental health professionals, as well as emerging training sources for practitioners. We also discuss available community resources (including groups that use emotional methodologies, climate conversation groups, outdoor groups, and activist groups), education resources (including resources available for use in classroom settings and extracurricular groups), and mass media resources (including literature, social media, podcasts, and film).

In the final section, we make recommendations for future directions in climate anxiety research and resource development. We first focus on gaps in current knowledge. Impressive survey work has now been done showing that adolescents and young adults are highly concerned about climate change and that these concerns impact their mental health and functioning. However, few studies have examined racial/ethnic differences in the experience of climate emotions, even though communities of color are poised to suffer (and are already suffering) the greatest burden of climate change. Additionally, work is needed to identify best practices for communicating the stark reality of climate change to young people, in particular children and adolescents, in age-appropriate ways that avoid overly intense responses and potential developmental disruptions.

We also focus on opportunities for developing impactful interventions that meet the needs of individuals experiencing different levels of distress, and which can be applied not only in clinical settings but also more broadly in the community, in the classroom, and at home. We suggest opportunities for school-based curriculums, family-based programs, and community climate circles. Additionally, we identify a strong need for clinical training to help clinicians effectively identify and support individuals struggling with climate change-related mental health issues. Finally, we discuss the potential usefulness of a centralized, accredited “resource hub”, a comprehensive library of resources — vetted by mental health professionals — for supporting climate anxiety across a variety of settings.

Introduction

In the words of a recent report on climate change issued by an international team of scientists, humanity is facing "a ghastly future of mass extinction, declining health and climate-disruption upheavals (including looming massive migrations) and resource conflicts this century."[10] The report goes on to state that "future environmental conditions will be far more dangerous than currently believed. The scale of the threats to the biosphere and all its life forms—including humanity—is in fact so great that it is difficult to grasp for even well-informed experts."[11]

After reading the above words, the reader may experience a psychological phenomenon that has become more widespread in recent years, as the general public grows increasingly aware of the stark realities of climate change. Called "climate anxiety", "eco-anxiety", or "climate grief", these terms refer to the thoughts, emotions, and accompanying physical sensations (e.g., tightening of the throat, rapid heart rate) that can be triggered by an awareness of the losses sustained and the future threats engendered by human-caused climate change.[12]

Climate change is already wreaking havoc across the globe. In the United States, communities across the country have endured a multitude of climate disasters, from flash flooding in New York and a heat dome in the Pacific Northwest, to hail storms in Texas and wildfires and droughts in California. The number of Americans impacted by such events is rapidly expanding. In 2021, over 32% of Americans lived in a county or state declared a disaster area by the Federal Emergency Management Agency (FEMA); a dramatic increase from 2018, when it was only 5%.[13] In the summer of 2021 alone, nearly one-third of Americans lived in a county impacted by a weather disaster, and 64% lived in an area afflicted by a multi-day heatwave. Within just those three months, at least 388 Americans died due to hurricanes, floods, heatwaves, and wildfires, and many more suffered profound losses, including loved ones, pets, their home, and/or their livelihood.[14]

Although climate change has been declared a health emergency by governments, academics, advocacy groups, and medical associations,[15] attention has largely focused on the negative impacts of climate change on mortality and physical health. However, as leading psychological associations have begun to recognize, climate change also has profound implications for mental health. The American Psychological Association (APA) and the American Psychiatric

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[10] Bradshaw, C. J. A., Ehrlich, P. R., Beattie, A., Ceballos, G., Crist, E., Diamond, J., Dirzo, R., Ehrlich, A. H., Harte, J., Harte, M. E., Pyke, G., Raven, P. H., Ripple, W. J., Saltré, F., Turnbull, C., Wackernagel, M., & Blumstein, D. T. (2021). Underestimating the challenges of avoiding a ghastly future. *Frontiers in Conservation Science*, *1*, 1-10.
[11] Ibid.
[12] Lawrance, D. E., Thompson, R., Fontana, G., & Jennings, D. N. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice. Imperial College London, Institute of Global Health Innovation, and Grantham Institute.
[13] Kaplan, S., & Tran, A. B. (2021, September 4). Nearly 1 in 3 Americans experienced a weather disaster this summer. *The Washington Post.*
[14] Ibid.
[15] American Lung Association. (2021, January 26). *A declaration on climate change and health*.

Association have formally acknowledged the mental health impacts of climate disruption and deemed it a threat to public health.[16,17,18] In 2019, leaders of more than 40 psychological associations from around the world, including the APA, signed a resolution recognizing the adverse impacts of climate change on mental health, and resolving to help raise awareness and support intervention efforts.[19] Public awareness of the mental health impacts of climate change has begun to grow more recently. For example, as of October 2021, Google searches for the term "climate anxiety" have experienced a dramatic uptick of 565% over the past 12 months.[20]

As mental health practitioners, public health officials, and now the general public are becoming increasingly aware, living through a disaster such as a hurricane, fire, or flood — especially if this is accompanied by the death of a loved one or losing one's home — can cause severe psychological distress and trauma. Bearing witness to the negative effects of climate change on communities and ecosystems, and having an awareness that climate change disasters are projected to continue and even worsen in the future, can elicit feelings of profound grief, despair, fear, and anxiety.[21] Such feelings are not symptoms of a mental health disorder, but rather a rational response to the threatening realities of climate change.

Young people, including children, adolescents, and young adults, are particularly vulnerable to the mental health impacts of climate change. Because their bodies and nervous systems are still developing, children and adolescents are often more susceptible to both the physical strains and psychological stress of climate disruption.[22] Young people often have not fully developed the emotional resources needed to effectively cope with the stress induced by climate disasters.[23] Research shows that children and adolescents often experience more severe distress following climate events, compared with adults.[24,25] Additionally, climate modeling predicts that young people, though they bear little responsibility for causing climate change, will nevertheless bear the brunt of its consequences.[26] For example, recent research has projected that today's children will experience three times the number of climate disasters as their grandparents did;

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[16] Clayton, S., Manning, C. M., & Hodge C. (2014). *Beyond storms & droughts: The psychological impacts of climate change*. American Psychological Association and ecoAmerica.
[17] Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*. American Psychological Association and ecoAmerica.
[18] American Psychiatric Association. (2017, March). *Climate change and mental health connections*.
[19] Psychology and Global Health. (2019, November). *International Summit on Psychology and Global Health: A leader in climate action*.
[20] Yoder, K. (2021, October 4). *It's not just you: Everyone is Googling 'climate anxiety.'* Grist.
[21] Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change. *American Psychologist*, *66*(4), 265.
[22] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[23] Ibid.
[24] Fritze, J. G., Blashki, G. A., Burke, S., & Wiseman, J. (2008). Hope, despair and transformation: Climate change and the promotion of mental health and wellbeing. *International Journal of Mental Health Systems*, *2*(1).
[25] Somasundaram, D. J., & van de Put, W. A. C. M. (2006). Management of trauma in special populations after a disaster. *The Journal of Clinical Psychiatry*, *67 Suppl 2*, 64–73.
[26] Thiery, W., Lange, S., Rogelj, J., Schleussner, C.-F., Gudmundsson, L., Seneviratne, S. I., Andrijevic, M., Frieler, K., Emanuel, K., Geiger, T., Bresch, D. N., Zhao, F., Willner, S. N., Büchner, M., Volkholz, J., Bauer, N., Chang, J., Ciais, P., Dury, M., … Wada, Y. (2021). Intergenerational inequities in exposure to climate extremes. *Science*, *374*(6564), 158–160.

this has been called the “intergenerational inequality” of climate change.[27] Instead of enjoying a future full of opportunity and possibility as generations before them did, today’s young people face a future characterized by peril, loss, and uncertainty. As youth activist Luisa Neubauer has remarked, “We young generation are facing a future when we will spend every single living year within an escalating climate crisis, with no government acting adequately.”[28]

Indeed, many young people are struggling with negative emotions related to climate change. In the largest survey of young people’s thoughts and feelings about climate change to date, researchers queried 10,000 people ages 16-24 from 10 countries, including the United States.[29, 30] The results revealed that young people — both globally and within the U.S. — are exceedingly concerned about climate change and what it means for their future. Eight out of 10 young people said they worry that climate change is threatening people and the planet, with a full 59% of all respondents (and 48% of U.S. respondents) feeling “very” or “extremely” worried. Moreover, a large proportion of young people (45% of global respondents; 26% of U.S.) reported that this worry interferes with their daily functioning, such as their ability to eat, sleep, concentrate, perform at work and school, engage in leisure activities, and maintain relationships. Young people also expressed intense fears about the future. Roughly half of respondents endorsed the belief that they won’t have access to the same opportunities their parents had (55% global; 44% U.S.), that their family security will be threatened (52% global; 35% U.S.), and that the things they value most will be destroyed (55% global, 42% U.S.). What’s more, 75% of global respondents (68% of U.S.) said that the “future is frightening”, while 56% of global respondents (46% of U.S.) believed that “humanity is doomed.” These feelings were associated with perceptions that governments are not responding adequately to the climate crisis.[31,32]

If young people are particularly vulnerable to climate distress, then young people of color are doubly vulnerable. Indeed, research shows that Black, Indigenous, and people of color (BIPOC) are the groups most concerned about climate change.[33,34] This is likely because the burden of climate change impacts — pollution, increased temperatures, natural disasters — fall disproportionately on BIPOC communities.[35]

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[27] Thiery, W. et al. (2021). Intergenerational inequities in exposure to climate extremes.
[28] Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, E., Mayall, E., Wray, B., Mellor, C., & van Susteren, L. (2021, Sep 14). *How climate anxiety is linked to government inaction* [Global Study Launch].
[29] Marks, E., et al. (2021). Young people’s voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[30] Hickman (2021). *How climate anxiety is linked to government inaction*.
[31] Ibid.
[32] Ibid.
[33] Ballew, M., Maibach, E., Kotcher, J., Bergquist, P., Rosenthal, S., Marlon, J., & Leiserowitz, A. (2020, Apr 16). Which racial/ethnic groups care most about climate change? *Yale Program on Climate Change Communication*.
[34] Middleton, J., Cunsolo, A., Jones-Bitton, A., Wright, C. J., & Harper, S. L. (2020). Indigenous mental health in a changing climate: A systematic scoping review of the global literature. *Environmental Research Letters*, *15*(5).
[35] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

Research Questions

This study was designed to answer three primary questions.

1. What is known about the relationship between climate change and mental health, particularly among young people, including those who identify as BIPOC and/or reside in California?
2. What types of intervention approaches show the most promise for addressing climate anxiety, and what programs currently exist to support youth, in particular BIPOC youth, in California?
3. What are the most promising opportunities and future directions for this work?

Methods

To obtain the most comprehensive information and insights on this topic, we conducted a systematic literature review, supplemented with a series of interviews with climate mental health scholars and clinicians.

Systematic Literature Review

For the systematic literature review, we utilized online search engines such as Google Scholar, PubMed, and JSTOR to access peer-reviewed articles, and Google to access gray literature resource hubs and social media content.

Traditional keyword search with online search engines such as Google Scholar, PubMed, and JSTOR was used to access peer-reviewed articles and included words and/or word combinations. While not an exhaustive list, examples included: climate anxiety OR eco-anxiety OR eco-distress OR climate grief OR ecological grief OR eco-grief OR solastalgia OR climate emotions OR climate mental health, with and without population descriptors, such as children, adolescent, teen, young adult, Black OR African American, Indigenous OR Native, Latino/a OR Latinx, People of color, BIPOC, and vulnerable populations. Topical keywords such as resilience, self-care, nature exposure, nature connectedness, social justice, and activism, were also included. We also tailored our searches to California when appropriate. For example, in the literature review, we focused on studies that examined the impacts of wildfires and droughts, disasters common in California, when possible and appropriate; in the section on existing resources to cope with climate anxiety, we focused on interventions accessible to Californians. Google and social media platforms were used to access gray literature and content.

We used outlines from the preliminary literature scan as a guide to conduct a review of peer-reviewed literature (e.g., empirical research, systematic reviews), gray literature (e.g., reports and white papers, news articles, op-eds), resources hubs (e.g., organizational websites and/or project websites with lists of resources, toolkits), and social media platforms. We conducted several additional search strategies such as citation mining, backward search, forward search, and author citation. We focused on content published within the last six years (2016 - 2021), however seminal and foundational works on this topic published before 2016 were included.

Expert Interviews

In addition to our literature review, we conducted 30-60 minute interviews with eight preeminent scholars and practitioners in this field:

1. Susan Clayton, Professor of Psychology / Environmental Studies, College of Wooster
2. Leslie Davenport, Climate psychology educator, consultant, and psychotherapist
3. Thomas Doherty, Licensed psychologist and researcher
4. Jaqueline Patterson, Leader in environmental and climate justice
5. Jade Sasser, Feminist scholar of climate justice, reproductive politics, and the future
6. Kelsey Hudson, Research scientist and licensed psychologist, Boston University
7. Sarah Schwartz, Assistant Professor of Psychology, Suffolk University
8. Lena Fletcher, Natural Resources Conservation Chief Advisor, UMass Amherst

The expert interviews provided real-time insights on this quickly-evolving topic, information about resources in development, and access to valuable new findings and manuscripts either in preparation, in press, or under review (and thus not yet publicly available).

Our overall approach enabled us to streamline and synthesize information from a broad range of sources on the impact of climate change on the mental health of young people, which may inform future outreach, programming, and practices.

Report Overview

In the remainder of this report, we will first examine the various pathways by which climate change can impact mental health — including the effects of acute disasters such as wildfires and floods, as well as the effects of longer-term climate consequences such as rising temperatures and drought. We will discuss how an individual's degree of exposure can impact the severity of mental health outcomes; but that even those indirectly impacted can experience significant psychic suffering. Throughout, we will focus when possible on impacts in youth, a group that is known to be particularly vulnerable to climate-induced psychological distress. We will also examine other known risk factors that can sensitize individuals to climate distress, including the presence of concurrent stressors such as socioeconomic and demographic inequalities (racism, poverty). Next, we will discuss what can be done to address the mental health impacts of climate change in youth. We will identify core strategies for addressing climate distress and promoting emotional resilience, and explore the resources and interventions currently available to youth and BIPOC individuals in California. Finally, we will make recommendations for future research and intervention development to promote emotional well-being and resilience in these groups and the population at large.

Impacts of Climate Change on Mental Health

There are various pathways by which climate change can impact an individual's mental health and well-being. Climate change involves a range of environmental disruptions, including acute disasters, such as storms, heatwaves, floods, wildfires, and droughts, and the longer-term consequences of these events, such as economic and social changes and forced migration.[36] Globally, the frequency and severity of extreme weather events has accelerated rapidly in recent years, and is only expected to intensify.[37] For example, California has experienced three times the extent of wildfire damage in 2021 than it did in the same period of 2020 — a year in which the state recorded its worst fire season.[38] Climate change also involves more gradual climatic changes, such as rising sea levels, increases in temperatures, and changes in precipitation. These various manifestations and consequences of climate change can each have negative impacts on mental health and well-being.

Climate change can impact an individual's mental health **directly**, through first-hand experiences with climate change-induced disasters, such as one's home being flooded, or losing one's business to a wildfire. As climate change accelerates, the proportion of people directly impacted is rapidly growing. In 2009, the percentage of Americans who said they had personally experienced the effects of global warming was 32%; in 2020, this increased to 42%.[39] Individuals can also experience psychological impacts from **indirect** experiences of climate change, such as by bearing witness to changes in landscapes and loss of ecosystems, watching a climate change-induced disaster play out on the news, or learning about the effects of climate change through media or in educational settings. Figure 1, adapted from the Grantham Institute (2021), illustrates the multiple pathways by which an extreme weather event can impact mental health, including both immediate and longer-term direct impacts, as well as indirect impacts.[40]

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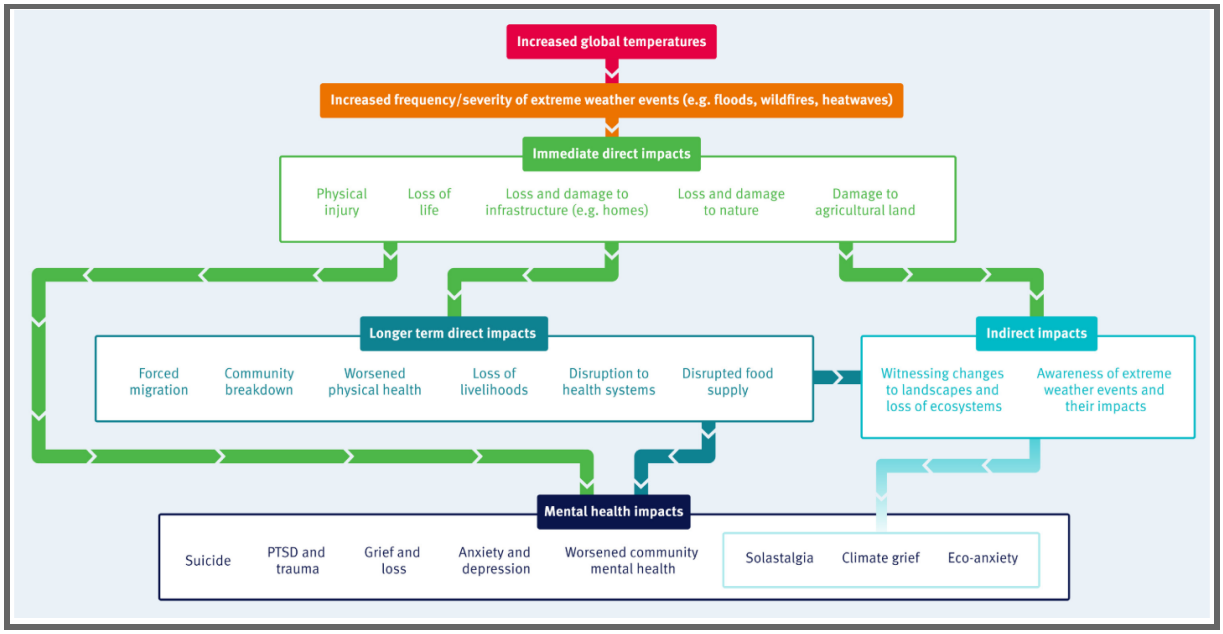
[36] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice.
[37] United Nations Office for Disaster Risk Reduction. (n.d.). *Climate action and disaster risk reduction*.
[38] Meeks, A., Silverman, H., & Sutton, J. (2021, July 13). *Wildfires in California this year have scorched 3 times more land than in the same period of last year's record season*. CNN.
[39] Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, Carman, J., Wang, X., Goldberg, M., Lacroix, K., & Marlon, J. (2021). *Climate change in the American mind: December 2020*. Yale Program on Climate Change Communication.
[40] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice.

Figure 1. Impacts of extreme weather events on mental health

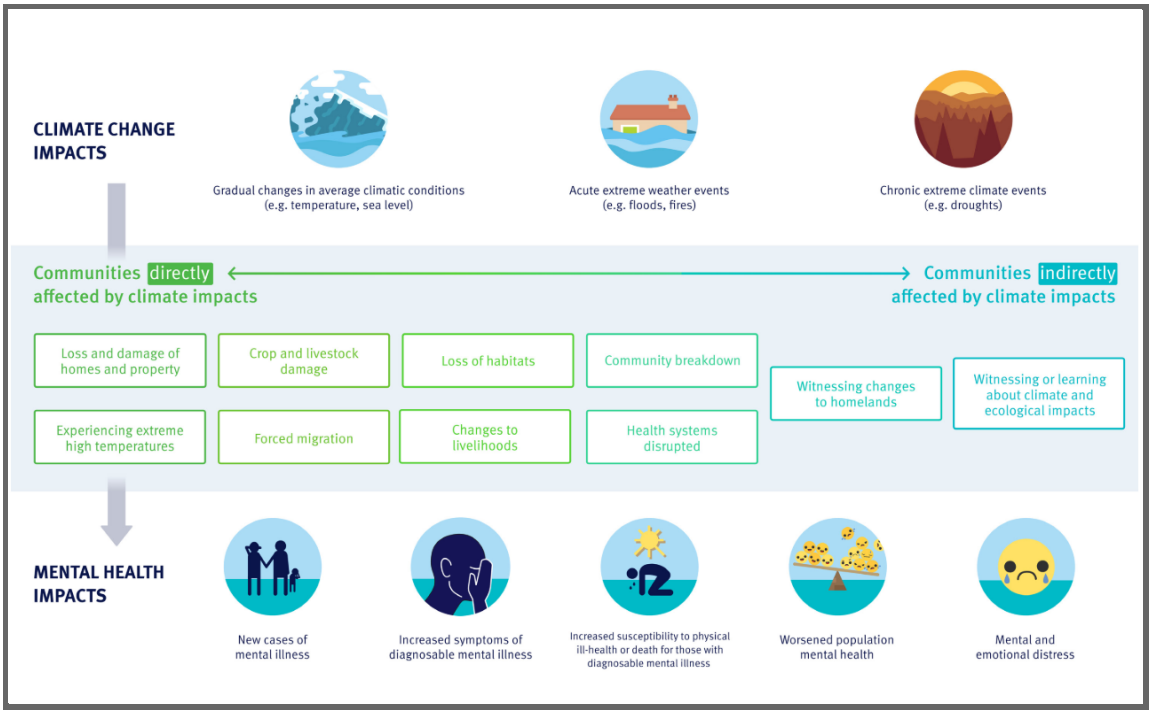


From Lawrance, E. et al. (2021).[41]

It is important to note that the degree to which an individual is impacted by climate change — directly or indirectly — is not a dichotomous concept but rather two ends of a spectrum, as illustrated in Figure 2.[42] A child who becomes distressed after learning about climate change in school may be considered indirectly exposed; on the other end of the spectrum, an individual who lost their home to a wildfire would be considered directly exposed. However, consider a child who is house-bound for a week (unable to play sports or play with friends) due to wildfire smoke, or a high school student whose school was closed due to flooding. Such individuals may not have experienced obvious "direct" exposure; yet, they have been exposed to climate change to a meaningful degree and can't be readily categorized as only "indirectly" exposed. Thus, the degree of exposure is best characterized as lying along a spectrum rather than in binary categories.

[41] Ibid.
[42] Ibid.

Figure 2. Spectrum of exposure to climate change



From Lawrance, E. et al. (2021).[43]

The mental health impacts of climate change can also manifest across a spectrum of severity, from mild to severe, chronic mental illness or even suicide. For most individuals, climate anxiety is not a pathological condition, but rather a rational response to a very real existential threat (see Figure 3). As scholar Joanna Macy has written, "If parts of our world that we loved were dying, we would expect to grieve. These feelings are normal, healthy responses." She adds, "They help us notice what's going on; they are also what rouses our response,"[44] underlining the practical aspect of these feelings, as they can help motivate individuals to make necessary lifestyle changes or engage in activism that can mitigate the source of the stress itself.

For other individuals, perhaps those with greater climate exposure or losses, concurrent and repeating exposures, or those with pre-existing sensitivities or conditions, a climate event can tip a person into diagnosable psychopathology, such as post-traumatic stress, generalized anxiety, major depression, or a substance use disorder. In between these extreme cases lies a broad swath of human experience, such as individuals who experience meaningful but subclinical levels of climate-related distress. As psychiatrist Adrienne van Nieuwenhuizen and colleagues remarked in a recent paper, "Clinicians will need to avoid pathologizing normal

[43] Ibid.
[44] Mulholland, M. (2021, February 23). *"None of us can go it alone if we want to make big change possible': On finding solace and solidarity in a broken-hearted world*. Earthjustice.

responses to the climate crisis, while also accurately detecting and diagnosing symptoms that meet criteria for mental health disorders."[45]

In this section, we will examine the range of effects that climate change can have on mental health and the many determinants of these differential mental health outcomes. Considering this wide range of climate-related mental health outcomes, it is clear that there can be no "one-size-fits-all" intervention approach, as will be discussed later in the second part of this report. Instead, individuals should have access to intervention and resilience-building strategies that are tailored to the severity of symptoms and level of impairment they are experiencing, as well as personal and contextual factors.

Figure 3. Climate anxiety as a rational response to a real threat

"Paying attention" by Pia Guerra, *The New Yorker*, 2018.[46]

Immediate Direct Impacts of Extreme Weather Events

Climate change-induced disasters such as wildfires, storms, floods, and heatwaves have a high potential to cause severe psychological stress and trauma, from physical injury, injury or loss of a loved one or pet, loss or damage to one's home, school, or property, and loss or disruption of one's livelihood.[47,48,49] Indeed, many people exposed to climate change-induced disasters

[45] Van Nieuwenhuizen, A., Hudson, K., Chen, X., & Hwong, A. R. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations. *Current Psychiatry Reports, 23*.
[46] Guerra, P. (2018, June 29). Daily Cartoon: Friday, June 29th. *The New Yorker*.
[47] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[48] Neria, P., & Schultz, J. M. (2012). Mental health effects of Hurricane Sandy: Characteristics, potential aftermath and response. *JAMA, 308*(24), 2571-2572.
[49] Simpson, D. M., Weissbecker, I., & Sephton, S. E. (2011). Extreme weather-related events: Implications for mental health and well-being. *In I. Weissbecker (Ed.), Climate change and human well-being: global challenges and opportunities* (pp. 57-78).

experience serious mental health consequences, including post-traumatic stress disorder (PTSD), generalized anxiety, and depression, which can often co-occur.[50,51] Increases in substance abuse and a higher risk of suicide are also commonly found following disasters.[52,53]

The potential for psychological trauma following a disaster likely depends on the scale of the catastrophe and the degree of exposure experienced by an individual.[54] For example, a study of 725 California residents (average age of 27) after the deadly and destructive 2018 Camp Fire found that individuals who were directly exposed to the fire experienced more severe symptoms of post-traumatic stress, depression, and anxiety, compared with individuals who witnessed or learned about the fire but were not directly exposed.[55]

Among those highly affected by a given disaster, rates of PTSD, depression, and anxiety run high. In the aftermath of Hurricane Katrina, one in six people living in an affected area met the diagnostic criteria for PTSD, 49% developed an anxiety or mood disorder such as depression, and suicide and suicidal ideation more than doubled.[56,57,58] Following Hurricane Sandy, 14.5% of directly exposed individuals exhibited PTSD symptoms,[59] and 15.6% of directly affected individuals showed PTSD symptoms several years after experiencing intense bushfires.[60]

Studies focusing specifically on post-disaster mental health impacts in children and adolescents have also found high levels of post-traumatic stress, depression, and anxiety symptoms. For example, a study examining 3,070 middle and high school students (grades 7-12) exposed to the Fort McMurray wildfire in Canada found that 37% met criteria for probable PTSD, 31% for probable depression, 27% for probable anxiety, and 15% for probable alcohol or substance use

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[50] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[51] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice.
[52] Kessler, R., Galea, S., Gruber, M., Sampson, N., Ursano, R., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry, 13*, 374–384.
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[54] Clemens, V., von Hirschhausen, E., & Fegert, J.M. (2020). Report of the Intergovernmental Panel on Climate Change: Implications for the mental health policy of children and adolescents in Europe—a scoping review. *European Child & Adolescent Psychiatry.*
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disorder.[61] Students with greater impact from the wildfire exhibited significantly higher scores on these outcomes.[62] Studies of children and adolescents following other forms of natural disasters have revealed similar results. For example, a study of children exposed to a hurricane found that 35% exhibited moderate or severe post-traumatic symptoms.[63] Following a major flood, 37.9% of children and adolescents (ages 7-18) exhibited moderate or severe emotional distress, including post-traumatic stress, depression, and anxiety symptoms.[64] A systematic review of 85 studies of child and adolescent survivors of disaster found rates of diagnosable PTSD of up to 60% and diagnosable depression up to 33%.[65] Additionally, several reports have implicated disaster-related trauma as a risk factor for substance abuse in adolescents.[66,67,68]

Although symptoms of depression, general anxiety, and PTSD often resolve or lessen over time, they can persist or even increase as time goes on, or be reactivated by subsequent climate disasters. Northern California residents exposed to the deadly wildfires of 2017 and 2018 re-lived those experiences during the fires of 2019, reactivating their depressive and posttraumatic stress symptoms.[69] Among Hurricane Katrina survivors, symptoms of PTSD, mood disorders, and suicidal ideation significantly increased nearly two years after the hurricane, largely due to unresolved stressors related to the disaster.[70] Six months after Hurricane Maria in 2016, 66% of the residents of Punta Santiago, Puerto Rico, exhibited clinically significant increases in symptoms of major depression, generalized anxiety, or PTSD.[71]

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[61] Brown, M. R., Agyapong, V., Greenshaw, A. J., Cribben, I., Brett-MacLean, P., Drolet, J., ... & Silverstone, P. H. (2019). Significant PTSD and other mental health effects present 18 months after the Fort Mcmurray wildfire: Findings from 3,070 grades 7–12 students. *Frontiers in Psychiatry*, *10*, 623.
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[63] La Greca, A. M., Silverman, W. K., Lai, B., & Jaccard, J. (2010). Hurricane-related exposure experiences and stressors, other life events, and social support: Concurrent and prospective impact on children's persistent posttraumatic stress symptoms. *Journal of Consulting and Clinical Psychology*, *78*(6), 794.
[64] Poulsen, K. M., McDermott, B. M., Wallis, J., & Cobham, V. E. (2015). School-based psychological screening in the aftermath of a disaster: Are parents satisfied and do their children access treatment? *Journal of Traumatic Stress*, *28*(1), 69-72.
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[71] Ferré, I. M., Negrón, S., Shultz, J. M., Schwartz, S. J., Kossin, J. P., & Pantin, H. (2019). Hurricane Maria's impact on Punta Santiago, Puerto Rico: Community needs and mental health assessment six months postimpact. *Disaster Medicine And Public Health Preparedness*, *13*(1), 18-23.

Long-term Direct Impacts of Extreme Weather Events

Climate disasters are often followed by a cascade of aftereffects, as illustrated in Figure 1. The aftereffects most relevant to the lives of young people are often displacement, negative changes in their parents or primary caregiver, and changes in their school environment (e.g., school closures due to disaster impacts, or having to move schools due to relocation or displacement). These longer-term impacts of extreme weather can cause significant distress and mental health sequelae for children, adolescents, and young adults.[72]

Displacement

Extreme weather events, including wildfires, floods, and storms, often result in the destruction or damage of homes and the subsequent displacement of families. The loss of one's home and personal property, as well as the need to secure new housing, constitutes a severe stressor for families and individuals. One study assessed health and social service needs in 668 households displaced by Hurricanes Katrina and Rita and living in FEMA-subsidized housing.[73] Results clearly indicated major detriments to mental health in both children and adults, compounded by diminished psychiatric care access. Nearly half of the parents reported that at least one child in their household developed new emotional or behavioral problems, such as feeling sad or depressed, being nervous or afraid, or having problems sleeping or getting along with others. Moreover, parents, and mothers in particular, exhibited high levels of psychological distress, with nearly half of female caregivers scoring in the clinically significant range.[74]

Parent or Caregiver Stress

Parents can have difficulty coping with the many stressors that face them following a major disaster, and their ability to parent effectively can be compromised. For example, in the above-mentioned survey of households living in FEMA-subsidized housing after Katrina, women caregivers were almost nine times as likely to report that they were not coping well with the daily demands of parenting when compared to parents in a pre-Katrina survey of urban Louisianans.[75] Children can become highly distressed when their caregivers' ability to protect or care for them is impaired, or when they witness caregivers experiencing fear and stress themselves. In the same study, the level of distress exhibited by a parent or caregiver was found to be significantly related to their children's distress. Children whose parents exhibited high levels of distress were nearly twice as likely to have experienced emotional or behavioral problems after Katrina.[76]

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[72] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice.
[73] Abramson, D. M., & Garfield, R. M. (2006). *On the edge: Children and families displaced by Hurricanes Katrina and Rita face a looming medical and mental health crisis*. Columbia University, Mailman School of Public Health.
[74] Ibid.
[75] Ibid.
[76] Ibid.

The idea that a young person's response to a disaster may be mediated by the response of their parents is supported by another study, this time of schoolchildren exposed to a major bushfire in Australia.[77] Children in this study exhibited posttraumatic stress symptoms that did not diminish over 18 months, suggesting that they were markers of significant and persistent developmental trauma. Moreover, the mother's responses to the disaster were better predictors of the presence of posttraumatic symptoms in children than the children's degree of exposure to the disaster. This relationship seemed to be explained by both the experience of intrusive memories by the mothers, and a changed pattern or quality of parenting.[78]

Disruptions in Education Access

Extreme weather events can damage or destroy schools, or make them inaccessible to students and teachers. For example, after Hurricane Katrina, approximately 196,000 public school students changed schools, and many of them missed a month or more of schooling.[79] Hurricane Katrina also affected university students, who were evacuated from local colleges and universities (e.g., Loyola University, Tulane University, University of New Orleans, Xavier University) due to the hurricane, just weeks into their fall semester. Some students were able to re-enroll in less-affected colleges, such as Louisiana State University. A study examined the effects of such displacement (i.e., moving and changing universities) and trauma exposure on students. Results indicated displaced students experienced more trauma exposure and greater subsequent distress, more symptoms of PTSD, and more symptoms of depression, compared with students who had not had to change universities.[80]

Research has also investigated the impacts of wildfire on concentration and academic performance in youth. In Blue Shield's NextGen Climate Survey (which included 1,200 respondents ages 14-24 across the U.S.), 26% of youth said that an environmental event or natural disaster had impacted their ability to concentrate in school.[81] Another study examined changes in academic scores among primary school children following a major bushfire in Australia. Unsurprisingly, schools that had been highly impacted by the wildfire did not perform as well as schools less impacted by the fires.[82]

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[77] McFarlane, A. C. (1987). Posttraumatic phenomena in a longitudinal study of children following a natural disaster. *Journal of the American Academy of Child & Adolescent Psychiatry*, *26*(5), 764-769.
[78] Ibid.
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[81] Blue Shield of California. (2021, April 15). *Gen Z youth say climate change is adversely affecting their physical and mental health in new national survey by Blue Shield of California*. Blue Shield of California.
[82] Gibbs, L., Nursey, J., Cook, J., Ireton, G., Alkemade, N., Roberts, M., Gallagher, H. C., Bryant, R., Block, K., Molyneaux, R., & Forbes, D. (2019). Delayed disaster impacts on academic performance of primary school children. *Child Development*, *90*(4), 1402–1412.

Chronic and Gradual Impacts of Climate Change

In addition to acute extreme weather events, climate change also engenders chronic extreme climate events (e.g., droughts), as well as more gradual adverse changes (e.g., increases in temperature, air pollution, vector-borne illnesses, rising sea levels). While disasters can have acute traumatic consequences on wellbeing, chronic and more protracted climate change processes may lead to more long-term, gradual impacts on mental health.[6] Most of the research in this area has focused on the impact of increased temperatures, drought, and food and water insecurity on mental health.

Increased Temperatures

The link between warmer weather and increased aggression and violence has been extensively documented. Experimental laboratory studies have demonstrated a causal relationship between higher temperatures and aggression.[83,84] Among 1,287 children and adolescents (aged 9-18 years old) in Los Angeles, California studied longitudinally over several years, rising average temperatures were significantly associated with increases in aggressive behaviors.[85] The association between warmer temperatures and increased violence may be explained by the impacts of heat on arousal, which results in decreases in attention and self-regulation, and increases in the availability of negative and hostile thoughts.[86,87]

Higher temperatures have also been associated with increased emergency room visits for mental and psychosocial problems.[88,89] For example, a study that assessed mental health-related emergency room visits in California among 6- to 18-year olds found that the risk for emergency room visits for mental health disorders increased by 4.8% for every 10 degrees Fahrenheit increase in temperature, while emergency room visits for self-injury or suicide increased by 7.9%.[90] These findings are in line with other research identifying associations between higher average temperatures and suicide rates in adolescents.[91]

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[83] Anderson, C. A. (2001). Heat and violence. *Current Directions in Psychological Science*, *10*(1), 33-38.
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[91] Akkaya-Kalayci, T., Vyssoki, B., Winkler, D., Willeit, M., Kapusta, N. D., Dorffner, G., & Özlü-Erkilic, Z. (2017). The effect of seasonal changes and climatic factors on suicide attempts of young people. *BMC Psychiatry, 17*(1), 1-7.

Drought

Drought can also have negative impacts on mental health, particularly when sustained for a significant period of time. A series of two studies examined the mental health impacts for adolescents (ages 11-17 years old) of a severe, multiyear drought in rural Australia.[92,93] The first study, which was conducted near the onset of the drought, found no elevations in emotional distress among adolescents.[94] However, when the researchers re-examined adolescents in the area years later, when the drought had been ongoing for two years, adolescents reported significantly higher levels of psychological distress than those in the previous study, with 12% of adolescents exhibiting symptoms in the clinical range.[95] These results speak to the impacts of cumulative, chronic stress on adolescents. Moreover, focus groups conducted with the study participants revealed various reasons for this distress, including impacts of the drought on the environment ("I would like to see something growing — we only see dead stuff"), on the local community and migration ("Young people are moving out and not coming back — there is nothing to come back to"), family life ("The stress of the drought can pull families apart"), and uncertainty about the future and financial security ("People need to think about the big plans ahead — it's scary — a lot of opportunities have gone").[96]

Food and Water Insecurity

Soaring temperatures and drought have broken records across the Western United States in 2021, from Southern California to Nevada and Oregon. Due to the unprecedented "mega drought", California's water regulators prohibited thousands of farmers from drawing water from major rivers and streams for irrigation.[97] Combined with an unprecedented fire season that damaged crops and agricultural land, agriculture in the country's "breadbasket" is at profound risk.[98] Not only do such events cause great stress and even loss of livelihood for many agricultural workers and their families, but they also increase the risk of food and water insecurity for the entire country. Risks to food and water security are projected to increase as climate change continues to progress.[99]

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[92] Dean, J., & Stain, H. J. (2007). The impact of drought on the emotional well-being of children and adolescents in rural and remote New South Wales. *The Journal of Rural Health*, *23*(4), 356-364.
[93] Dean, J. G., & Stain, H. J. (2010). Mental health impact for adolescents living with prolonged drought. *Australian Journal of Rural Health*, *18*(1), 32-37.
[94] Dean, J., & Stain, H. J. (2007). The impact of drought on the emotional well-being of children and adolescents in rural and remote New South Wales.
[95] Dean, J. G., & Stain, H. J. (2010). Mental health impact for adolescents living with prolonged drought.
[96] Ibid.
[97] Sanchez, R., Meeks, A., & Colón, B. (2021, August 4). *California drought: Regulators vote to restrict water access for thousands of farmers amid severe drought*. CNN.
[98] Branford, S., & Scherer, G. (2021, August 4). *A world of hurt: 2021 climate disasters raise alarm over food security*. Mongabay: News & Inspiration from Nature's Frontline.
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The availability of food and clean water is not only a vital prerequisite for physical but also mental health.[100] Research indicates that food insecurity has profound implications for the mental health of young people. Nutrients, including vitamins and fatty acids, are vital for healthy brain development. Importantly, food insecurity causes profound stress for children, adolescents, and their families. Stress, particularly when high in intensity or chronic in duration, is a primary trigger for a wide swath of mental health disorders.[101]

Indirect Impacts of Climate Change on Mental Health

Detriments to mental health are not limited to individuals and communities directly impacted by a disaster. Suffering can also arise in individuals who bear witness to these events, for example by learning about growing climate threats or watching climate disasters play out in the news.[102] Thus, climate change can have **indirect** effects on mental health, as awareness of climate change threats and losses can lead to psychological distress.[103] This distress in response to climate awareness, often referred to as "climate anxiety", "eco-anxiety", or "eco-grief", is increasingly prevalent among youth. For example, a 2020 YouGov poll commissioned by Friends of the Earth reported that 70% of 18–24-year-olds are more worried about climate change than they were a year ago.[104] If climate distress goes unchecked or is compounded by the presence of other stressors of vulnerability factors, it can lead to anxiety, depression, grief, obsessive thoughts, panic attacks, sleep problems, and appetite changes.[105,106]

Characterizing Emotional Response to Climate Awareness

A variety of terms have been used to describe emotional distress caused by an awareness of climate change and environmental degradation, as summarized in Table 1. Each of these terms (or sets of terms) captures a distinct aspect of the negative thoughts and feelings induced by climate change. Terms such as "climate anxiety," "eco-anxiety," and "eco-distress" reflect the feelings of worry, fear, and anxiety related to climate change. Other terms, including "climate grief," "eco-grief," and "ecological grief" are more specific to feelings of despair related to experienced or anticipated ecological losses (e.g., deforestation, biodiversity loss). Another term, "solastalgia," refers to a sense of desolation and loss due to witnessing negative changes in one's local environment or community, such as seeing the forest you played in as a young child burn in a wildfire, or homes in your community overtaken or threatened by rising waters.

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[100] Clemens, V., von Hirschhausen, E., & Fegert, J.M. (2020). Report of the Intergovernmental Panel on Climate Change: Implications for the mental health policy of children and adolescents in Europe—a scoping review.
[101] Ibid.
[102] Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change.
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[105] Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change.
[106] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice.

Table 1. Eco-emotions: terms, definitions, and evidence

Term	Definition	Evidence
Climate anxiety/ Eco-anxiety/ Eco-distress	"The chronic fear of environmental doom."[6] May include anxiety, worry, stress, hopelessness, sleep disturbance, irritability, despair, and uncertainty about the future.[9,19] Includes bodily symptoms of anxiety, such as elevated heart rate, sweaty palms, and shortness of breath.[9]	Eco-anxiety has been observed in children,[107] adolescents,[108] college students,[109] and adults,[110] and may affect young people especially.[111, 112]
Climate grief/ Ecological grief/ Eco-grief	"The grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems and meaningful landscapes due to acute or chronic environmental change."[113]	Eco-grief can affect people with strong ties to place and those witnessing environmental destruction.[114,115] As climate disasters impact more people, this may become more widespread.[116]
Solastalgia	Distress experienced when one's home environment is negatively changing from extreme weather events or resource extraction (e.g., oil extraction, deforestation). Changes that attack someone's sense of home, even without dislocation, can create a deep homesickness.[117]	Solastalgia has been documented among residents of places damaged by tornadoes,[118] wildfires (in Arizona),[119] youth in Indonesia,[120] and Indigenous communities,[121] among others.

Adapted from Lawrance, E. et al. (2021).[122]

[107] Strife, S. J. (2012). Children's environmental concerns: Expressing ecophobia. *The Journal of Environmental Education, 43(1)*, 37-54.
[108] Ojala, M. (2013). Coping with climate change among adolescents: Implications for subjective well-being and environmental engagement. *Sustainability, 5(5)*, 2191–2209.
[109] Kelly, A. (2017). *Eco-anxiety at university: Student experiences and academic perspectives on cultivating healthy emotional responses to the climate crisis*. [Unpublished Independent Study]. University of Colorado at Boulder.
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[111] Swell Investing. (2018, April 17). *Nearly three in four millennials experience "ecoanxiety": The next generation leads the way in eco-friendly investing*. Cision PR Newswire.
[112] Clayton, S., & Karazsia, B. T. (2020). Development and validation of a measure of climate change anxiety.
[113] Cunsolo, A., & Ellis, N. R. (2018). Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*, *8*(4), 275–281.
[114] Ibid.
[115] Cunsolo, A., et al. (2014). Examining relationships between climate change and mental health in the Circumpolar North. *Regional Environmental Change*, *15*(1), 169–182.
[116] Marks, E. et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[117] Albrecht, G., Sartore, G.-M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., Stain, H., Tonna, A., & Pollard, G. (2007). Solastalgia: The distress caused by environmental change. *Australasian Psychiatry*, *15 Suppl 1*, S95–S98.
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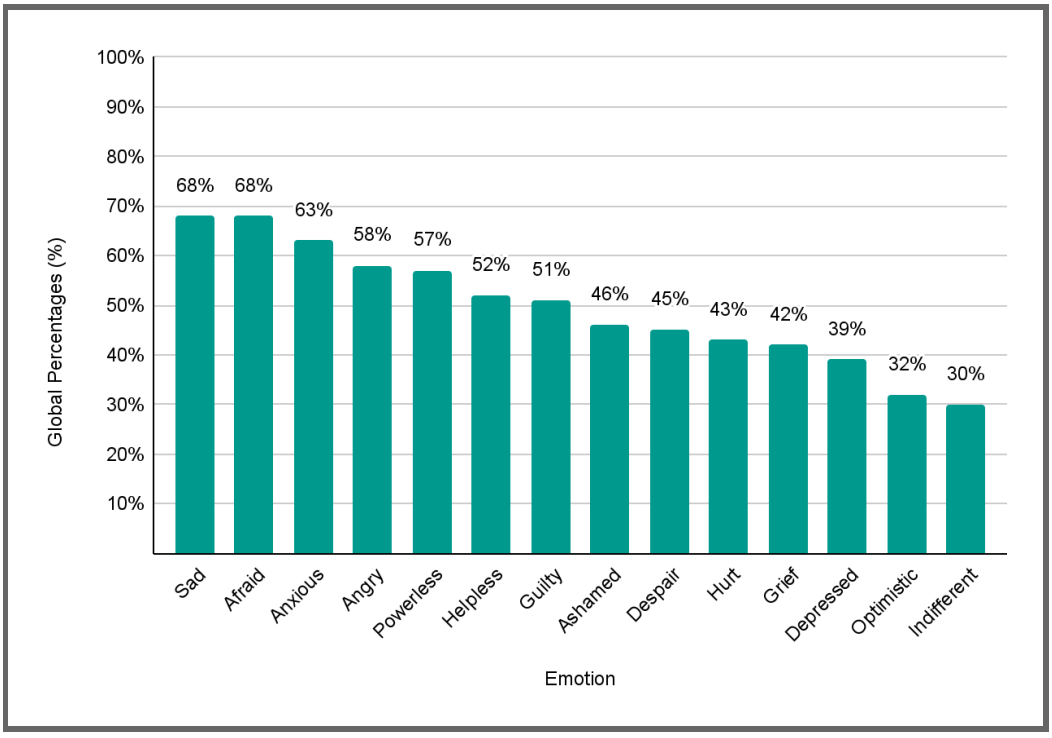
[120] Alam, M. (2018). Double exposure and fractal city: Cultural disengagement and disembodied belonging due to outdoor thermal changes. *Journal of Regional and City Planning*, *29*(1), 67.
[121] Cunsolo, A., & Ellis, N. R. (2018). Ecological grief as a mental health response to climate change-related loss.
[122] Lawrance, E. et al. (2021). The impact of climate change on mental health and emotional wellbeing: Current evidence and implications for policy and practice

The emotional response to climate change also includes a range of feelings beyond anxiety, grief, and solastalgia. In the previously mentioned *Lancet* global survey on young people's thoughts and feelings about climate change, youth reported a broad range of emotions in response to climate change, including feeling sad, afraid, angry, powerless, helpless, guilty, ashamed, despair, hurt, grief, optimistic, and depressed, as illustrated in Figure 4.[123] Youth in this study also reported feeling confusion, betrayal, and abandonment due to adult and government inaction towards climate change. Indeed, 65% of global youth and 63% of U.S. youth reported feeling that their government is "failing young people."[124] The wide range of emotions elicited by climate change in youth is also illustrated in Figure 5, which depicts a word cloud generated from responses by university students to questions about climate change.[125] See also Table 2 for a selection of first-person accounts from youth about their thoughts and emotions surrounding climate change.

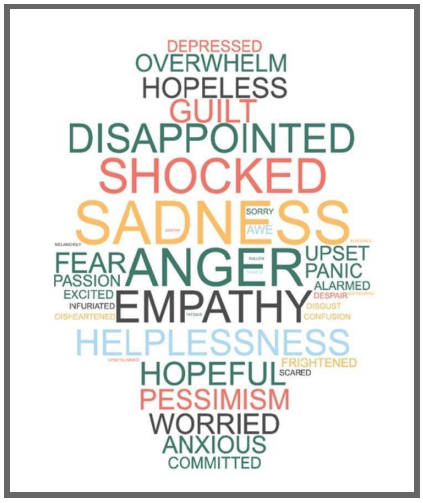
Figure 4. Climate-change related emotions reported by youth in a global survey



Recreated from Marks, E., et al. (2021).[126]

[123] Marks, E. et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[124] Ibid.
[125] Leimbach, T., Kent, J., Walker, J., & Allen, L. (2020). *Staying sane in the face of climate change: A toolkit of emerging ideas to support emotional resilience, mental health and action*. University of Technology Sydney, Australia.
[126] Marks, E., et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.

Figure 5. Word cloud generated from student responses to questions about climate change



From Leimbach, T., et al. (2020)[127]

Table 2. Expressions of Climate Emotions from Youth

Youth Voices
"What worries me about the future is the condition of the environment and planet, the animals and natural creations. I get deep anxiety and will spend time crying in my room because I'm scared for the planet." — High School Student (California)[128]
"My brother just had a baby in November, which was really exciting, so I have a niece and that has been a huge joy in my life. But it also at the same time was so heartbreaking, because I think about how when she gets to be my age, she might actually not ever get to see the snow-capped mountains. These places that I really want to bring her to, might not be there." — College student[129]
"I began thinking of all the families who have lived through much worse with less support than I have. I thought about the labor required to sift through that trauma and pain — or to hide it altogether. I stared at my window blinds as lights beamed inside pondering over our collective trauma: losing the world as we know it, the only world we've ever known...I let some tears fall... people have lost so much." — Yessenia Funes (young BIPOC climate activist)[130]

[127] Leimbach, T., et al. (2020). *Staying sane in the face of climate change: A toolkit of emerging ideas to support emotional resilience, mental health and action*.
[128] Grauer, S. R. (2020). Climate change: The thief of childhood. *Phi Delta Kappan*, *101*(7), 42-46.
[129] Grant, B. (2021). *Coping with the climate crisis: Investigating the mental health impacts of climate change on youth* [Bachelor's thesis]. University of Waterloo.
[130] Funes, Y. (2021, August 30). *We all deserve some help*. Atmos.

"What's the point in going to university, in incurring all those debts and fees, when there won't be a world in which I can have a career?" — High school student[131]

"I've always lived a 10-minute walk to the river. Its role in my life has changed along with the climate. As a child, we'd swim there almost every day and we'd skate on the shallow parts in the winter frequently. But after two floods… and unstable ice from the rapid freeze-thaw cycles, the river is also a frequent reminder that climate change is occurring. It's more of that reminder instead of what used to be a place of comfort and relaxation." — College student[132]

"I don't want to die. But I don't want to live in a world that doesn't care about children and animals." — Young study participant[133]

Range of Experience: Mild to Severe

As discussed above, experiences of climate distress can vary, from feelings of anxiety to grief to desolation. Often these emotions co-occur. Additionally, individuals can experience climate distress at varying levels of severity, from mild to severe.[134] Caroline Hickman, a practicing psychotherapist and leading researcher in climate distress among youth, has characterized the different levels of distress that she often encounters among her young patients.[135]

According to Hickman, an individual experiencing **mild** climate distress may experience some feelings of upset, but these are transient, inconstant, and resolve easily with reassurance. These individuals likely display optimism and trust that powerful "others" (e.g., scientists, technology developers, the government) will solve the crisis. There is also a tendency to avoid more painful feelings such as depression or despair.[136]

Individuals experiencing **medium** symptoms may feel upset more frequently (such as weekly) and may be somewhat less optimistic about the future but still hold a fundamental belief that solutions will eventually be found and faith in experts and leaders to find solutions. There may be some disruption in thinking and cognition, but overall individuals are not preoccupied with the crisis. They may be willing to make minimal lifestyle changes such as reducing meat consumption or flying, but overall maintain their regular lifestyle. They are still able to be reassured by discussions with others.[137]

[131] Sharp, V., & Hickman, C. (n.d.). *Eco-anxiety, eco-despair, eco-depression, eco-grief? Or maybe .....eco-empathy?*
[132] Grant, B. (2021). *Coping with the climate crisis: Investigating the mental health impacts of climate change on youth* [Bachelor's thesis].
[133] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[134] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[135] Ibid.
[136] Ibid.
[137] Ibid.

These individuals are still capable of being reassured in discussion with others. In contrast, those with **significant** distress experience daily upset and feelings of distress with an awareness that the crisis is accelerating. Fears about climate change may be accompanied by fears of social collapse, and anxiety in these individuals is difficult to dispel with reassurances. These individuals exhibit little faith in others to solve the climate crisis, and often experience guilt and shame when thinking about future generations. Individuals with severe distress may end relationships with people who continue to deny the existence of climate change. According to Hickman, these individuals are often more willing to undertake large lifestyle changes, such as deciding not to have children or committing to stop flying.[138]

Finally, individuals with **severe** distress may experience significant impairment such as intrusive thoughts, sleep disruption, and an inability to enjoy any aspect of life due to fears about the future. These individuals do not have any faith in others to act or take steps to mitigate the crisis. They may be unable to manage their emotional responses, often crying or experiencing angry outbursts. They may not be able to maintain employment due to disruptions in emotions and thinking. They may also experience severe disruption to other aspects of life such as not paying bills or rent, with the reasoning that nothing matters given the impending crisis. This category includes individuals who engage in suicidal ideation or planning as a result of climate change.[139]

In her book, *A Field Guide to Climate Anxiety*, author and university professor Sarah Jacquette Ray provides examples of individuals with significant or severe climate-related distress. She recalls a student who wrote an essay about how her environmental values led to such severe eco-guilt that she stopped consuming food. At the grocery store, when she could not decide on a purchase that would not "somehow contribute to ecological, social, and personal health problems" she would "leave without food altogether, deciding that it was better to go hungry than to make the wrong decision" (quotes are the student's words).[140] Another example is the civil rights attorney turned environmental advocate David Buckel, who in 2018 committed suicide by self-immolation with gasoline, stating in his suicide note that ending his life represented what we're all doing to ourselves by relying on fossil fuels.[141]

[138] Ibid.
[139] Ibid.
[140] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*. University of California Press.
[141] Ibid.

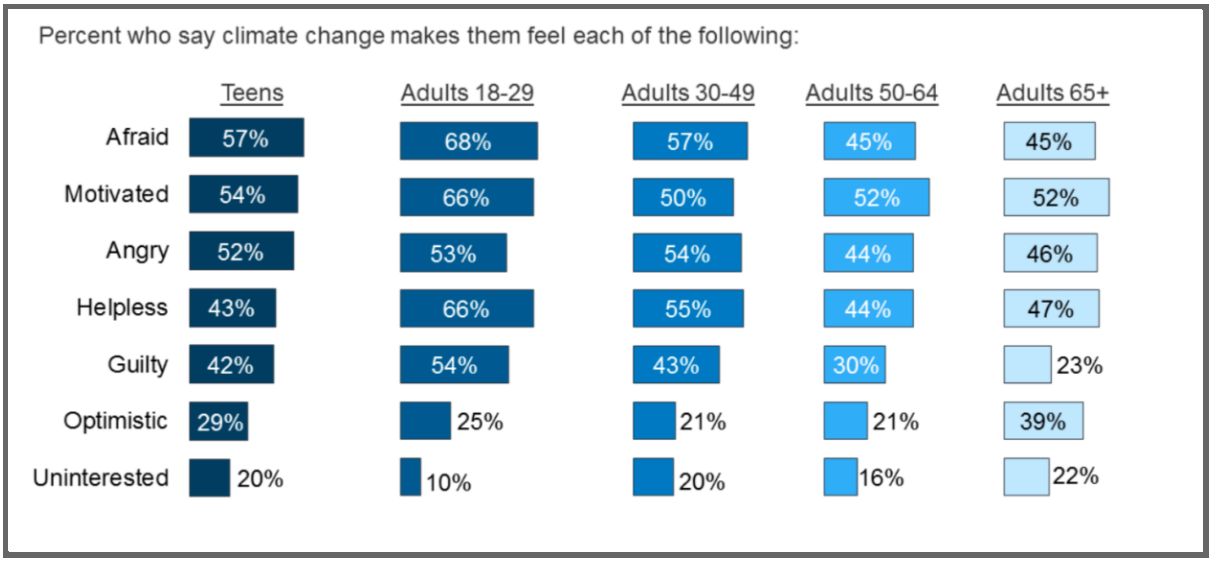
Prevalence

Climate anxiety is highly prevalent, and is becoming more widespread as climate change accelerates. In October 2021, the Yale Program for Climate Communication completed their latest nationally representative survey of adults (*n* = 1,006; age 18 years and older) and found that views about climate change shifted significantly compared with just 6 months prior. They found that an all-time record 70% of Americans were now "very worried" or "somewhat worried" about global warming. Those in the "very worried" category had increased a full 10 percentage points (from 25% to 35%) since the organization's poll just 6 months earlier, in March 2021.[142] These findings are similar to findings from a 2020 American Psychiatric Association poll administered to 1,004 U.S. adults, which found 67% of respondents were "extremely anxious" or "somewhat anxious" about effects of climate change on the planet, while 55% were "extremely anxious" or "somewhat anxious" about the effects of climate change on their mental health.[143]

Surveys that have examined concerns about climate change by different age groups have found the prevalence of climate distress to be highest among young adults. In the American Psychiatric Association poll mentioned above, younger adults were more likely to be concerned about the impact of climate change on their mental health, compared with older adults: 67% of Gen Zers (18-23 years) and 63% of millennials (24-39 years) were somewhat or very concerned about the impact of climate change on their mental health, compared to 58% of Gen Xers (40-55 years) and 42% of baby boomers (56-74 years).[144] Survey data that has included younger participants (teens) in addition to adults have similarly found that climate concerns are most prevalent among young adults. A 2019 survey sponsored by the Kaiser Family Foundation and The Washington Post included 2,293 U.S. adults (divided into four age groups, including young adults ages 18-29) and 629 teens (ages 13-17).[145] Findings indicated that climate change evokes a variety of emotions for all age groups, including teens (Figure 5). However, young adults (ages 18-29) were the age group to report the highest prevalence of negative emotions, including "afraid" (68%), angry (53%), "helpless" (66%), and "guilty" (54%). Interestingly, this young adult group also reported the highest prevalence of motivation (66%) of any age group,[146] supporting the idea that emotional responses to climate change can be productive in motivating and inciting action against climate change.

[142] Yale Program on Climate Change Communication. (2021, October 1). *Dramatic increase in public beliefs and worries about climate change*.
[143] American Psychiatric Association (APA). (2020, October 21). *New APA poll reveals that Americans are increasingly anxious about climate change's impact on planet, mental health*.
[144] Ibid.
[145] Hamel, L., Lopes, L., Muñana, C., & Brodie, M. (2019, November 27). *The Kaiser Family Foundation/Washington Post climate change survey*. KFF.
[146] Ibid.

Figure 5. Emotions about climate change by age group



From Hamel, L. et al. (2019, November 27)[147]

Other surveys have specifically focused on climate distress among youth. Surveys focused on children, adolescents, and young adults specifically have shown that distress about climate change and environmental degradation is highly prevalent. A 2020 BBC survey of 2,000 UK children aged 8-16 found that 73% said they were worried about the state of the planet (with 22% "very worried"), 19% reported having had a bad dream about climate change, and 41% reported that they did not trust adults to tackle the challenges presented by climate change.[148] Studies in older teens and young adults have revealed similar findings. The 2021 *Lancet Planetary Health* global survey of 10,000 youth ages 16-24 (the largest of its kind) found that 59% of adolescents and young adults reported feeling "very" or "extremely" worried about climate change, and 45% reported that this worry interferes with their daily lives.[149] Respondents also reported a lack of faith in their governments' response to the crisis; 65% endorsed the statement that the government is "failing young people", 60% endorsed that their government is "dismissing people's distress", and 58% endorsing feelings of betrayal by their government. The high prevalence of concern among youth related to climate change is supported by other research, including BSC's NextGen Climate Survey.[150] Research also suggests that concerns about climate change vary significantly as a function of political affiliation in the U.S.[151]

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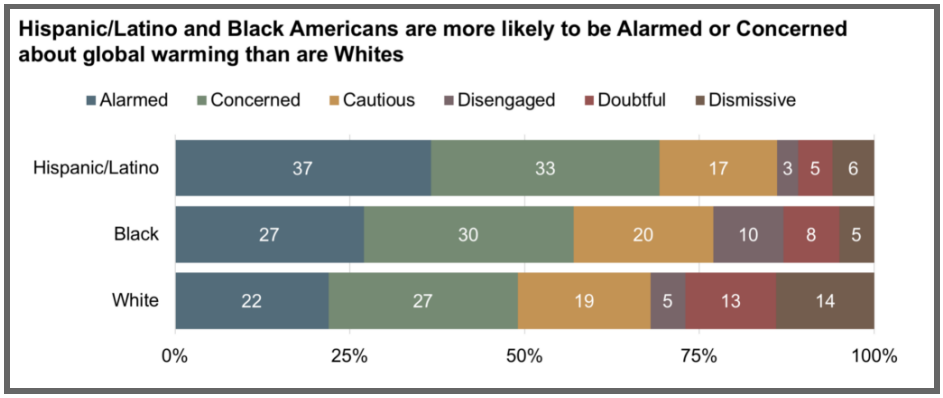
[147] Ibid.
[148] Atherton, R. (2020). *Climate anxiety: Survey for BBC Newsround shows children losing sleep over climate change and the environment*.
[149] Marks, E. et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[150] Blue Shield of California. (2021, April 15). *Gen Z youth say climate change is adversely affecting their physical and mental health in new national survey by Blue Shield of California*.
[151] Mildenberger, M., Marlon, J., Howe, P., & Leiserowitz, A. (2020, July 1). *Democratic and Republican views of climate change (2018)*. Yale Program on Climate Change Communication.

Racial/Ethnic Differences

Most research in this area does not examine racial differences in emotional reactions to the climate crisis. However, 2019 survey data from the Yale Program on Climate Change Communication and George Mason University in 2,386 U.S. adults suggested that Hispanic/Latino and Black Americans were more likely to be “alarmed” or “concerned” about climate change, relative to White Americans (Figure 6).[152]

Figure 6. Racial/ethnic differences in concerns about global warming



From Ballew, M. et al. (2020, Apr 16)[153]

Research conducted by Jade Sasser, Ph.D., supports the idea that important racial differences may exist in climate change concern.[154] In a panel on climate anxiety, Sasser shared insights from a soon-to-be-published survey of 2,500 young people, half of whom identified as BIPOC, on emotions related to climate change. According to Sasser, racism cannot be separated from the broader conversations on climate change. A key survey finding was that among those “who did not have children and who did not want them, 20% indicated that it was primarily because they feared racism and racial violence.” Sasser then shared qualitative data representing the experiences of young Black and U.S.-based Guatemalan women, with a Black woman stating:

> I'm undecided about children. We're totally dependent on the things that are driving climate change. So it's going to leave a disastrous problem for our kids to clean up. But the racial politics in this country make me deathly afraid to have a child even more so than climate change. Because if everyone is burning up, the government will do something about it. But we have a long history of people ignoring the problems that hurt people of color the most. So although climate impacts are worse in our communities, I don't think we'll get an equal share of the resources that we need to survive.[155]

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[152] Ballew, M. et al. (2020, Apr 16). Which racial/ethnic groups care most about climate change?
[153] Ibid.
[154] Hickman, C., Clayton, S., Pihkala, P., van Sustren, L., Wray, B., Mellor, C., Leandowski, E., Ogunbode, C., Weintrobe, S., Sasser, J., Blanche, V., & Langford, K. [Climate Psychology Alliance]. (2021, October 20). *Climate anxiety in young people: Academic perspectives and broader social implications* [Video]. Youtube.
[155] Ibid.

These insights demonstrate the social inequalities and vulnerabilities experienced by BIPOC in the U.S. that are too often disregarded. In an interview with Sasser, she called for research to center on BIPOC populations to better understand the range of emotional and psychological impacts, as well as the culturally-tailored resources needed to address them (J. Sasser, personal communication, October 19, 2021).

Climate Emotions Shape Major Life Decisions

For the growing contingent of youth living with climate distress, climate emotions inform important life decisions, such as where an individual chooses to live, what career they pursue, and whether or not they decide to go to college or have children. A 2020 survey, which included 2,000 Americans split evenly across four generations (Generation Z, millennials, Generation X, and baby boomers) found that climate change has negatively affected 59% of respondents' mental health (71% for millennials and 67% for Gen Z). Half of Gen Zers said their career path had changed due to climate change, and 73% of millennials say climate change impacted where they planned to live. Moreover, a staggering 78% of Gen Zers and 70% of millennials weren't planning (or didn't want) to have children of their own as a result of climate change.[156] In the global survey of 10,000 youth (16-25 years) from ten countries, the figure was lower but still quite substantial; findings from that study indicated that a full 41% percent of youth said they were hesitant to have children because of climate change.[157] The BirthStrike movement, out of the UK, has provided a public forum for people committed to not bearing children due to the severity of the climate crisis and the failure of governments to act adequately.[158]

Data from the survey in Dr. Jade Sasser's presentation suggests that emotions around climate change coupled with experiences of racism may shape the reproductive choices of people of color. Future parenting plans are expressions of an individual's feelings and projections about the future. Altering parenting plans due to climate change underlines the potentially heightened sense of vulnerability and insecurity about the future among people of color.[159] This is in line with the fact that communities of color often experience increased impacts of climate change.[160]

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[156] Haaland, M. (2021, September 6). *Majority of young American adults say climate change influences their decision to have children*. SWNS Digital. **NOTE**: The methods of this survey were not made available, so we cannot determine the quality of this survey data. The percentages cited could be artificially high due to selection bias or other issues. While the percentages may not be accurate, the general findings that the reality of climate change impacts important life decisions among youth is supported by other research.

[157] Marks, E., et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.

[158] Hunt, E. (2019, March 12). *BirthStrikers: Meet the women who refuse to have children until climate change ends*. The Guardian.

[159] Hickman, C. et al. (2021, October 20). *Climate anxiety in young people: Academic perspectives and broader social implications* [Video].

[160] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

Youth Feel Ignored, Dismissed, and Belittled

Young people often report feeling ignored, dismissed, and/or belittled when they try to discuss their worries about climate change with adults, and say that this treatment makes them feel isolated, alone, confused, and angry. In her 2020 paper on this topic, Caroline Hickman (the previously mentioned psychotherapist and researcher who specializes in youth climate distress) wrote, "Increasingly during 2020 there are repeated themes emerging of young people not knowing who they can safely talk with about their anxieties about the future." She continued, "Some have talked about feeling dismissed and belittled when they have tried to get help from professionals and parents, others have talked about feeling they are being asked to find the solutions to the climate crisis when they talk about their fears." Hickman went on to quote a 14-year-old youth:

> What I don't get is why everyone isn't running around the streets screaming in fear, that's what they should be doing if they knew how bad it was going to get, how bad it already is in some places in the world. Instead I'm told by grown-ups to stop worrying and go back to school. All they have to do is look at what's going on, I don't get it, why can't they see it?! They say I'm the one with the problem because I'm scared; but I'm even more scared because they are not scared. They should be. I'm living in the twilight zone! Help me![161]

Indeed, quantitative research shows that many young people feel that their distress about climate change is dismissed or disregarded. In the above-mentioned BBC survey, more than half (59%) of respondents said they didn't think their voices were being heard on climate change.[162] In the previously mentioned youth global survey, among youth who said they had spoken with others about climate change (81.2% of global respondents), almost half (48.4%) said that other people had ignored or dismissed them.[163]

This data underscores the need for caregivers and educators to initiate conversations with youth about climate change and its emotional impact in a way that acknowledges and validates the distress they are experiencing and allows them to feel supported in taking action against climate change.

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[161] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[162] Atherton, R. (2020). *Climate anxiety: Survey for BBC Newsround shows children losing sleep over climate change and the environment*.
[163] Marks, E. et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.

Who is Most Vulnerable? Risk Factors

Although climate change has the potential to cause emotional distress for all young people, it does not impact all communities or individuals equally. We previously discussed how the effects of climate change on an individual's mental health and well-being can depend on the degree of exposure to climate change impacts, with those most severely and directly impacted often suffering the biggest detriments to mental health. Other factors also play an important role in determining vulnerability to climate change impacts, including the broader personal and social context in which this exposure occurs. This context includes the individual's personal characteristics, such as their age, gender, stress reactivity, and pre-existing mental or physical health conditions, as well as the broader social and economic context in which they live, including their socioeconomic status, exposure to racism, and education access (Figure 7). Pre-existing stressors, including but not limited to racism, poverty, and chronic health conditions and disabilities, can deplete individuals' psychological, social, and/or financial resources, leaving them with a diminished capacity to cope with the added stress of climate change.

Climate change has been increasingly recognized as a social determinant of young people's mental health, both contributing to and interacting with other social determinants including racism, poverty, housing instability, and limited education access.[164,165,166] The intersection of climate change and its differential impacts on human rights has been aptly termed "climate justice," with implications ranging from social, economic, and public health issues.[167] While everyone is impacted by climate change, some populations are particularly vulnerable to the mental health-related impacts of climate change. These populations of concern include, but are not limited to: communities in high-exposure areas; young people; individuals with pre-existing trauma, chronic illness or disability; girls and women (particularly pregnant or parenting); low-income and disadvantaged communities; people who identify as BIPOC; and isolated individuals.[168]

Climate justice recognizes that those who are least responsible for climate change experience the greatest negative impacts on their health and wellbeing, reinforcing and compounding disparities.[169] As such, there has been an urgent call to address the mental health needs of those disproportionately impacted by climate change.[170]

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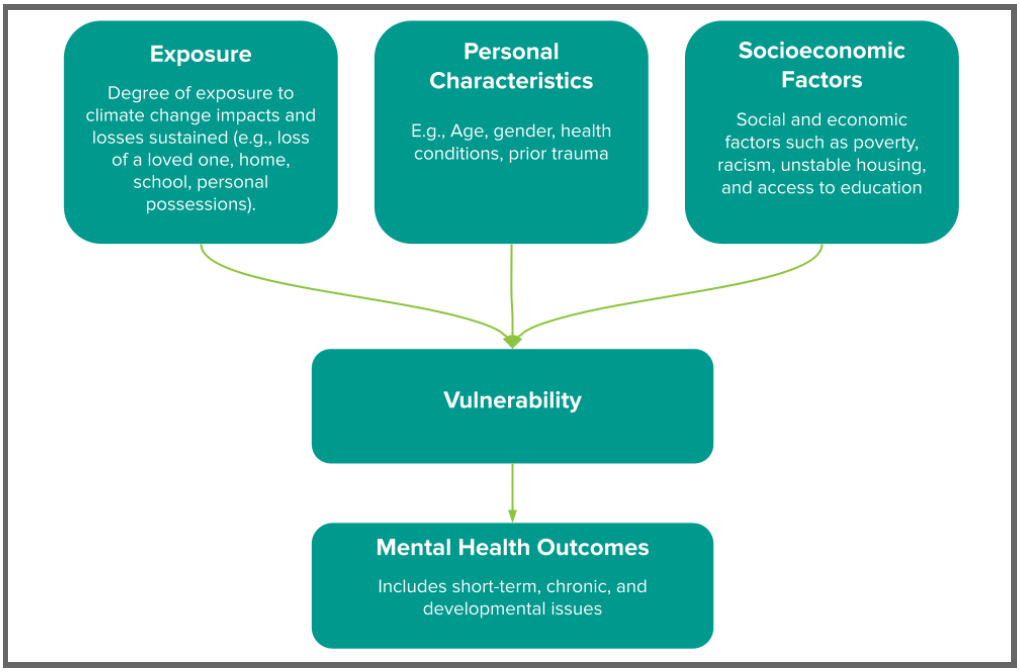
[164] Ragavan, M.I. et al. (2020). Climate change as a social determinant of health.
[165] World Health Organization and Calouste Gulbenkian Foundation. (2014). *Social determinants of mental health*.
[166] Van Nieuwenhuizen, A. et al. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations.
[167] Nicholas, P. K., & Breakey, S. (2017). Climate change, climate justice, and environmental health: Implications for the nursing profession. *Journal of Nursing Scholarship, 49*(6), 606-616.
[168] Davenport, L. (2017). *Emotional resiliency in the era of climate change: A clinician's guid*e. Jessica Kingsley Publishers.
[169] Nicholas, P. K., & Breakey, S. (2017). Climate change, climate justice, and environmental health: Implications for the nursing profession.
[170] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

Figure 7. Personal and social determinants of mental health impacts



Adapted from U.S. Environmental Protection Agency (2020)[171]

Exposure

The relationship between exposure to climate change and the severity of mental health impacts has been introduced in a prior section of this report. To summarize briefly, the impact a disaster has on the health of a population can be described as having a "dose-response" relationship: the larger the "dose" of a disaster an individual or community experiences, the greater the mental and physical health impact (the "response").[172] Studies have shown that individuals who are directly exposed to a disaster and sustain greater losses from that disaster (a larger "dose") suffer more, compared with individuals who experience less direct impacts (a smaller "dose"). For example, results from the previously mentioned study of 725 California residents following the 2018 Camp Fire showed that individuals with more direct exposure to the fire were more likely to experience post-traumatic stress, depression, and anxiety symptoms.[173] Additionally, a meta-analysis of 31 studies examining mental health outcomes in adults and children following various types of natural disasters (hurricanes, tsunamis, floods, and earthquakes) revealed that individuals who suffered the loss of a loved one, were injured, or experienced fear or trauma during a disaster were more likely to experience post-disaster depression.[174] Two studies

[171] U.S. Environmental Protection Agency. (2020). *Understanding the connections between climate change and human health*.
[172] Abramson, D. M. et al. (2015). *The Hurricane Sandy person report: Disaster exposure, health impacts, economic burden, and social well-being*.
[173] Silveira, S. et al. (2021). Chronic mental health sequelae of climate change extremes: A case study of the deadliest Californian wildfire.
[174] Tang, B., Liu, X., Liu, Y., Xue, C., & Zhang, L. (2014). A meta-analysis of risk factors for depression in adults and children after natural disasters. *BMC public health*, *14*(1), 1-12.

examining the psychological effects of wildfires on children found a similar dose effect, with higher exposure to wildfires associated with higher levels of PTSD symptoms.[175,176] The risk of exposure is also related to a host of geographic factors.[177] For example, communities located in low-lying areas are more at risk for climate impacts related to rising seas; communities located in hot, dry, and densely wooded areas are more at risk for wildfires.

Personal Characteristics

Age

Various studies have shown that younger age is associated with a higher risk of psychological distress and/or more severe symptoms following climate-related disasters. For example, in the previously mentioned study of California residents (average age = 27; age range 18-84 years) following the 2018 Camp Fire, younger age was associated with higher levels of post-traumatic stress, depression, and anxiety.[178] This age effect seems to hold true within samples of children and adolescents, as well. For example, a study of young people ages 8-18 years following a wildfire in Australia found that younger age was associated with greater post-traumatic stress symptoms.[179] This age effect may be because coping and emotion regulation skills are still nascent and developing in children and adolescents.[180] Elderly people are also considered more vulnerable to climate change impacts,[181] though they are not the focus of this report.

Pre-existing Mental, Developmental, or Physical Health Conditions or Disabilities

An estimated 12.8% of US youth have special health-care needs, defined by the U.S. Maternal and Child Health Bureau as “those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally.”[182] Individuals with chronic mental, developmental, or physical health conditions or disabilities are often more vulnerable to the stress of climate change disasters.[183]

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[175] Yelland, C., Robinson, P., Lock, C., La Greca, A. M., Kokegei, B., Ridgway, V., & Lai, B. (2010). Bushfire impact on youth. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *23*(2), 274-277.

[176] McDermott, B. M., & Palmer, L. J. (2002). Postdisaster emotional distress, depression and event-related variables: findings across child and adolescent developmental stages. *Australian & New Zealand Journal of Psychiatry*, *36*(6), 754-761.

[177] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

[178] Silveira, S. et al. (2021). Chronic mental health sequelae of climate change extremes: A case study of the deadliest Californian wildfire.

[179] Yelland, C. et al. (2010). Bushfire impact on youth.

[180] Majeed, H., & Lee, J. (2017). The impact of climate change on youth depression and mental health. *The Lancet Planetary Health*, *1*(3), e94-e95.

[181] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

[182] McPherson, M., Arango, P., Fox, H., Lauver, C., McManus, M., Newacheck, P. W., Perrin, J. M., Shonkoff, J. P., & Strickland, B. (1998). A new definition of children with special health care needs. *Pediatrics*, *102*(1), 137–139, quote from p. 138.

[183] Rath, B., Donato, J., Duggan, A., Perrin, K., Bronfin, D. R., Ratard, R., VanDyke, R., & Magnus, M. (2007). Adverse health outcomes after Hurricane Katrina among children and adolescents with chronic conditions. *Journal of Health Care for the Poor and Underserved, 18*(2), 405–417.

People with chronic health conditions often depend on medical specialists and treatment regimens, diets, and other interventions. Disruptions in housing and regular routines can create more challenges than arise for people without chronic conditions.[184] Children and youth who depend on adult caregivers, especially children with special needs, may be especially sensitive to the adverse effects of evacuation and disruption of support systems and routines. Children and adolescents with special needs experienced increased morbidity and mortality due to Hurricane Andrew, which interrupted access to medical care and medications.[185]

Additionally, people with pre-existing mental illness can experience heightened symptoms in response to climate-related stressors and impacts on infrastructure can impede individuals from receiving the psychiatric care they need. It has been suggested that stressors caused by climate change can expose pre-existing psychological vulnerabilities, triggering the onset of psychopathology, and that young people with pre-existing mental health conditions can experience exacerbated symptoms due to climate events.[186] For example, a recent *New York Times* article described the case of a woman, Jess Mercer, whose parents lost their home and narrowly escaped with their lives during the 2018 Camp Fire. Jess had been formerly diagnosed with post-traumatic stress disorder, primarily due to living with a schizophrenic brother. After the fire, her PTSD symptoms were significantly heightened; she has been hospitalized for two panic attacks, the first on the one-year anniversary of the fire.[187]

Mental illness can also make individuals more vulnerable to physical impacts of climate change, such as heat-related death. Following a 2012 heatwave in Wisconsin, 52% of all heat-related deaths were among individuals with at least one diagnosed mental illness. The vulnerability to heat in those with a mental health disorder may have been due to deficits in self-care, social isolation, and/or to the use of psychotropic medications. Half of the individuals with mental illness who died were taking psychotropic medications, which affect the body's ability to thermoregulate.[188] As young people are increasingly prescribed psychotropic medications, special attention should be paid to their potentially reduced cooling capacity, particularly in the context of warming temperatures, more frequent heat waves, and wildfires.[189,190] Medications that treat mental illness are one of the main underlying causes of heat-related deaths.[191]

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[184] Gignac, M. A. M., Cott, C. A., & Badley, E. M. (2003). Living with a chronic disabling illness and then some: Data from the 1998 ice storm. *Canadian Journal on Aging/La Revue Canadienne Du Vieillissement*, *22*(3), 249–259.
[185] La Greca, A. M., Silverman, W. K., & Wasserstein, S. B. (1998). Children's predisaster functioning as a predictor of posttraumatic stress following Hurricane Andrew. *Journal of Consulting and Clinical Psychology*, *66*(6), 883–892.
[186] Majeed, H., & Lee, J. (2017). The impact of climate change on youth depression and mental health.
[187] Stanley, A. (2021, October 27). *The coming age of climate trauma*. Washington Post.
[188] Christenson, M. L., Geiger, S. D., & Anderson, H. A. (2013). Heat-related fatalities in Wisconsin during the summer of 2012. *WMJ*, *112*(5), 219-223.
[189] Westaway, K., Frank, O., Husband, A., McClure, A., Shute, R., Edwards, S., Curtis, J., & Rowett, D. (2015). Medicines can affect thermoregulation and accentuate the risk of dehydration and heat-related illness during hot weather. *Journal of Clinical Pharmacy and Therapeutics*, *40*(4), 363–367.
[190] Van Nieuwenhuizen, A. et al. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations.
[191] Dodgen, D., Donato, D., Kelly, N., La Greca, A., Morganstein, J., Reser, J., Ruzek, J., Schweitzer, S., Shimamoto, M. M., Tart, K. T., & Ursano, R. (2016). *Ch. 8: Mental health and well-being. The impacts of climate change on human*

Research on the mental health impacts of climate change on youth with disabilities is limited, but existing research suggests that youth with disabilities may be particularly vulnerable to the stress of climate-related disasters. For example, individuals with Autism Spectrum Disorder (ASD) are prone to traumatic stress, have a lower capacity for coping with stressful events, and tend to ruminate over a traumatic event after exposure.[192,193] Studies on the psychological impacts of disasters on youth living with disabilities exhibit reductions in adaptive daily functioning (e.g., communication, personal care, socialization, and motor skills);[194] sadness, tearfulness, withdrawal, and behavior changes;[195,196] and increased aggression.[197]

One study examined the psychological effects of 2017 Northern California wildfires on 14 children and youth (ages 3-20) with developmental disabilities (including but not limited to ASD, speech and language impairments, and Attention-deficit/hyperactivity disorder), based on in-depth interviews with their parents.[198] Findings indicated that the children and youth in this study exhibited many of the same emotional reactions as children without disabilities, such as stress, crying, and grief. However, children and adolescents in this study also exhibited a range of emotional and behavioral responses that may be unique to individuals with disabilities, such as an exacerbation of self-injurious and repetitive behaviors (e.g., head banging, nervous tics, rumination). Children with developmental disabilities are often strongly tied to a need for routine, and the severe disruptions in normal routines and settings due to the wildfire triggered intense emotional and behavioral reactions in the children and youth. Many children in this study had verbal impairments, and thus exhibited their distress non-verbally through behavioral reactions, illustrating the need to assess behavioral reactions in some youth and adults with disabilities.[199]

Additionally, nearly all of the families in the study had been forced to evacuate their home due to the fire, and factors related to the child's disability complicated evacuation efforts, such as having to navigate disability-related equipment (e.g., wheelchairs) and having to find wheelchair

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health in the United States: A scientific assessment. U.S. Global Change Research Program, Washington, DC, 217–246.

[192] Kerns, C. M., Newschaffer, C. J., Berkowitz, S., & Lee, B. K. (2017). Brief report: Examining the association of autism and adverse childhood experiences in the National Survey of Children's Health: The important role of income and co-occurring mental health conditions. *Journal of Autism and Developmental Disorders, 47*(7), 2275–2281.

[193] Stack, A., & Lucyshyn, J. (2019). Autism spectrum disorder and the experience of traumatic events: Review of the current literature to inform modifications to a treatment model for children with autism. *Journal of Autism and Developmental Disorders, 49*(4), 1613–1625.

[194] Valenti, M., Ciprietti, T., Egidio, C. D., Gabrielli, M., Masedu, F., Tomassini, A. R., & Sorge, G. (2012). Adaptive response of children and adolescents with autism to the 2009 earthquake in L'Aquila, Italy. *Journal of Autism and Developmental Disorders*, *42*(6), 954–960.

[195] Rath, B. et al. (2007). Adverse health outcomes after Hurricane Katrina among children and adolescents with chronic conditions.

[196] Ducy, E. M., & Stough, L. M. (2011). Exploring the support role of special education teachers after Hurricane Ike: Children with significant disabilities. *Journal of Family Issues, 32*(10), 1325–1345.

[197] Durkin, M. S., Khan, N., Davidson, L. L., Zaman, S. S., & Stein, Z. A. (1993). The effects of a natural disaster on child behavior: Evidence for posttraumatic stress. *American Journal of Public Health, 83*(11), 1549–1553.

[198] Ducy, E. M., & Stough, L. M. (2021). Psychological effects of the 2017 California wildfires on children and youth with disabilities. *Research in developmental disabilities*, *114*, 103981.

[199] Ibid.

accessible hotels, factors which only compounded the stress of the evacuation. Parents reported leaving behind important disability-related items in the evacuation, such as medications and sensory support equipment, which added additional stress and difficulty to the evacuation experience.[200]

Prior Trauma

Climate change poses additional risks for youth with prior trauma. A meta-analysis of 31 studies examining risk factors for depression in adults and children following natural disasters found that prior trauma was associated with post-disaster depression in both adults and children.[201] Additionally, in the Camp Fire study mentioned above, California residents with prior childhood trauma (i.e., child abuse and neglect) experienced higher levels of all three mental health outcomes measured (post-traumatic stress, depression, and anxiety) in response to the wildfire.[202] These findings are in line with an ample body of research suggesting that adverse childhood experiences are a robust risk factor for the onset of psychopathology in adolescents and adults.[203,204]

Female Gender

Different socially and culturally defined gender roles result in different responsibilities, resource use, and health needs,[205] and thus it is likely that an individual's gender may influence their vulnerability to climate hazards, with implications for mental health. Because women tend to have less socioeconomic power than men and are more likely to fill the role of primary caregivers and food providers for families and children, they may be more vulnerable to extreme weather events.[206] For example, 83% of low-income, single mothers did not return to their homes in New Orleans after Hurricane Katrina.[207] Additionally, there is growing evidence suggesting an association between climate change and gender-based violence, such as sexual assault and domestic abuse.[208] Physiological vulnerabilities during pregnancy and post-partum can also lead to greater sensitivity to climate-related impacts; for example, air pollution is considered a leading threat to pregnant women and their babies.[209]

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[200] Ibid.
[201] Tang, B. et al. (2014). A meta-analysis of risk factors for depression in adults and children after natural disasters.
[202] Silveira, S. et al. (2021). Chronic mental health sequelae of climate change extremes: A case study of the deadliest Californian wildfire.
[203] Cohen, P., Brown, J., & Smaile, E. (2001). Child abuse and neglect and the development of mental disorders in the general population. *Development and Psychopathology, 13*(4), 981–999.
[204] Green, J. G., McLaughlin, K. A., Berglund, P. A., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2010). Childhood adversities and adult psychiatric disorders in the national comorbidity survey replication I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry*, *67*(2), 113.
[205] World Health Organization. (2014). *Gender, climate change and health*.
[206] Ballew, M. et al. (2020, Apr 16). Which racial/ethnic groups care most about climate change?
[207] Rojas-Cheatham, A., Paredes, D. G., Griffin, S., Shah, A., & Shen, E. (2009). *Looking both ways: Women's lives at the crossroads of reproductive justice and climate justice*. The Momentum Series, Vol. 5. Expanding the Movement for Empowerment and Reproductive Justice.
[208] Whittenbury, K. (2013). Chapter 15: Climate change, women's health, wellbeing and experiences of gender based violence in Australia. In Alston, M., & Whittenbury, K. (Eds.). (2013). *Research, action and policy: Addressing the gendered impacts of climate change* (pp. 207-221). Springer Netherlands.
[209] Perera, F. (2018). Pollution from fossil-fuel combustion is the leading environmental threat to global pediatric health and equity: Solutions exist. *International journal of environmental research and public health*, *15*(1), 16.

Research on gender differences in climate-related mental health impacts is limited; however, existing research generally supports the presence of gender differences. A synthesis of the literature examining the effects of extreme weather events on youth mood and behavior found that female gender was a risk factor for post-traumatic stress, depressive symptoms, and negative externalizing behaviors (e.g., aggression, delinquency) in most (but not all) studies across different types of extreme weather events.[210] Women who are pregnant or postnatal, or supporting a child, seem to be particularly at risk for mental health detriments following climate change disasters.[211,212]

Additionally, while many surveys on climate change perceptions and emotions do not disaggregate data by gender, some survey research has shown that a higher proportion of women worry about global warming, and believe that global warming will harm them personally, will harm people in the U.S., plants and animals, and future generations.[213]

There is a lack of research on climate change health effects for non-binary people, who may also be particularly vulnerable to the mental health impacts of climate change as a result of compounding discrimination.[214]

Social and Economic Factors

Disadvantaged Communities

Environmental injustice, the disproportionate exposure of communities of color and the poor to pollution and environmental risks, is a pervasive reality in American society.[215] Low-income communities are often more exposed to climate impacts (e.g., disasters, pollution, heatwaves) and have fewer economic and political resources to buffer these impacts.[216] This greater exposure to pollution and climate impacts, compounded by pre-existing stressors such as poverty, racism, and racial violence, can lead to a significantly higher risk for psychological distress and psychopathology.

The greater exposure to climate impacts is due to many factors, including city planning and infrastructure issues. For example, during the record-shattering “heat dome” in Portland in June of 2021, temperatures in low-income areas were a staggering 124 degrees Fahrenheit, while temperatures in more affluent neighborhoods held at 99 degrees — a full 25-degree difference.

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[210] Barkin, J. L., Buoli, M., Curry, C. L., von Esenwein, S. A., Upadhyay, S., Kearney, M. B., & Mach, K. (2021). Effects of extreme weather events on child mood and behavior. *Developmental Medicine & Child Neurology*, *63*(7), 785-790.
[211] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[212] Abramson, D. M., & Garfield, R. M. (2006). On the edge: Children and families displaced by Hurricanes Katrina and Rita face a looming medical and mental health crisis.
[213] Ballew, M. et al. (2018). *Gender differences in public understanding of climate change*.
[214] van Daalen, K., Jung, L., Dhatt, R., & Phelan, A. L. (2020). Climate change and gender-based health disparities. *The Lancet Planetary Health*, *4*(2), e44-e45.
[215] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[216] Ibid.

This phenomenon, called “urban heat islands”, are created by deficits in green space, proximity to freeways, an abundance of asphalt, and residential high-rises crowded together.[217]

Climate disasters can exact a tremendous financial toll on individuals, households, and communities. Households that were already under financial strain before a climate event are far less resilient to the financial blows a climate disaster can bring, leading to stress and psychological impacts. For example, in the wake of Hurricane Sandy, the costs of recovery were substantial, and 13% of households lost income, a business, or a job. Low-income residents exhibited the highest levels of severe psychological distress, depression, and anxiety after the hurricane.[218]

For many communities of color, climate change is not the first or the primary existential threat they face. Many communities of color have been facing an existential crisis long before the impacts of climate change began to be widely felt. For example, for Black and Indigenous communities, intergenerational trauma, systematic racism, and racial violence have given individuals a fundamental sense that their basic existence is neither assured nor protected (J. Sasser, personal communication, October 19, 2021). When the stressors related to climate change — pollution, floods, fires, and storms, and the threat of more to come — are layered on top of these pre-existing threats, mental health can be significantly impacted.

Indigenous Communities

Members of Indigenous communities, for whom the natural world plays a central role in their sense of identity, meaning, and spirituality, can suffer greater impacts when their connections to the natural world are disrupted or the land is lost or degraded due to climate impacts.[219] For Indigenous communities, climate change can threaten not only their physical home but also their cultural heritage, such as their access to traditional food and culturally meaningful practices. Indigenous communities are often defined by a special connection to the natural environment; when environments are degraded due to climate change, this can threaten their fundamental sense of identity.[220]

Studies of the relationship between climate change and mental health in Inuit communities have found wide-ranging impacts, including strong emotional reactions, weakening social networks, increased levels of conflict, increased drug and alcohol usage, and significant stress association with relocation or anticipated relocation.[221,222]

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[217] Gardner, J. R. (2021, October 11). *Seventy-two hours under the heat dome*. The New Yorker.
[218] Abramson, D. M. et al. (2015). *The Hurricane Sandy person report: Disaster exposure, health impacts, economic burden, and social well-being*.
[219] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[220] Ibid.
[221] Cunsolo Willox, A., Harper, S. L., Ford, J. D., Edge, V. L., Landman, K., Houle, K., Blake, S., & Wolfrey, C. (2013). Climate change and mental health: An exploratory case study from Rigolet, Nunatsiavut, Canada. *Climatic Change*, *121*(2), 255–270.
[222] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.

Individuals or Families with Land-Based Livelihoods

Individuals whose livelihoods are directly connected to the natural environment, through agriculture, fishing, or tourism, are at greater risk for climate change impacts and mental health detriments.[223] In California, considered the "breadbasket" of the United States, a large number of households depend on agriculture for their income and sustenance. When agricultural land is diminished by wildfires or drought, this can be a major source of stress and grief, anxiety, and depression.[224] Given that 92% of farmworkers identify as Hispanic/Latino, these communities are disproportionately impacted.[225] Although peer-reviewed studies have not yet been conducted in California agricultural communities specifically, studies of farmers in Australia who have been negatively affected by chronic drought suggest significant mental health impacts.[226]

Climate Professionals

It should also be noted that much of the early work recognizing climate distress came out of the experience of climate activists, advocates, and scientists, who, due to the nature of their work, must grapple with the threatening realities of climate change and humanity's failure to adequately address it on a daily basis.[227] Professionals working in these fields (e.g., young people working for environmental or climate justice groups) often experience intense distress and burnout, depression, and anxiety, and many of the mental health practitioners who have led the way in this field began their journey by offering tools and support to patients in this group. As the climate crisis has become more widely felt, the need for therapeutic support has become more widespread (L. Davenport, personal communication, Sept 23, 2021).

Social Isolation, Lack of Social Support

Individuals who live alone, are socially isolated, or experience low levels of social support are more vulnerable to climate change. In a study of a heatwave in Wisconsin in 2012, 56% of fatalities were people who lived alone.[228] In the 2021 heatwave in Oregon, nearly every victim of the heatwave died alone; this was likely due to the confusion caused by intense heat, which made isolated people unaware that they needed help and/or unable to seek help.[229] Low social support has also been shown to exacerbate post-disaster mental health outcomes. For example, displaced individuals with low social support had higher depressive symptoms following Hurricane Katrina, compared to displaced individuals with more social support.[230]

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[223] Ibid.
[224] Wozniacka, G. (2021, October 5). *Climate anxiety takes a growing toll on farmers*. Civil Eats.
[225] California Research Bureau, California State Library. (2013). *Farmworkers in California: A brief introduction* (S-13-017).
[226] Hanigan, I. C., Butler, C. D., Kokic, P. N., & Hutchinson, M. F. (2012). Suicide and drought in new South Wales, Australia, 1970–2007. *Proceedings of the National Academy of Sciences*, *109*(35), 13950-13955.
[227] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.
[228] Christenson, M. L. et al. (2013). Heat-related fatalities in Wisconsin during the summer of 2012.
[229] Kaplan, S. (2021, July 21). *Heat waves are dangerous. Isolation and inequality make them deadly*. Washington Post.
[230] McGuire, A. P., Gauthier, J. M., Anderson, L. M., Hollingsworth, D. W., Tracy, M., Galea, S., & Coffey, S. F. (2018). Social support moderates effects of natural disaster exposure on depression and posttraumatic stress disorder symptoms: Effects for displaced and nondisplaced residents. *Journal of Traumatic Stress*, *31*(2), 223-233.

Intervention Components and Approaches

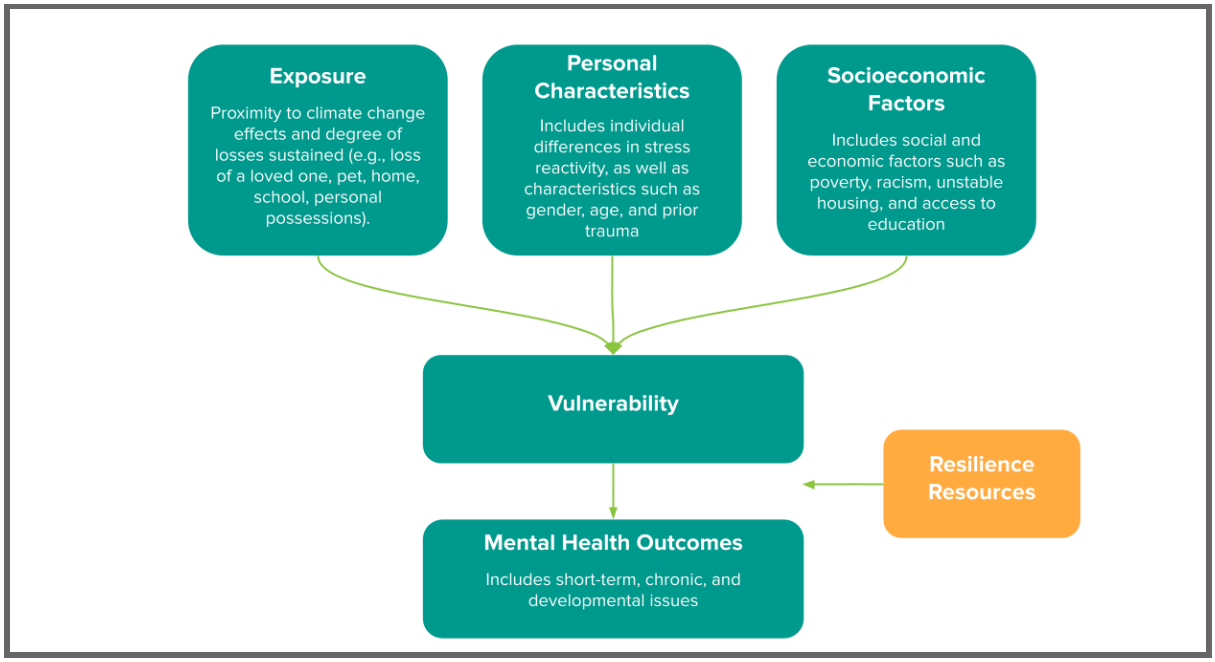
The mental health impacts of climate change are projected to continue to rise, and will disproportionately affect young people and disadvantaged groups.[231] What can be done to support vulnerable individuals and communities, and in particular youth and young people of color? What resources exist to help support people experiencing climate distress, minimize impairments in functioning, and promote the development of emotional resilience in the face of accelerating climate threats (Figure 8)?

In this section of the report, we will attempt to respond to these questions. First, we begin with a brief overview of the state of intervention research, a discussion of the goals of interventions for climate anxiety, and encourage the use of appropriate terminology. Next, we will focus on the content of climate anxiety interventions. We propose that there are seven core components or strategies that are common across many approaches and interventions, and which seem to hold promise for effectively supporting youth struggling with climate distress. Recognition of climate anxiety is relatively new, yet community-based and online resources are plentiful and all over the map. Clinical resources and intervention strategies are nascent and emerging, and only two (at the time of writing) have been empirically evaluated to determine their efficacy for climate anxiety specifically. However, some tools and resources have been demonstrated as highly effective in helping individuals cope with related issues such as trauma, grief, anxiety, and depression, and climate-aware therapists often draw on these strategies to support patients struggling with climate anxiety. The proposed framework identifies the central tools and strategies used by clinicians and empirically supported for dealing with difficult emotions; these are our proposed “core components”. Effective interventions will likely involve a number of these components, if not all. This framework can be used as a kind of litmus test for evaluating existing tools and interventions until more research empirically testing specific intervention strategies for climate anxiety emerges. Special consideration is given to BIPOC and historically marginalized groups in the discussion of these core strategies, when relevant.

Finally, we turn to existing resources and interventions. We highlight and describe the resources that we consider to be the strongest, because they utilize a maximum number of our identified core strategies, and are appropriate and accessible for diverse youth in California. We identify resources available in clinical settings, as well as community, education, and media resources.

[231] Gamble, J. L., Balbus, J., Berger, M., Bouye, K., Campbell, V., Chief, K., Conlon, K., Crimmins, A., Flanagan, B., Gonzalez-Maddux, C., Hallisey, E., Hutchins, S., Jantarasami, L., Khoury, S., Kiefer, M., Kolling, J., Lynn, K., Manangan, A., McDonald, M., Morello-Frosch, R., Redsteer, M. H., Sheffield, P., Thigpen Tart, K., Watson, J., Whyte, K. P., & Wolkin, A .F. (2016). *Ch. 9: Populations of concern. The impacts of climate change on human health in the United States: A scientific assessment*. U.S. Global Change Research Program.

Figure 8. Resilience resources buffer the relationship between vulnerability and mental health outcomes



Adapted from U.S. Environmental Protection Agency (2020)[232]

A Note about Terminology

As discussed in earlier sections of this paper, climate distress is not a pathological condition, but a natural response to a real existential threat.[233,234,235,236] Thus, the language around interventions for climate anxiety cannot be borrowed from the language used when discussing treatment for pathological conditions (including the term "treatment" itself). Instead, in this report, we will use terms such as "intervention", "resilience strategies" and "support strategies", rather than "treatment."

However, for some individuals, particularly those who are most vulnerable due to higher exposure and pre-existing stressors, the emotional impacts of climate change can cause stress that can lead to psychopathology. In these cases, when distress reaches clinically significant levels and begins to meaningfully impair an individual's ability to function, terms like "treatment" may be appropriate.

[232] U.S. Environmental Protection Agency. (2020). *Understanding the connections between climate change and human health*.
[233] Clayton, S. (2020). Climate anxiety: Psychological responses to climate change.
[234] Ojala, M., Cunsolo, A., Ogunbode, C. A., & Middleton, J. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review. *Annual Review of Environment and Resources*, *46*, 35-58.
[235] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[236] Ibid.

Although terms like “climate anxiety” and “eco-grief” may become more common with continued climate-related crises and extreme weather events,[237] they may not resonate with or be used by BIPOC individuals, according to Jacqueline Patterson, Founder of The Chisholm Legacy Project and former Senior Director of Climate Justice for the National Association for the Advancement of Colored People (J. Patterson, personal communication, October 19, 2021). Using terms that do not resonate with the BIPOC community may deter these individuals from joining support networks that use these terms. This hypothesis is supported by the well-documented distrust and under-utilization of healthcare services among these populations coupled with a history of stigma associated with mental illness in Black and Latinx adolescents[238,239,240] and adults, for example.[241,242] Research can identify terminology that appeals to certain groups and utilize tailored terminology when interacting with such groups to increase engagement.

Intervention Research is Limited

Research on therapeutic interventions to address the impact of climate change on mental health and wellbeing is still emerging. Although the range of support groups, books, and other resources for individuals struggling with climate emotions is quickly growing, few empirically tested climate mental health interventions exist. Most existing research has focused on investigating the relationship between climate change and mental health outcomes, uncovering the extent to which population subgroups are impacted by climate change and subsequent needs, and proposing strategies for addressing these problems.[243,244,245] A recent review of published clinical interventions concluded that only two existing interventions have been evaluated for efficacy.[246] Existing interventions often draw on therapeutic strategies used for coping with trauma and major stressors, as well as resilience-building techniques; future work should confirm that such strategies are effective for individuals coping with climate distress specifically. Additionally, there is a need for work identifying the specific needs of BIPOC and other vulnerable populations, and designing and testing interventions in these groups.

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[237] To, P., Eboreime, E., & Agyapong, V. I. (2021). The impact of wildfires on mental health: A scoping review. *Behavioral Sciences*, *11*(9), 126.
[238] Alegria, M., Vallas, M., & Pumariega, A. J. (2010). Racial and ethnic disparities in pediatric mental health. *Child and Adolescent Psychiatric Clinics*, *19*(4), 759-774.
[239] DuPont-Reyes, M. J., Villatoro, A. P., Phelan, J. C., Painter, K., & Link, B. G. (2020). Adolescent views of mental illness stigma: An intersectional lens. *American Journal of Orthopsychiatry*, *90*(2), 201.
[240] Fante-Coleman, T., & Jackson-Best, F. (2020). Barriers and facilitators to accessing mental healthcare in Canada for black youth: A scoping review. *Adolescent Research Review*, *5*(2), 115-136.
[241] Eylem, O., De Wit, L., Van Straten, A., Steubl, L., Melissourgaki, Z., Danışman, G. T., de Vries, R., Kerkhof, A. J. F. M., Bhui, K., & Cuijpers, P. (2020). Stigma for common mental disorders in racial minorities and majorities a systematic review and meta-analysis. *BMC Public Health*, *20*, 1-20.
[242] Ballew, M. et al. (2020, Apr 16). Which racial/ethnic groups care most about climate change?
[243] Coffey, Y., Bhullar, N., Durkin, J., Islam, M. S., & Usher, K. (2021). Understanding eco-anxiety: A systematic scoping review of current literature and identified knowledge gaps. *The Journal of Climate Change and Health*, *3.*
[244] Patel, S. S., Robb, K., Pluff, C., Maldonado, E., Tatar, G., & Williams, T. (2021). Elevating mental health disparities and building psychosocial resilience among BIPOC children and youth to broaden the climate and health discourse. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, *12*(1).
[245] Gamble, J. L. et al. (2016). *Ch. 9: Populations of concern. The impacts of climate change on human health in the United States: A scientific assessment*.
[246] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety. *International Journal of Environmental Research and Public Health*, *18*(18).

While more diverse populations and rigorous study designs are needed to test the efficacy of interventions, a recent study provided individual and community-level insights on intervention strategies applicable for use by clinicians, communicators, and policy advocates.[247] Informed by literature from public health, communication, and resilience, exemplary strategies included: utilizing credible sources (e.g., mental health practitioner), partnering with communities to facilitate trust, using local "messengers", engaging in bi-directional communication that is sensitive to the cultural context, ensuring messaging sensitivity to variability in both the stressor and stress response, considering the numerous ways that climate change can be stress-inducing and elicit diverse coping responses/strategies, and tailor messages.[248] For clinicians, in particular, consideration of adaptable solutions for acute and chronic stressors and the provision of tools to fit the differing needs of affected populations was recommended.[249]

Emotional Resilience is the Goal

Worrying about climate change can act as a "motivational force" that drives people to take action.[250] As anxiety researcher David Barlow pointed out, "Without anxiety, little would be accomplished."[251] The capacity of anxiety to incite action has also been articulated by climate activist and youth leader Greta Thunberg: *"*I want you to panic. I want you to feel the fear I feel every day. And then I want you to act. I want you to act as you would in a crisis. I want you to act as if our house is on fire. Because it is.*"* [252] The motivational capacity of negative emotions is supported by research; a recent literature review found that negative affect and emotions related to climate change were consistently among the strongest predictors of engagement in climate change mitigation behaviors and climate policy support.[253] Negative emotions about climate change seem to motivate individuals to take action — action which is desperately needed on a broad, global scale. Given the strong constructive nature of these emotions, experts in the field have suggested that the goal of interventions should not necessarily be to eliminate negative emotions.[254] Instead, interventions can focus on facilitating the expression, processing, and validating of young people's climate concerns, as well as promoting positive emotions, reducing stress and functional impairment (e.g., how much negative emotions interfere with one's ability to work, sleep, eat, maintain healthy relationships, etc.), and cultivating resilience.[255,256]

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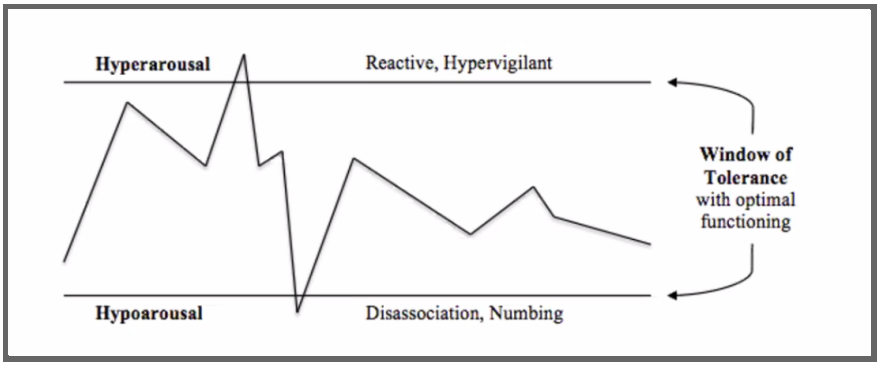
[247] Mah, A. Y., Chapman, D. A., Markowitz, E. M., & Lickel, B. (2020). Coping with climate change: Three insights for research, intervention, and communication to promote adaptive coping to climate change. *Journal of Anxiety Disorders*, *75*.
[248] Ibid.
[249] Ibid.
[250] Ojala, M. et al. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review, p. 45.
[251] Barlow, D.H. (2004). *Anxiety and its disorders: The nature and treatment of anxiety and panic* (2nd ed., p. 9). Guilford Press.
[252] Winter, J. (2019). *Our house is on fire: Greta Thunberg's call to save the planet*. Simon and Schuster.
[253] Brosch, T. (2021). Affect and emotions as drivers of climate change perception and action: A review.
[254] Ojala, M. et al. (2021). Anxiety, worry, and grief in a time of environmental and climate crisis: A narrative review.
[255] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[256] Patel, S. S. et al. (2021). Elevating mental health disparities and building psychosocial resilience among BIPOC children and youth to broaden the climate and health discourse.

Indeed, there has been a call to prioritize and build psychosocial resilience among children and youth, as well as other groups experiencing the disproportionately negative effects of crises influenced by environmental injustices.[257] The concept of resilience has been defined as "experiencing stressors and consequently negative emotional responses, but adapting to such adversity with an absence of psychiatric conditions that by definition are functionally impairing."[258] Thus, resiliency is not an absence of negative emotions, but the ability to experience negative emotions without having them "stick" and cause more chronic or intractable mental health issues. As climate psychology educator, consultant, and psychotherapist Leslie Davenport has put it, "Healthy feelings are ones that flow."[259]

According to Davenport, a primary goal of climate anxiety intervention work is to expand a person's "zone of resilience", sometimes referred to as a "window of tolerance" (Figure 9). "Zone of resilience is a term used to describe the zone of attention in which a person can function most effectively. When people are within this zone, they are typically able to readily receive, process, and integrate information and otherwise respond to the demands of everyday life without much difficulty."[260] When people are pushed outside of this zone of resilience — by being overwhelmed by the impacts of a climate disaster on their life, for example, or even by reading a particularly dire news article about the crisis — they may either "lash out" (become angry and upset) or "numb out" (become disengaged and avoidant). The goal of intervention work, then, is to expand this zone of resilience to be able to tolerate and exist with more. As Dr. Caroline Hickman had said (summarized by Britt Wray), "We need to not only *grow up* in the climate crisis by cultivating our imaginative, creative, determined and hopeful capacities, we also need to *grow down* by building our tolerance for guilt, shame, anxiety, and depression."[261]

Figure 9. Zone of resilience



From Davenport, L. (2021)[262]

[257] Ibid.
[258] Friedberg, A., & Malefakis, D. (2018). Resilience, trauma, and coping. *Psychodynamic Psychiatry*, *46*(1), 81-113.
[259] Davenport, L. (2021, October 26). *Facing climate change with emotional strength*. Alameda County Library program, Alameda County.
[260] Ibid.
[261] Wray, B. (2020, August 5). *Why activism isn't *really* the cure for eco-anxiety and eco-grief.* Gen Dread, Substack.
[262] Leslie Davenport. (2021, October 26). *Facing climate change with emotional strength*.

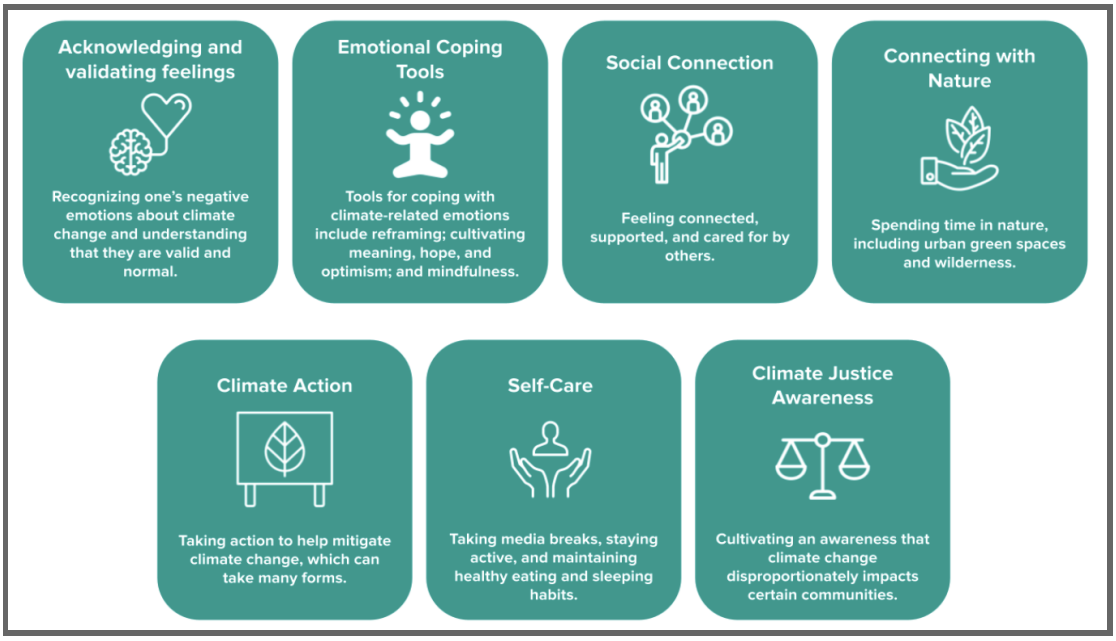
Intervention Content: Core Components

The range of resources for individuals struggling with climate anxiety has swelled in just the past few years. These resources have been developed not just by researchers and clinicians, but also by educators, community leaders, and even artists. Given that the effectiveness of these resources for coping with climate emotions remains largely untested, how can we sift through this pool of resources and identify the most promising ones?

Even though research hasn't yet identified what works best for climate anxiety specifically, what *is* known is what tends to be effective for coping with stress and trauma and difficult emotions generally — and a fair number of existing resources harness these strategies. Thus, we consider the best-informed resources to be those that draw upon strategies and techniques empirically demonstrated as effective for dealing with stress and trauma and/or promoting emotional resilience generally.

From a synthesis of existing literature, insights from subject matter experts, and a review of existing resources, we have identified a number of "core components" that have the potential to promote emotional resilience in the face of climate anxiety, based on their efficacy for related constructs. The seven core components we identified were: (1) acknowledging and validating feelings, (2) emotional coping tools, (3) social connection, (4) connecting with nature, (5) climate action, (6) self-care, and (7) climate justice awareness (Figure 10). In this section of the report, we will describe each of these recommended core components and cite evidence supporting their efficacy. In the subsequent section, we will highlight existing interventions which utilize one or (often) more of these core components, across different populations and settings. Additionally, while other strategies for promoting emotional resilience in the face of climate change certainly exist, we chose the strategies that were the most commonly supported by experts and the empirical literature.

Figure 10. Core Components of Promising Interventions



Acknowledging and Validating Feelings

Young people feel that their concerns about climate change are often ignored, brushed off, and belittled, and that they have no one to talk to about their worries.[263,264] According to clinicians and researchers with expertise in climate anxiety, acknowledging and normalizing an individual's emotions is the best first step towards building emotional resilience in the face of climate change.[265,266] Providing a safe space for youth to express emotions is important for avoiding feelings of isolation and emotional bottlenecks. This may involve parents, caregivers, and educators initiating conversations with youth, or listening actively and openly when youth approach them with concerns.[267] The goal of such conversations should be to "make space" for recognizing and validating stressful feelings, without judgment, such that the individual feels heard and understood. Additionally, it can be beneficial to normalize the person's feelings by pointing out that their emotions are a natural response to a frightening situation, and that many people across the globe are experiencing similar emotional responses to this crisis.[268]

[263] Atherton, R. (2020). *Climate anxiety: Survey for BBC Newsround shows children losing sleep over climate change and the environment*.
[264] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[265] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.
[266] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[267] Davenport, L. (2021, October 26). *Facing climate change with emotional strength*.
[268] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.

Emotional Coping Tools

Many tools have been used by mental health practitioners to help patients cope with the emotional response to climate change, including but not limited to narrative therapy, cognitive behavioral therapy, creative expression/art therapy, and dream analysis.[269] Given that the efficacy of intervention strategies for climate anxiety/grief is at this time largely untested, we have chosen to focus on three tools below that were identified in expert interviews and the literature as potentially holding substantial promise: reframing; cultivating meaning, hope, and optimism; and mindfulness.

Reframing: From "Eco-Anxiety" to "Eco-Compassion"

As Caroline Hickman points out, individuals who feel distressed about the climate crisis are those who care about the planet, people, and other species. They experience grief in the face of environmental losses precisely because they are paying attention to what's going on in the world and because they value and care about the planet and its inhabitants. Thus, Hickman suggests reframing eco-anxiety as "eco-compassion", "eco-empathy", or "eco-caring". Doing so shifts the emphasis from a "pathologizing mental framework" to one that focuses on positive traits: connection, caring, and empathy. Hickman states:

> I have found in practice that these feelings change, are sometimes reduced, and can be experienced differently, valued and appreciated and even welcome when framed as eco-empathy. People have changed their relationship to their feelings saying they are relieved to be feeling this distress as it shows them that they care, that they are living a life connected emphatically with the planet, and that it offers some understanding of the struggles of the people living in countries that are facing the more immediate impacts of the climate crisis.[270]

Hickman suggests we move away from seeing emotions around climate change as problematic, and instead towards seeing such feelings as a "call for healing", emphasizing the fact that such emotions serve a practical role in motivating us to act.[271] Acting on such feelings can involve addressing and processing the emotions themselves (what psychologists call "emotion-focused coping") and/or taking action to mitigate the source of the emotions ("problem-focused coping").[272] As previously discussed, negative emotions about climate change can motivate individuals to engage in more pro-environmental behaviors and activism efforts.[273] Thus, negative emotions about climate change can be reframed as fodder for action, pointing out that climate distress is a functional and constructive response, signaling that something is wrong, drawing much-needed attention to the problem, and motivating us to do something about it.

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[269] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[270] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety, pp. 416-417.
[271] Ibid.
[272] Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
[273] Brosch, T. (2021). Affect and emotions as drivers of climate change perception and action: A review.

Cultivating Meaning, Hope, and Optimism

Research suggests that a coping strategy referred to by psychologists as "meaning-focused coping" may be particularly beneficial.[274] In the context of climate change, meaning-focused coping can involve finding meaning in the climate crisis, and cultivating positive emotions, such as realistic hope and optimism. These positive emotions can co-exist alongside negative emotions and help buffer their impact on well-being.[275,276] For example, an individual may find benefits in the climate crisis, such as recognizing that although the climate crisis has many negative impacts, it also has the potential to bring people together to create much-needed societal change. Additionally, cultivating a sense of realistic and grounded hope and optimism is a strategy used by many clinicians to help patients struggling with climate distress.[277] Research by Maria Ojala in children and adolescents found that meaning-focused coping strategies (in this case, feelings of hope and faith in humanity to tackle the problem) were associated with higher levels of environmental engagement, efficacy, life satisfaction, and positive affect, as well as lower levels of negative affect in children and adolescents.[278]

Mindfulness

Mindfulness, or the practice of staying in the present moment, is an approach commonly recommended by clinicians and experts for coping with climate anxiety (K. Hudson, personal communication, September 22, 2021).[279] Dr. Jon Kabat-Zinn, the founder of the Mindfulness-Based Stress Reduction program, defines mindfulness as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment."[280] Mindfulness is most often practiced as a meditation, and any effort to observe one's mind, body, and emotions in the present moment can be considered a mindful practice. Mindfulness interventions have been shown to improve stress management and coping skills,[281] which can be beneficial for people struggling with climate anxiety and grief. A substantial body of research exists demonstrating that mindfulness-based interventions lead to improvements in mental health, including anxiety, depression, and PTSD symptoms.[282] Mindfulness is also a common component of both Dialectical Behavior Therapy (DBT) and Acceptance and Commitment Therapy (ACT), two evidence-based therapies that hold promise for use with patients struggling with climate anxiety and grief (S. Schwartz, personal communication, August 24, 2021; K. Hudson, personal communication, September 22, 2021).

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[274] Park, C. L., & Folkman, S. (1997). Meaning in the context of stress and coping. *Review of General Psychology, 1*(2)*,* 115-144.
[275] Ibid.
[276] Ojala, M. (2012). Regulating worry, promoting hope: How do children, adolescents, and young adults cope with climate change? *International Journal of Environmental and Science Education*, *7*(4), 537-561.
[277] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[278] Ojala, M. (2012). How do children cope with global climate change? Coping strategies, engagement, and well-being. *Journal of Environmental Psychology, 32*(3), 225–233.
[279] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.
[280] Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, *10*(2), 144–156.
[281] Creswell, J. D. (2017). Mindfulness interventions. *Annual review of psychology*, *68*, 491-516.
[282] Ibid.

Social Connection

Social connectedness is a basic human psychological need.[283] Connecting with others, both physically and emotionally, can impact health and wellbeing and is a primary source of resilience.[284,285] Among youth, in particular, it is a major determinant of adjustment.[286] In comparison, social isolation (i.e., having few or infrequent contacts and limited networks)[287] has demonstrated detrimental effects on physical and mental health.[288]

Social support, the extent to which one feels cared for and supported informally (family, friends, peers) or formally (teachers, doctor, counselor) by those in one's network,[289] is a function of social connectedness.[290] A robust body of literature has shown that social support is profoundly protective in the face of stress, and is strongly linked with both physical and mental health and wellbeing.[291,292] Whether perceived or actual, social support has benefits. Perceived social support has been shown to predict fewer psychological symptoms;[293] whereas *actual* social support has been shown to buffer against physical and mental health outcomes and promote resilience during adversity.[294] A comprehensive review of studies on disaster outcomes found that higher levels of perceived social support were consistently associated with lower psychiatric symptoms.[295] For example, social support before and immediately after Hurricane Katrina was shown to predict lower levels of psychological distress, a benefit that was maintained even years after the exposure.[296] An analysis of National Oceanic and Atmospheric Administration's National Weather Service fatality data (1996-2018) due to heat- and cold-related hazards,

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[283] Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.
[284] Holt-Lunstad, J. (2020). *Social isolation and health*. Health Affairs Health Policy Brief.
[285] Clayton, S. (2020). Climate anxiety: Psychological responses to climate change.
[286] Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior.
[287] Holt-Lunstad, J. (2020). *Social isolation and health*.
[288] Leigh-Hunt, N., Bagguley, D., Bash, K., Turner, V., Turnbull, S., Valtorta, N., & Caan, W. (2017). An overview of systematic reviews on the public health consequences of social isolation and loneliness. *Public Health*, *152*, 157-171.
[289] Taylor, S. E. (2011). Social support: A review. In H. S. Friedman (Ed.), *The Oxford handbook of health psychology* (pp. 189–214). Oxford University Press.
[290] Lowe, S. R., Chan, C. S., & Rhodes, J. E. (2010). Pre-hurricane perceived social support protects against psychological distress: A longitudinal analysis of low-income mothers. *Journal of Consulting and Clinical Psychology*, *78*(4), 551.
[291] Holt-Lunstad, J. (2020). *Social isolation and health*.
[292] Leigh-Hunt, N. et al. (2017). An overview of systematic reviews on the public health consequences of social isolation and loneliness.
[293] Lowe, S. R. et al. (2010). Pre-hurricane perceived social support protects against psychological distress: A longitudinal analysis of low-income mothers.
[294] Nitschke, J. P., Forbes, P. A., Ali, N., Cutler, J., Apps, M. A., Lockwood, P. L., & Lamm, C. (2021). Resilience during uncertainty? Greater social connectedness during COVID‐19 lockdown is associated with reduced distress and fatigue. *British Journal of Health Psychology, 26*(2), 553-569.
[295] Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry: Interpersonal and Biological Processes*, *65*(3), 207-239.
[296] Chan, C. S., Lowe, S. R., Weber, E., & Rhodes, J. E. (2015). The contribution of pre- and post-disaster social support to short- and long-term mental health after Hurricanes Katrina: A longitudinal study of low-income survivors. *Social Science & Medicine, 138*, 38–43.

tropical cyclones, and wildfires found that youth and older adults experience greater vulnerabilities, but those receiving support from their network (family, neighbors, community) were more likely to avoid potentially fatal weather events, compared with socially isolated individuals.[297]

Social support is likely also crucial among individuals who have not yet been directly impacted by climate change; those struggling with negative emotions due to an awareness of climate change and its wide-ranging negative consequences. As previously discussed, research has shown that young people often report feeling that they have no one to talk to about their concerns, causing a sense of isolation.[298,299] As mentioned in the "Acknowledging and Validating Feelings" section above, experts have strongly suggested that parents and caregivers initiate conversations with youth about climate change and their emotional response to it.[300] Such conversations can be an important first step towards building a sense of social connection and support for youth. Additionally, involvement in group activism can be highly beneficial due in part to the social support aspect of such activities, as will be discussed below (see "Activism" section).

Finally, membership in a resilient family encourages individual resilience.[301] Working with parents to increase *their* agency, facilitating improved parent-child relationships, and providing them with social support[302] may support important familial processes, such as communication, individual and collective problem solving, etc., and in turn, build resilience and mobilize social support for children and youth.[303] For vulnerable youth, the audience, setting, and context (e.g., discrimination, trust) are top-of-mind considerations when aiming to foster social connectedness and social support.[304]

Connecting with Nature

It has been said that "our relationship with nature affords us to be fully flourishing human beings."[305] Indeed, research suggests that both nature exposure and nature connectedness have positive impacts on mental health and wellbeing. Nature exposure is defined as "direct

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[297] Garner, J. M., Iwasko, W. C., Jewel, T. D., Charboneau, B. R., Dodd, A. A., & Zontos, K. M. (2020). A multihazard assessment of age-related weather vulnerabilities. *Weather, Climate, and Society*, *12*(3), 367-386.
[298] Atherton, R. (2020). *Climate anxiety: Survey for BBC Newsround shows children losing sleep over climate change and the environment*.
[299] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[300] Davenport, L. (2021, October 26). *Facing climate change with emotional strength*.
[301] Walsh, F. (2011). Family resilience: A collaborative approach in response to stressful life challenges. *Resilience and Mental Health: Challenges Across the Lifespan*, *12*, 149-61.
[302] Bauer, A., Stevens, M., Purtscheller, D., Knapp, M., Fonagy, P., Evans-Lacko, S., & Paul, J. (2021). Mobilising social support to improve mental health for children and adolescents: A systematic review using principles of realist synthesis. *PLOS one*, *16*(5), e0251750.
[303] Ibid.
[304] Ibid.
[305] Passmore, H. A., & Howell, A. J. (2014). Eco-existential positive psychology: Experiences in nature, existential anxieties, and well-being. *The Humanistic Psychologist, 42*(4), 370-388.

physical and/or sensory contact with the natural environment" (Wood, et al., 2019, p. 1).[306] One study, which used a unique photovoice (photography and focus groups) methodology to explore the mental health impacts of climate among a sample of youth (ages 16 - 23), found that spending time in nature was the most frequently cited strategy for coping with climate distress; nature exposure in this sample was associated with "captivation, peace, harmony, hope, sense of calm, grounding, recharging, ease of worries and strengthened emotional connection" (Grant, 2021, p. 35).[307] In the words of one participant, "Seeing the Great Blue Heron reminds me that not all is lost and that I should enjoy my time in nature, rather than worrying whether it will last, focusing on just observing the things around while they're here" (Grant, 2021, p. 36).[308] Similarly, another study in a sample of adolescents found that time spent in nature resulted in self-reported improvements in both mental and physical health.[309] In a study of young adults, walking in nature for 90-minutes led to reductions in rumination (repetitive negative thoughts).[310]

One study, in a sample of predominantly African American, urban adolescents, examined the association between green space exposure and psychological stress in real-time.[311] The study utilized geolocation data (to assess time in green space) coupled with Geographic Ecological Momentary Assessment (GEMA), which involves repeated assessments of mood (to assess psychological stress). Results showed that time spent in urban greenspace was associated with lower levels of stress, in line with the known effects of nature on stress reduction. However, the benefits of nature on stress only held true when green space was away from home. The researchers speculated that "home" could be associated with family-related stressors not captured in the study.[312]

A concept related to nature exposure is nature connectedness, which is conceptualized as "the affective, cognitive, and experiential relationship individuals have with the natural world or a subjective sense of connectedness with nature" (Nisbet, et al., 2009, p. 715). [313] Nature connectedness has also been associated with improved psychological wellbeing, including lower levels of distress and positive moods.[314] In a review of interventions for the treatment of

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[306] Wood, C., Barron, D., & Smyth, N. (2019). The current and retrospective intentional nature exposure scales: Development and factorial validity. *International Journal of Environmental Research and Public Health, 16*(22), 4443.
[307] Grant, B. (2021). *Coping with the climate crisis: Investigating the mental health impacts of climate change on youth* [Bachelor's thesis].
[308] Ibid, p. 36.
[309] Tillmann, S., Tobin, D., Avison, W., & Gilliland, J. (2018). Mental health benefits of interactions with nature in children and teenagers: A systematic review. *Journal of Epidemiol Community Health, 72*(10), 958-966.
[310] Bratman, G. N., Hamilton, J. P., Hahn, K. S., Daily, G. C., & Gross, J. J. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proceedings of the National Academy of Sciences*, *112*(28), 8567-8572.
[311] Mennis, J., Mason, M., & Ambrus, A. (2018). Urban greenspace is associated with reduced psychological stress among adolescents: A geographic ecological momentary assessment (GEMA) analysis of activity space. *Landscape and Urban Planning, 174*, 1-9.
[312] Ibid.
[313] Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior*, *41*(5), 715-740.
[314] Nisbet, E. K., Shaw, D. W., & Lachance, D. G. (2020). Connectedness with nearby nature and well-being. *Frontiers in Sustainable Cities*, *2*, 18.

eco-anxiety, connecting with nature was the sole focus of a full quarter (26%) of interventions reviewed, attesting to clinician's faith in the healing power of nature.[315] Understanding the benefits of both nature exposure and nature connectedness, the campus of Grauer School, a grades 7-12 school in Encinitas, California is intentionally situated on nearly 40% of a wildlife and native habitat corridor, with classes spending a significant amount of time outdoors. The idea is that such early life experiences connecting with nature will prime young people for environmental engagement and stewardship later in life.[316]

Conversely, nature also has the potential to remind individuals of what's "at stake" in the future due to the impact and frustration of climate change — potentially leading to negative thoughts and psychological distress. In essence, some youth "grieve" the future. As an example, one youth described their experience with nature in detail: "All I see is lovely trees and that reminds me that we are killing all the trees and then I feel angry and sad, so I won't or can't go there anymore. If people stupidly tell me that time in nature is healing all I can say to them is that all I see is dying animals and plants."[317] The National Museum of Natural History's Teen Earth Optimism program aims to shift the climate change conversation from being problem-focused to solution-focused, sparking optimism instead of "doom and gloom" with expert and youth interviews.[318] Similarly, the Center for Public Engagement with Science created the Youth Engaging in the Science of Resilience (YES-Resilience) Teen Climate Ambassadors Program, with a focus on those who identify as BIPOC. The program explores the impacts of climate change in rural North Carolina and ways to improve community resilience.

Black Americans and Nature

For generations, Black Americans' relationship with nature and the use of land and outdoor spaces has been complex. Violence against Black Americans, including the forced labor during slavery and lynchings, often occurred in wilderness spaces.[319] Additionally, there is a long history of discrimination and exclusionary policies at national parks and other wilderness spaces,[320] with incidents continuing today.[321] Leah Penniman, the founder of Soul Fire Farm, which aims to empower African Americans by teaching them to grow their own food, has described this tendency of African Americans to feel estranged from the land and nature. "When people of African heritage come to Soul Fire Farm for the first time, they almost invariably make references to slavery. They say things like 'I don't stoop', 'I don't touch bugs', 'I left the plantation long ago,' and 'My grandfather told me never to get dirty.' We have this notion that the land herself was the oppressor, rather than the place where the oppression took place. When we let

[315] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[316] Hahn, E. R. (2021). The developmental roots of environmental stewardship: Childhood and the climate change crisis. *Current Opinion in Psychology*.
[317] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[318] National Museum of Natural History. (2021). *Teen Earth Optimism* [Video].
[319] Finney, C. (2014). *Black faces, white spaces: Reimagining the relationship of African Americans to the great outdoors*. UNC Press Books.
[320] Ibid.
[321] Nir, S. M. (June, 14 2020). *How 2 Lives Collided in Central Park, Rattling the Nation*. New York Times.

trauma estrange us from the land, we lose a lot."[322] Like Soul Fire Farm, other programs have also aimed to "reintroduce" Black Americans to the land and nature, such as Project Sweetie Pie in North Minneapolis, which employs and trains diverse youth in urban farming.[323] Some local farming programs have found success, but on a larger scale, U.S. Black farmers have faced discrimination at the federal level for decades.[324] There is also a current multi-state class-action lawsuit against the largest privately owned seed company in the world with claims that they sold Black farmers flawed soybean seeds in order to drive them out of business.[325] Thus, prescriptions to connect with nature as a means of ameliorating climate emotions and building resilience may be fraught with complexity for some Black Americans.

Climate Action

Experts suggest that engaging in climate action may be a particularly powerful and efficient strategy for addressing the mental health burden of climate change, as activism can simultaneously mitigate both mental health impacts and target the underlying threat (climate change), providing co-benefits for both the individual and society as a whole.[326,327] At its core, climate distress often involves feelings of uncontrollability and helplessness, due to the scope and size of the problem.[328] Activism can help address feelings of uncontrollability and helplessness by helping individuals to focus on what they *can* control, and promoting a sense of agency, efficacy, competence, and empowerment.[329,330] Indeed, research suggests that taking action can promote positive feelings and buffer the mental health impacts of climate change. Studies have revealed positive correlations between happiness and environmental action,[331,332] and, even among individuals who perceive climate change as a severe threat, engaging in behaviors to reduce one's carbon footprint can result in lower depressive symptoms.[333] When climate action occurs in a group setting, it also involves social engagement and promotes social bonds that can foster positive emotions, create a greater sense of agency, and help build

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[322] Frisch, T. (2019, July). *To free ourselves, we must feed ourselves*. The Sun Magazine.
[323] Hirsi, I. (2014, July 17). *Project Sweetie Pie teaches north Minneapolis youth about gardening*. MinnPost.
[324] Hegeman, R. & Breedman, A. (2021, September 1). *Black farmers await billions in promised debt relief*. AP News.
[325] Othering and Belonging Institute. (October 28, 2021). *Justice for Black Farmers: A conversation to uproot racist policy and plant seeds of redress*.
[326] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[327] Clayton, S. (2020). Climate anxiety: Psychological responses to climate change.
[328] Panu, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability*, *12*(19), 7836.
[329] Doherty, T. (2015). Mental health impacts (2015). In B. Levy, & J. Patz (Eds.). *Climate change and public health* (pp. 195-214). Oxford University Press.
[330] Schwartz, S. E. O., Benoit, L., Clayton, S., Parnes, M. F., Swenson, L., & Lowe, S. R. (2022). Climate change anxiety and mental health: Environmental activism as buffer. *Curr Psychol.*
[331] Corral-Verdugo, V., Mireles-Acosta, J. F., Tapia-Fonllem, C., & Fraijo-Sing, B. (2011). Happiness as correlate of sustainable behavior: A study of pro-ecological, frugal, equitable and altruistic actions that promote subjective wellbeing. *Human Ecology Review*, 95-104.
[332] Howell, A. J., & Passmore, H. A. (2013). The nature of happiness: Nature affiliation and mental well-being. In *Mental well-being* (pp. 231-257). Springer, Dordrecht.
[333] Bradley, G. L., Reser, J. P., Glendon, A. I., & Ellul, M. C. (2014). Distress and coping in response to climate change. In *Stress and anxiety: Applications to social and environmental threats, psychological well-being, occupational challenges, and developmental psychology climate change* (pp. 33-42).

emotional resilience.[334] Indeed, a new research study in a sample of 284 young adults (ages 18-35) found that taking collective action, but not individual action, attenuated the relationship between climate anxiety and major depressive disorder symptoms,[335] suggesting that group activism may prevent climate anxiety from progressing into more serious mental health issues.

Although not specific to climate activism, research has found that civic engagement is associated with a host of other benefits among young people. For example, one study found that various forms of civic engagement (voting, volunteering, and activism) in late adolescence and early adulthood were associated with higher income and educational attainment in adulthood.[336] Civic engagement is also theorized to lead to greater social support and the development of mastery, belonging, independence, and altruism, all of which are thought to be key factors in establishing ongoing resilience in youth.[337]

The Many Forms of Climate Action

Climate action can take a variety of forms, including making individual lifestyle changes such as taking public transportation or reducing waste, supporting or voting for politicians or policies that promote climate mitigation, or engaging in activism such as strikes, boycotts, signing petitions, or protests. Sarah Jaquette Ray, a professor of environmental studies at Humboldt State University and author of *A Field Guide to Climate Anxiety*, suggests that climate action can begin by first identifying one's unique "spheres of influence" — including for example one's personal life, family, community, campus, culture, and more — where changes can be made.[338] "When you begin to see all the people with whom you have reciprocal relationships, and all the potential points of intervention in the systems in which you function daily, you can recognize the ways that you already have a significant amount of power," Ray writes.[339] Individuals are then urged to consider their unique skills, talents, and passions. Similarly, Leslie Davenport has encouraged a broader conceptualization of activism beyond the most common conceptualizations (e.g., political protests and strikes).[340] For example, a person who works in the restaurant industry might push new protocols that reduce food waste; an elementary school teacher might promote a supplementary curriculum that encourages age-appropriate climate education and actions; a young churchgoer might encourage their church youth group to engage in regular neighborhood cleanups.

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[334] Bamberg, S., Rees, J. H., & Schulte, M. (2018). Environmental protection through societal change: What psychology knows about collective climate action—And what it needs to find out. In *Psychology and climate change* (pp. 185-213). Academic Press.
[335] Schwartz, S. E. O., et al. (2022). Climate change anxiety and mental health: Environmental activism as buffer. *Curr Psychol.*
[336] Ballard, P. J., Hoyt, L. T., & Pachucki, M. C. (2019). Impacts of adolescent and young adult civic engagement on health and socioeconomic status in adulthood. *Child Development*, *90*(4), 1138-1154.
[337] Dolan, P. (2012). Travelling through social support and youth civic action on a journey towards resilience. In *The social ecology of resilience* (pp. 357-366). Springer, New York, NY.
[338] Ray, S.J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet.*
[339] Ibid, p. 57.
[340] Davenport, L. (2021, October 26). *Facing climate change with emotional strength*.

A Thoughtful Approach to Activism

While activism has the potential to confer benefits for both individual and societal well-being, and is supported by research as an effective strategy for coping with climate anxiety, experts have cautioned that activism efforts should only be undertaken after emotions have been acknowledged and processed. Using climate action as a means of ignoring or displacing feelings is not recommended.[341] Additionally, climate activism often entails spending significant time thinking about climate change, and devoting substantial energy to a problem that is quite daunting and likely to be riddled with setbacks.[342] This can undermine feelings of efficacy or empowerment that activism may have conferred. Thus, experts recommend those regularly engaged in activism to balance their efforts with breaks for self-care and emotional resiliency work; this is important to avoid burnout and "apocalypse fatigue"[343] commonly experienced by climate workers, scientists, and frontline disaster workers (L. Davenport, personal communication, September 23, 2021).[344] In *A Field Guide to Climate Anxiety,* Ray writes about the need to alter the ways that we conceptualize progress, to avoid the disappointment and disillusionment that can come when the results of climate activism aren't immediately visible. Drawing on the work of Rebecca Solnit, Ray emphasizes the ways that social change often happens in "small, often unglamorous, or even invisible stages"[345] and quotes Howard Zinn: "Revolutionary change does not come as one cataclysmic moment (beware of such moments!) but as an endless succession of surprises, moving zigzag toward a more decent society."[346]

Given the disproportionate impact of climate change on disadvantaged and historically marginalized communities (e.g., BIPOC, LGBTQ+, undocumented immigrants), they may have the most to gain from engaging in activism. However, because activism can become closely linked to identity for many young people, they may also experience the most stress and depletion if outcomes are not obtained.[347] Authors of a recent paper on the effects of climate change on mental health in youth responded to this problem with the following recommendation:

> It is important for healthcare professionals working with youth to not simply 'prescribe' activism or civic engagement as a way to cope with climate distress, but rather to help young people critically consider what type of engagement may be best for them and what kinds of support they need to make their engagement healthy, meaningful, and sustainable.[348]

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[341] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[342] Randall, A. (2015). Mobilizing action on climate change and migration: The UK Migration and Climate Change Coalition. In *Organizational Perspectives on Environmental Migration* (pp. 177-184). Routledge.
[343] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.
[344] Hickman, C. (2020). We need to (find a way to) talk about… eco-anxiety.
[345] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*, p. 60.
[346] Zinn, H. (2004). *The optimism of uncertainty* (pp. 85-86). Quoted in Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet* (p. 60). University of California Press.
[347] Ballard, P. J., & Ozer, E. J. (2016). The implications of youth activism for health and well-being. In J. Conner & S. M. Rosen (Eds.), *Contemporary youth activism: Advancing social justice in the United States* (223-244). ABC-CLIO.
[348] Van Nieuwenhuizen, A. et al. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations.

Self-Care

Engaging with climate change can be exhausting and can lead to burnout if not balanced with appropriate self-care. Existing interventions have helped patients identify different elements of a self-care routine to help them recover and replenish their energy and internal resources.[349] Self-care can include taking media breaks, going for a run, cooking a meal, taking a nap, or engaging in any activity that triggers positive feelings and a sense of well-being. While some people may dismiss the need for self-care, seeing it as indulgent, selfish, or prohibitively time consuming, self-care should be recognized as a practice that benefits not just the individual but others around them, and is also an essential component of productivity.[350] According to Leslie Davenport, "When you take time for yourself, you will feel more energetic, and will be able to do more for and with others." Davenport emphasizes the need to incorporate self-care as an ongoing (versus one-time) practice, one that helps to build resilience and prevent burnout.[351]

Physical activity can be an important part of self-care. Researchers have recognized the importance of staying physically active in building resilience.[352] Physical activity helps regulate mood and boosts confidence, which can be useful for facing major, chronic stressors like climate change.[353] In addition to physical activity, maintaining other healthy habits such as good sleep and eating habits can buffer the negative effects of stressors.[354]

Climate Justice Awareness

Climate (or environmental) justice is a term/movement that acknowledges how the climate crisis is connected to issues such as racial discrimination, poverty, human rights, and the unfair distribution of resources. The climate justice movement recognizes that those who suffer the worst consequences of climate change are most often those who are least responsible for creating the crisis — including young people and those living in developing countries that produce fewer emissions per capita than richer, more polluting nations, such as the U.S. In the words of UN Secretary-General António Guterres, "Climate change is happening now and to all of us. No country or community is immune. And, as is always the case, the poor and vulnerable are the first to suffer and the worst hit."[355] Indigenous communities, people of color, low-income communities, young people, the elderly, women, and people with disabilities and chronic health conditions are all more vulnerable to the consequences of climate change, including extreme temperatures, climate-related disasters, poor air quality, and food/water shortages.[356]

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[349] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[350] Davenport, L. (2021, October 26). *Facing climate change with emotional strength*.
[351] Ibid.
[352] Iacoviello, B. M., & Charney, D. S. (2014). Psychosocial facets of resilience: Implications for preventing posttrauma psychopathology, treating trauma survivors, and enhancing community resilience. *European Journal of Psychotraumatology*, *5*(1), 23970.
[353] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[354] Ojala, M. (2013). Coping with climate change among adolescents: Implications for subjective well-being and environmental engagement.
[355] United Nations Sustainable Development Goals. (2019, May 31). *Climate Justice*. United Nations.
[356] Simmons, D. (2020, July 29). *What is "climate justice"?* Yale Climate Connections.

Climate justice addresses “environmental racism,” which refers to how people of color are often exposed to disproportionate levels of pollution and other hazards. For example, a 2018 study by the EPA’s National Center for Environmental Assessment found that facilities emitting particulate matter pollution — a kind of air pollution associated with a host of health problems, including asthma, heart attacks, and premature death — disproportionately impact communities of color and low-income communities.[357] The study found that Black Americans are exposed to 1.54 times more particulate matter, and Hispanic Americans to 1.20 times more particulate matter, compared with the overall population. Additionally, individuals living in poverty were found to experience 1.35 times the overall population average. The study cited historic racism and economic inequality as major factors in the siting and development of facilities emitting particulate pollution.[358] Communities of color and low-income communities also tend to have older infrastructure, and thus are at greater risk for structural damage, power outages, and other impacts when climate-related disasters hit, like hurricanes, floods, and fires.[359]

It is vital that climate interventions recognize and acknowledge the overlapping issues facing many BIPOC communities, including racism. National environmental justice leader Jacqueline Patterson often references a quote by author Audre Lorde: “There is no such thing as a single-issue struggle because we do not live single-issue lives.”[360,361] Lorde’s statement is relevant in that for many people of color in this country, concerns about climate change are deeply interconnected with other issues affecting their everyday lives.[362] It is impossible to fully understand, acknowledge and support the psychological toll of climate change on BIPOC, low-income, historically marginalized, and underserved communities without taking into account the multiplying threats of racism, violence, poverty, and discrimination in this country (J. Sasser, personal communication, October 19, 2021). Thus, intervention efforts to support diverse groups need to address the overlapping and interacting threats that face these communities.

Leslie Davenport suggested that efforts to support those coping with climate anxiety should involve educating individuals about climate justice issues (personal communication, September 23, 2021). Beyond simply raising awareness about climate justice issues, interventions can guide individuals (using exercises and activities in youth, for example) to clarify and articulate their personal values and stance on these issues, with the goal of supporting people to become part of a just solution (L. Davenport, personal communication, September 23, 2021).[363]

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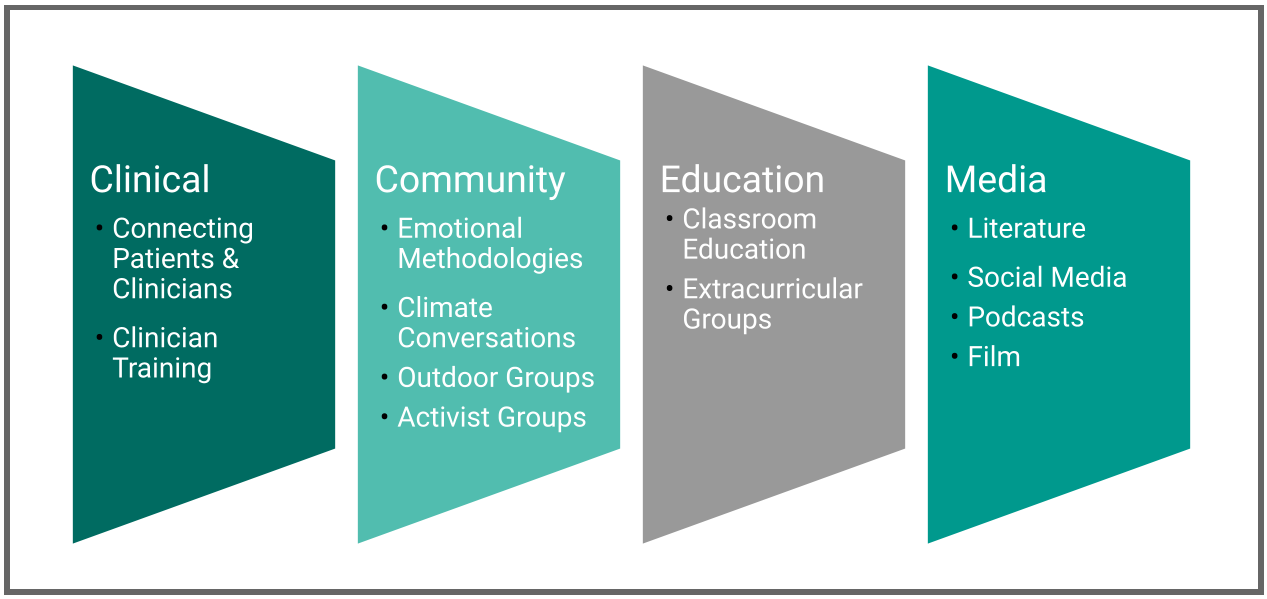
[357] Mikati, I., Benson, A. F., Luben, T. J., Sacks, J. D., & Richmond-Bryant, J. (2018). Disparities in distribution of particulate matter emission sources by race and poverty status. *American Journal of Public Health*, *108*(4), 480-485.
[358] Ibid.
[359] Cho, R. (September 22, 2020). *Why climate change is an environmental justice issue*. Columbia Climate School.
[360] Lorde, A. (1982). Learning from the 60s. In *Sister outsider: Essays and speeches* (13444).
[361] Patterson, J. (2021). *Memo to the Biden administration: What not to do on climate*. Thomson Reuters Foundation.
[362] Patterson, J. & DeBacker, L. (2021). *Environmental Funders: The Problem Isn’t Just Diversity. It’s Access to Money*. Medium.
[363] Davenport, L. (2021). *All the feelings under the sun: How to deal with climate change*. American Psychological Association.

Key Intervention Approaches

After reviewing the foundational elements of interventions and identifying core components or strategies for coping with climate anxiety, we conducted an in-depth search of existing interventions and resources. In the following section, we highlight those resources that (1) incorporate a maximum number of the core components we identified as promising for supporting climate emotions, given that they are empirically supported as effective for related issues, and (2) are readily available and relevant to young people, particularly those who reside in California and/or identify as BIPOC. As a note, culturally-tailored approaches and resources were found to be highly limited. Dr. Jade Sasser spoke of the dire need for culturally-sensitive interventions and resources for BIPOC populations (J. Sasser, personal communication, October 19, 2021). Conducting more research with these groups (such as focus groups/interviews combined with quantitative surveys) may provide insights to inform their development and potentially address overlapping social justice issues specific to certain communities/populations.

Using our review of existing resources and interventions, we created a schema of key resources available to youth coping with climate anxiety, including clinical, community, education, and media resources (Figure 11). Under the heading of each section (i.e., Clinical Resources, Community Resources, Education Resources, and Media Resources), we indicate the core components that are generally employed by these intervention approaches; components are listed in order of how relevant or central they are to that particular approach.

Figure 11. Existing resources and interventions



Clinical Resources

Core components employed (in order of relevance):

While there are few clinical programs and interventions created to specifically address climate anxiety and eco-emotions to date, clinical therapies are nascent. In recent years there has been an emergence of “climate-aware therapists”, professionally-trained psychotherapists who recognize the impacts of climate change on mental health, which can include cognitive, affective, interpersonal, societal, and existential repercussions. They provide psychological services to attend to this distress and empower their patients.[364,365,366] While empirically-based clinical interventions are limited and emerging, a recent review identified 13 journal articles describing specific psychological approaches for supporting individuals or groups with eco-anxiety.[367] Across these 13 articles, the review identified five major psychological approaches or themes. The first approach was “fostering clients’ inner resilience,” which included reframing eco-anxiety, cultivating meaning, hope, and optimism, and engaging in self-care, among other strategies. The second approach was “helping clients find social connection and emotional support by joining groups,” which referenced practitioners giving clients specific recommendations for joining established groups dedicated to supporting individuals with eco-anxiety, such as Carbon Conversations and The Work that Reconnects groups. The third approach was “encouraging clients to take action,” including making lifestyle changes and engaging in collective action. The fourth approach was “practitioners’ inner work and education”, that is, having practitioners explore their own relationship with and emotions around climate change topics prior to sessions with clients and to ensure that they have significant training around processes related to climate emotions, such as trauma and grief.[368] The fifth and final approach was “connecting clients with nature”, which involved taking nature walks and holding therapy sessions outdoors.[369]

[364] Whitcomb, I. (2021, April 20). *Climate anxiety and PTSD are on the rise. Therapists don't always know how to cope*. The Guardian.
[365] Gattuso, R. (2021, September 22). *Wellness in a world on fire: Therapy tackles climate change*. Talkspace.
[366] Wray, B. (2020, August 5). *Why activism isn’t *really* the cure for eco-anxiety and eco-grief*.
[367] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[368] Ibid.
[369] Ibid.

Connecting Patients & Clinicians

There are two primary resource hubs for individuals seeking climate-aware therapists and for mental health practitioners wanting to expand their practice to support individuals coping with climate change-related mental health impacts, the Climate Psychology Alliance and the Climate Psychiatry Alliance.

The Climate Psychology Alliance is a global organization that provides a variety of resources for both individuals looking for treatment as well as therapists looking to expand their practice.[370,371] The Climate Psychology Alliance North America website contains a Climate Aware Therapist Directory for individuals looking to find climate-aware therapists across the country.

The Climate Psychiatry Alliance[372] is another resource for individuals seeking climate-focused clinical support and for practitioners who want to integrate climate-aware therapy into their practice. This alliance offers a list of resources for mental health professionals, patients, and caregivers looking to learn about climate-aware therapy and take action in the face of climate-related disasters, such as extreme weather events. The Climate Psychiatry Alliance website also offers registration for practitioners and the same climate-aware therapist directory as the Climate Psychology Alliance, as it was created in collaboration between organizations.

Clinician Training

There has been a call for an increase in both awareness and training for mental health professionals to help them better support those psychologically impacted by climate change.[373] In a study investigating how often climate distress emerged in the therapeutic setting and how practitioners handled it, researchers found that 50% of the therapists interviewed felt that they were not adequately prepared to deal with eco-anxiety.[374] To begin to meet this need, training programs for therapists organized by national and international organizations as well as by practitioners are starting to emerge.

The American Psychological Association (APA)'s Office of Continuing Education (CE) in Psychology is taking the lead by offering a 1-credit CE course. The course involves reading an article in the APA *Monitor on Psychology* "CE Corner" on "Addressing climate change concerns in practice", an online learning exercise, and a CE test.[375] This course allows practitioners to expand their knowledge on climate-aware therapy while also gaining further certification and staying up to date on critical developments in the field of psychology.

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[370] Climate Psychology Alliance. (2021). *What We Do*.
[371] Climate Psychology Alliance North America. (2021). *Home*.
[372] Climate Psychiatry Alliance. (2021). *Home*.
[373] Clayton, S. et al. (2017). *Mental health and our changing climate: Impacts, implications, and guidance*.
[374] Seaman, E. B. (2016). *Climate change on the therapist's couch: How mental health clinicians receive and respond to indirect psychological impacts of climate change in the therapeutic setting* [Master's Thesis, Smith College for Social Work].
[375] Schreiber, M. (2021, March 1). *Addressing climate change concerns in practice*. Monitor on Psychology.

The Australian non-profit, Psychology for a Safe Climate (PSC) offers a professional development series designed to equip health and mental health professionals with the knowledge and skills needed to become more climate aware.[376] The 3-session series consists of an introductory webinar and experiential and professional practice workshops. Practitioners completing the program are designated by PSC as "climate aware" practitioners and are listed on PSC's Climate Aware Practitioner Directory, which was released in October of 2021.[377]

Dr. Thomas Doherty, a licensed psychologist specializing in the psychological aspects of environmental issues, has designed an Ecotherapy and Climate Conscious Therapy Training and Consultation for Mental Health Professionals. This extensive, 10-session, weekly group-based online training was created for mental health practitioners in need of expert guidance and peer support for ecotherapy or climate-conscious therapy. The international program includes an overview of educational topics, case consultation, discussion and role-plays, provider self-care, and tips for professional practice building.[378]

Leslie Davenport, a licensed integrative psychotherapist and climate psychology consultant referred to throughout this report, promoted climate awareness among mental health practitioners with the 2017 publication of her book, *Emotional Resiliency in the Era of Climate Change: A Clinician's Guide*. In this book, Davenport presents comprehensive theory, strategies, and resources to support practitioners in addressing key clinical themes specific to the psychological impact of climate change.[379] Davenport is also developing an online training program through the California Institute of Integral Studies to commence in Fall 2022. Expected to be the most comprehensive available for mental health practitioners, it will consist of 70+ hours of training with continuing education credits. Topics covered will include understanding the mental health and lifestyle impacts of climate change and developing therapeutic tools for helping patients effectively cope with these impacts.[380] The previously mentioned Climate Psychology Alliance North America website also offers education and training for mental health professionals. They also provide a list of resources relevant to practitioners on their website.

The American Psychological Association's (APA) Division 34: Society for Environmental, Population and Conservation Psychology provides resources to researchers and mental health professionals interested in topics related to humans and nature, including synergies between human mental health and the ecology of the natural environment. The division "maintains websites, an electronic mailing list, and social networking sites; publishes newsletters; organizes APA convention programs; publicizes activities and employment opportunities; and promotes diverse approaches in the study of environmental psychology."[381]

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[376] Psychology for a Safe Climate. (2021). *PD for climate aware practitioners*.
[377] Psychology For A Safe Climate. (2021). *CAP Member Directory*.
[378] Doherty, T. (2021). *Consultation Group*. SustainableSelf.
[379] Davenport, L. (2017, January 19). *Emotional resiliency in the era of climate change: A clinician's guide*.
[380] California Institute of Integral Studies. (n.d.). *Climate psychology in therapeutic practices*.
[381] American Psychological Association. (2020, October). *Society for environmental, population and conservation psychology*.

BIPOC Considerations (Clinical)

It has been well-established that BIPOC populations are affected by climate change more so than other racial/ethnic groups.[382] The degree that climate change impacts one's mental health depends on the level of exposure, personal characteristics, and socio-economic factors.[383] But, as noted by Dr. Jade Sasser, social justice issues such as racism and discrimination may further contribute to an individual's vulnerability (J. Sasser, personal communication, October 19, 2021) — ultimately having implications for the strategies to be used. A study of BIPOC college students found that they are less likely to seek mental health support relative to White students.[384] Yet, in a series of interviews with climate-aware therapists, Dr. Britt Wray found that the overall sentiment is that their clients generally do not include BIPOC individuals.[385] Socio-economic and structural factors aside,[386] barriers to mental health care among BIPOC populations include perceived stigma, long-held community beliefs and norms around mental health, knowledge and self-efficacy, and individual or familial religious/spiritual beliefs.[387,388] Race and discrimination were also found to be barriers to seeking mental health care, further signifying its importance among BIPOC young adults.[389] When interviewed by Wray, Dr. Caroline Hickman suggested that "therapists should not forget to go under the surface, to look more analytically at unconscious processes and explore the intersections and parallels between the harms of racism and those of climate change."[390]

Because BIPOC engagement in mental healthcare has been difficult, effectively reaching this population will require mental health practitioners to self-reflect and potentially extend themselves beyond traditional practices. For example, the resilience strategies they use may need to be implemented differently (e.g., culturally-tailored approach) for BIPOC youth. A recommendation has been to eliminate positional hierarchies when working with BIPOC young people. For example, bypassing BIPOC children and adolescents and only speaking with their parent(s)/caregiver(s), could negatively impact progress.[391] Also related to power, in Wray's

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[382] Gamble, J. L. et al. (2016). *Ch. 9: Populations of concern. The impacts of climate change on human health in the United States: A scientific assessment*.
[383] U.S. Environmental Protection Agency. (2020). *Understanding the connections between climate change and human health*.
[384] Hingwe, S. (2021). Mental health considerations for black, indigenous, and people of color: Trends, barriers, and recommendations for collegiate mental health. In *College Psychiatry* (pp. 85-96). Springer.
[385] Wray, B. (August 4, 2020). *The budding field of climate-aware therapy must be decolonized to serve BIPOC communities*. Gen Dread, Substack.
[386] Takeshita, M. (2021). *Improving the path to mental health treatment: Mitigating stigma and distrust in black America* [Doctoral dissertation, Department of Psychology, Haverford College].
[387] Hingwe, S. (2021). Mental health considerations for black, indigenous, and people of color: Trends, barriers, and recommendations for collegiate mental health.
[388] Alegria, M., Falgas‐Bague, I., & Fong, H. F. (2020). Engagement of ethnic minorities in mental health care. *World Psychiatry*, *19*(1), 35.
[389] Hingwe, S. (2021). Mental health considerations for black, indigenous, and people of color: Trends, barriers, and recommendations for collegiate mental health.
[390] Wray, B. (August 4, 2020).*The budding field of climate-aware therapy must be decolonized to serve BIPOC communities*, paragraph 15.
[391] Alegria, M. et al. (2020). Engagement of ethnic minorities in mental health care.

interview with Dr. Jennifer Mullan, Dr. Mullan speaks to the potential harms of power and privilege when working with BIPOC populations in clinical care, and suggests that climate-aware therapists "dismantle the oppressor within" and provide a space for collective learning, self-reflection, and accountability.[392] Clinical engagement with BIPOC youth requires clinicians to understand the many barriers to treatment and take steps to meet BIPOC youth where they are. Efforts can be made at the individual practice level, however, climate-aware therapists should work collectively to seek systemic change.

Community Resources

Core components employed (in order of relevance):

Community-based groups range from well-developed programs to more informal conversations with peers and can be held in a variety of settings. These groups also vary in terms of age range and type of facilitation. For example, some are led by program leaders/facilitators, others are led by mental health professionals, and a few are even designed to be led by youth themselves. Here, we focus on groups that utilize emotional methodologies, climate conversations, outdoor groups, and activist groups.

Emotional Methodologies Groups

In our review of existing resources, we found a small range of non-clinical, therapeutic support groups that integrate emotional methodologies designated to foster connection, work through emotions, and build resilience. These often involve well-developed programs that are intended to engage individuals experiencing eco-emotions. Many of these community groups address all or most of the core components detailed above in Figure 10 in a non-clinical setting, making them promising programs for supporting those coping with climate distress.

"Emotional methodologies" is defined as "a range of methods which encourage the acknowledgment and expression or working through of emotions around socio-ecological issues, including climate change."[393] These methodologies vary in depth, timescale, scale and accessibility, and are intended to help people connect with and process difficult climate feelings, such as anxiety, grief, and dread, in ways that build courage, acceptance, and inner resilience.

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[392] Wray, B. (August 4, 2020). *The budding field of climate-aware therapy must be decolonized to serve BIPOC communities*, para. 2.
[393] Hamilton, J. (2020) *Emotional methodologies for climate change engagement: Towards an understanding of emotion in civil society organisation (CSO)-public engagements in the UK* [Ph.D. thesis, University of Reading].

[394] Emotional methodologies are varied, yet all work to help people move past denial and emotional paralysis towards a deeper understanding of their feelings. Unlike much climate-aware therapy, emotional methodologies are practices that are designed to be done in groups and are not necessarily facilitated by a mental health professional.[395] The group-centric design of emotional methodologies provides an integration of the psychological and social needs of eco-emotion intervention.

One group worth mentioning is the Good Grief Network (GGN), a well-developed peer support network for eco-emotion processing that offers a support group program, "10-Steps to Personal Resilience & Empowerment in Chaotic Climate," based on Alcoholics Anonymous, where participants work through important conversations in a supportive, community setting.[396] The 10 steps of the program are as follows: (1) accept the severity of the predicament, (2) practice being with uncertainty, (3) honor personal mortality and the mortality of all, (4) do inner work, (5) develop an awareness of biases and perception, (6) practice gratitude, witness beauty, and create connections, (7) take breaks and rest, (8) grieve the harm I have caused, (9) show up, and (10) reinvest in meaningful efforts.[397] These steps employ the core strategies for promoting resilience that we've identified and provide a well-structured framework for individuals to work through their emotions around climate change. Good Grief Network programs are often facilitated online by GGN facilitators who have gone through an extensive 12-week course, but they can also be run by any individuals interested in bringing the GGN program into their own community, after completion of a GGN Affiliate Facilitation Training.[398]

Another well-known network with similar offerings is The Work That Reconnects Network (TWTR), which offers a wide variety of activities, including workshops, study groups, webinars, conversation cafes, and retreats around the world. TWTR is known to be more philosophical in nature compared with other programs, as the program is based on the teachings of Joanna Macy, "a renowned activist and author whose life has been dedicated to helping people tap into the interconnectedness of all living things using a mixture of modern systems theory, Indigenous, and Buddhist philosophies."[399] TWTR framework, referred to as the spiral, involves 4 stages: (1) coming from gratitude, (2) honoring our pain for the world, (3) seeing with new/ancient eyes, (4) going forth.[400] Individuals are encouraged to use this spiral in relation to eco-emotions "as a way to cultivate inner resilience, healing, and connection."[401]

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[394] Ibid.
[395] Wray, B., Wilkinson, K., & E. Johnson, A. (2021). *Resources for working with climate emotions*. The All We Can Save Project.
[396] Ibid.
[397] Good Grief Network. (2021). *10-steps*.
[398] Good Grief Network. (2021). *Facilitating the 10-step program*.
[399] Wray, B. et al. (2021). *Resources for working with climate emotions*.
[400] Work That Reconnects Network. (2012). *The Work That Reconnects*.
[401] Wray, B. et al. (2021). *Resources for working with climate emotions*.

There is a new branch of The Work That Reconnects Network, called The Evolving Edge, which highlights an evolving body of work and adaptations to TWTR philosophy and practice to meet the needs of the global community. The Evolving Edge webpage highlights some of the areas in which TWTR work is being adapted by facilitators. One "area of evolution" is called "Undoing Oppression," and it focuses on "analysis, revision and adaptation of [TWTR], with the goal of dismantling oppression and empowering equity, dignity and respect within [TWTR] practices and community."[402] As part of this area of evolution, The Anti-Oppression Resource Group was created to explore ways of undoing oppression in TWTR facilitation. While this group is held with and for facilitators, it has led to the creation of various supplemental projects that are accessible to the public including *De-escalating Patterns of Harm in White Dominant Spaces: A guide for The Work That Reconnects facilitators and participants*,[403] a document summarizing patterns of harm in TWTR spaces that provides examples of what harmful patterns look like and includes suggestions for what facilitators can do differently in the future.[404] The Anti-Oppression Resource Group has also held webinars and drafted statements and revisions for the TWTR website, which has led to an overall shift in the way the program is practiced and framed.

Climate Conversations

Drawing on social connection as a resilience strategy, there are a variety of offerings for those looking to connect with others and share their feelings around climate change in spaces where their eco-emotions are welcomed. These open conversations tend to be more informal and maintain a focus on sharing emotions with peers, which can ease a person's sense of loneliness and isolation, and foster social connections.[405] In a review of existing published interventions for climate anxiety, Pauline Baudon and Liza Jachens noted that Joanna Macy's The Work that Reconnects groups and Rosemary Randall's UK-based Carbon Conversations groups[406] have been appraised by academic authors, as well as participants, for their ability to provide an emotionally safe space for participants.[407] Baudon and Jachens argue that these two non-clinical group models could, therefore, act as blueprints for group treatment of climate anxiety.[408] While Carbon Conversations may offer blueprints for group conversations, we focused our landscape assessment on group conversations that are readily offered in the U.S and engage a variety of climate-related topics. Many of the group conversation models that we found in our landscape assessment, which we term "climate conversations" here, have been recently developed and offer further intervention frameworks that have yet to be well-examined or evaluated.

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[402] Work That Reconnects Network. (2020, August 19). *Undoing oppression*.
[403] Anti-Oppression Resource Group. (2018). *De-escalating patterns of harm in white dominant spaces: A Guide for the Work That Reconnects facilitators and participants*.
[404] Work That Reconnects Network. (2021). *Anti-Oppression Resource Group*.
[405] Wray, B. et al. (2021). *Resources for working with climate emotions*.
[406] Carbon Conversations. (n.d.). *About*.
[407] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.
[408] Ibid.

Conversations Led by Trained Facilitators

There are two key offerings for individuals across the country interested in engaging in conversations led by trained professionals; both are offered virtually. The first is provided by the organization Climate Awakening, which is led by Margaret Klein Salamon, Ph.D., a clinical psychologist and climate activist whose work is centered around transforming climate despair into climate action.[409] Climate Awakening holds virtual Climate Emotions Conversations three times per month in small groups, guided by videos and conversation prompts. The conversations are free, open to all, and intended to not only connect climate-aware individuals but also inspire climate action. In turn, these conversations help to build social connection and activism as effective resilience strategies. Participants who have attended a Climate Emotions Conversation have reported feeling relief, connectedness, appreciation, and empowerment as a result of these small group gatherings.[410] The Climate Psychology Alliance runs Climate Cafés, which are similar conversation spaces, but rather than using videos and prompts, these conversations are led by trained facilitators. Climate Cafés are held virtually once a month, cost about $6 to participate in, and are open to young adults ages 18+.[411] These conversations are a great option for those looking to build social connections around climate issues as well as receive more therapeutic guidance in dealing with climate emotions from trained facilitators.

Climate Conversation Facilitation Guides

Due to the COVID-19 pandemic and initial development of climate emotion interventions, there are no climate conversation offerings that are regularly held in-person, to our knowledge. There are, however, fairly well-developed climate conversation programs that individuals and/or youth can use to facilitate conversations themselves within their own communities. One of these programs is the *All We Can Save* Circles, created by Dr. Katharine Wilkinson, one of the co-editors (along with Ayana Elizabeth Johnson) of the bestselling book *All We Can Save: Truth, Courage, and Solutions for the Climate Crisis*. These circles act as a mix between a book club and deeper climate emotion conversations, as they are centered around reading *All We Can Save*. *All We Can Save* is “an anthology of writings by 60 women at the forefront of the climate movement” from different backgrounds, ethnicities, and cultures.[412] The diverse and inclusive nature of the anthology is translated into *All We Can Save* Circles, making them a strong source of social connection and climate justice awareness as strategies for resilience. These Circles are self-organized using open-source facilitation guides for 10 gatherings or sessions, so they can be held anywhere and with any set of participants.[413] (While *All We Can Save* was created by women, the Circles are for everyone.) This makes *All We Can Save* Circles vastly accessible and malleable for individuals by providing them with a choice of setting and participation.

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[409] Salamon, M. K. (n.d.). *About*. Climate awakening.
[410] Ibid.
[411] Climate Psychology Alliance. (2021, Oct). *Climate café online: Sat 13th Nov 2021*.
[412] Wilkinson, K. K., & Johnson, A. E. (2021). *Anthology*. The All We Can Save Project.
[413] Wilkinson, K. K. (2021). *Circles*. The All We Can Save Project.

Another organization that offers an open-source guide to facilitation is Conceivable Future, a U.S. based women-led network that was created to bring awareness to the threat that climate change poses to reproductive justice.[414] This organization offers a Conceivable Future "House Party How-To" guide for individuals to engage in conversation centered around the ways that climate change affects individuals' choices to have children or not. This offering is more specific to reproductive choices and provides a space for individuals experiencing significant distress to express their concerns. As the percentage of youth hesitant to have children increases,[415] these spaces become more critical for adaptation and resilience by fostering social connection and acknowledgment/validation of feelings around climate change and reproductive decision making.

There is also a toolkit, the *Emotional Resilience Toolkit for Climate Work*, created by The Climate Therapy Alliance, that includes a facilitation guide and is meant to help support individuals engaged in climate activism and climate work specifically.[416] This toolkit was created by a group of psychotherapists specializing in climate psychology to support individuals experiencing climate emotions as they engage in climate-related work. It includes a compilation of five simple practices designed to build emotional resilience, promote self-care, and make room for safe expression of climate emotions.[417] These practices were designed to be led by anyone, are categorized by age group, and take 5-15 minutes to complete, making it easier for them to be integrated into a variety of settings.

Outdoor Groups

Building on connection with nature and social connection as core components of effective intervention, there are a number of youth groups engaging their communities in outdoor activity. Most towns, cities, and states have their own outdoor groups to engage with, but for the purposes of this report, we focused on some of the prominent BIPOC and/or California-based organizations that serve youth and young adults, outlined in Table 3. These groups provide outdoor experiences to youth that promote emotional well-being in the face of climate change and draw on both connections with nature and social connection as strategies for resilience.

[414] Conceivable Future. (2021). *Who We Are*.
[415] Marks, E., et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[416] Climate Therapy Alliance (Pacific Northwest Chapter). (2019). *Emotional resilience toolkit for climate work*.
[417] Climate Therapy Alliance (Pacific Northwest Chapter). (2019). *Emotional resilience toolkit for climate work*.

Table 3. Outdoor and hiking groups for youth

Demographic	Information	Description
BIPOC & CA-based	**Hike Clerb**[418]	An LA-based intersectional women's hike club. Inspired to take action by the lack of representation of people of color in the outdoors, Hike Clerb aims to equip BIPOC women with the tools, resources, and experiences they need to collectively heal in nature.
	Black Girls Trekkin'[419]	An LA-based group intended to inspire and empower black women to spend time outdoors, appreciate nature, and protect it.
CA-based	**Outdoor Outreach**[420]	Provides opportunities for San Diego youth to hike, bike, kayak, or climb. The mission of Outdoor Outreach is to connect youth to the transformative power of the outdoors.
	Outdoor Youth Connection[421]	Run by the California State Parks Office of Community Involvement and the California State Parks Foundation, this program aims to connect urban youth ages 13-17 with their peers, their community, the great outdoors, and their own leadership potential.
BIPOC & National	**Green Latinos Coalition**[422]	A non-profit that convenes a broad coalition of Latino leaders committed to addressing national, regional, and local environmental issues that significantly affect the health and welfare of the U.S. Latino community.
	Outdoor Afro*[423]	A non-profit that aims to inspire Black connections and leadership in nature. More than 100 leaders in 56 cities around the country connect thousands of people to nature experiences.

*Outdoor Afro was founded in the San Francisco Bay Area and expanded nationally

[418] HIKE CLERB. (n.d.). *About*.
[419] Black Girls Trekkin'. (n.d.). *Black Girls Trekkin'*.
[420] Outdoor Outreach. (2021). *About Us*.
[421] CA State Parks. (2021). *Outdoor Youth Connection*.
[422] Green Latinos. (2020). *About Our Organization*.
[423] Outdoor Afro. (2021). *About Us*.

Activist Groups

While there are no prominent activist groups that explicitly focus on supporting climate emotions, there are a variety of youth activist groups that are centered on engaging young people in both individual and collective action with the goal of mitigating climate change. These engage some of the components of promising interventions, namely climate action and social connection. Engaging in activism to directly address the underlying source of climate anxiety — especially when activism is balanced with the processing of emotions and self-care — can promote a sense of agency and empowerment, as previously discussed.

One example of a prominent youth-centered group that could be accessed by CA-based and non-CA-based youth is the Sunrise Movement. Sunrise is "a youth movement working to stop climate change and create millions of good jobs in the process."[424] They center their mission around three main priorities: (1) making climate change an urgent priority across America, (2) ending the corrupting influence of fossil fuel executives on U.S. politics, and (3) electing leaders who stand up for the health and wellbeing of all people.[425]

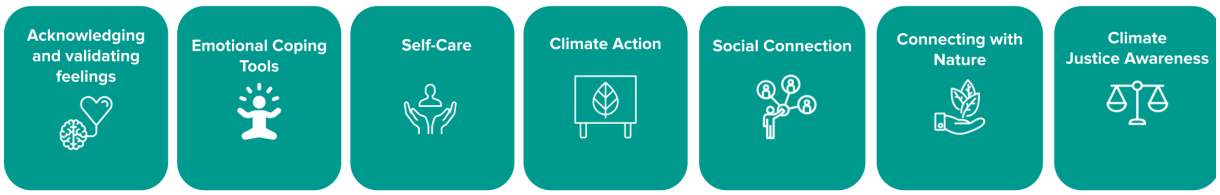
Another example is Fridays For Future, or FFF, a youth-led global climate strike movement that was initiated in August of 2018, when 15-year-old Greta Thunberg began a school strike to demand urgent action on the climate crisis.[426] Similar to the Sunrise Movement, "the goal of [FFF] is to put moral pressure on policymakers, to make them listen to the scientists, and then to take forceful action to limit global warming."[427]

There are also activist groups centered around climate justice that have formed to address the oppressive origins and ethical dimensions of climate change. One of these groups is Youth Vs. Apocalypse (YVA), "a diverse group of young climate justice activists working together to lift the voices of youth, in particular youth of color and working-class youth. [Their] collective action aims to fight for a livable climate and an equitable, sustainable, and just world."[428] YVA began in Oakland, CA when a group of local youth, supported by adults in their community, used direct action and lobbying to fight a proposed coal terminal in their city. The group continues to be CA-based, but has expanded its focus to national climate justice issues, and utilizes peer-to-peer community organizing to engage and connect youth.[429]

[424] Sunrise Movement. (2021). *About the Sunrise Movement*.
[425] Ibid.
[426] Fridays For Future. (n.d.). *Who We Are*.
[427] Ibid.
[428] Youth vs Apocalypse. (2020). *About Us*.
[429] Ibid.

Education Resources

Core components employed (in order of relevance):



Disseminating information about the climate crisis in educational settings involves a variety of potential challenges and possibilities. For example, there is potential for climate anxiety to transfer from educators to students or vice versa, and often both educators and students have joint emotional experiences when discussing and working through the topic of climate change.[430] This indicates that both educators and students need systems of support to help them work through climate anxiety and build emotional resilience. Below, we begin with a discussion of current approaches for incorporating emotional work into education about climate change and the environment. Then, we highlight available resources to support both teachers' and students' climate emotions in classroom settings, both at the K-12 and higher education levels. Next, we turn to extracurricular education, highlighting a few groups offering after-school programs, camps, and activities that can foster emotional resilience in youth.

Approaches in Education

While much of the research around climate emotions in education has centered around environmental education, there may be opportunities for these approaches to be applied to education more generally. Though research on eco-emotions in education is minimal, there are a few key researchers in environmental education who have been studying and developing a base of understanding around the connections between the two, their implications, and best practices/approaches for educators to utilize to support student wellbeing and resilience, as well as their own. These practices could potentially be applied in the classroom setting as well. Some of the pioneers in studying matters close to eco-anxiety in environmental education theory have been Panu Pihkala, Maria Ojala, Elin Kelsey, John Hicks, and Paul Maiteny.[431]

According to a recent review of research around climate anxiety and environmental education, authored by Panu Pihkala, the first step to addressing climate emotions in the classroom is for educators to acknowledge their own feelings so that they can effectively provide support to students. Pihkala also argues, based on his review of the literature, that for eco-emotions to be productively encountered in the educational setting, educators must (1) be sensitive to the emotions of all participants, and (2) be aware of their own emotions and reactions.[432] In essence, educators should take the initial steps to self-assess, prepare for open discussion, and prepare to engage with content that is emotionally instigative.

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[430] Pihkala, P. (2020). Eco-anxiety and environmental education. *Sustainability*, *12*(23), 10149.
[431] Ibid.
[432] Ibid.

Maria Ojala, a psychologist and environmental education scholar, has provided some of the most empirically-based, in-depth insights to date around the needs of educators and students in regards to eco-emotions. She highlights the importance of "critical emotional awareness" as an approach for both educators and students.[433] In this approach, various aspects of each emotion are considered so that individuals can recognize the productivity of their emotions at certain levels, rather than just the negative aspects.[434] Historically, education has not involved emotional considerations or has often portrayed emotional reactions in a negative way.[435] Maria Ojala's approach highlights the need to recognize the complexity of emotions and how they can lead to positive action.

Another environmental education researcher, Elin Kelsey, has examined ways of working with complex emotions in the environmental education space. She mainly emphasizes the importance of open treatment of despair and advocates for constructive hope as a strategy for working through eco-emotions in the classroom.[436] In a project she worked on in 2014, she displayed that the use of letters and other mediums that provide room for personal expression can help students and educators integrate emotions into the environmental education space and provide room for hope in discussions around climate change.[437]

Authors Richard Wallace, Jess Greenburg, and Susan Clark have also analyzed ways of confronting emotions in higher education environmental education classrooms. In a recent paper, they analyzed and presented a strategic guide for confronting anxiety and despair in environmental studies and sciences. Using limited data that exists and their own experiences as a guide, they argue that students and educators should be deeply sensitive to environmental education topics and the emotions they may elicit, and they provide seven strategies to engage this empathy in environmental education classrooms with a specific focus on higher education.[438] The strategies are as follows: (1) feelings around environmental topics (i.e. anxiety, despair, anger, etc.) should be discussed to avoid senses of isolation among students and/or faculty; (2) faculty should explicitly acknowledge and validate the struggles that their students are experiencing; (3) self-care and personal growth should be encouraged; (4) breaks should be encouraged; (5) make breaks and rest a norm with a focus on students' needs; (6) faculty should not only advise students appropriately but also design and administer course content

[433] Ojala, M. (2017). Facing anxiety in climate change education: From therapeutic practice to hopeful transgressive learning. *Canadian Journal of Environmental Education*, *21*, 41–56.
[434] Ojala, M. (2015). Hope in the face of climate change: Associations with environmental engagement and student perceptions of teachers' emotion communication style and future orientation. *The Journal of Environmental Education*, *46*(3), 133–148.
[435] Pihkala, P. (2020). Eco-anxiety and environmental education.
[436] Kelsey, E. (2016). Propagating collective hope in the midst of environmental doom and gloom. *Canadian Journal of Environmental Education (CJEE)*, *21*(0), 23–40.
[437] Kelsey, E. (2014.) Beyond doom and gloom: An exploration through letters. *RCC Perspectives*, 6.
[438] Wallace, R. L., Greenburg, J., & Clark, S. G. (2020). Confronting anxiety and despair in environmental studies and sciences: An analysis and guide for students and faculty. *Journal of Environmental Studies and Sciences*, *10*(2), 148–155.

that reduces students' anxieties and stress and builds individual and community resilience; (7) faculty should be overt and explicit in their design of assignments to normalize student anxiety.[439] While the overall understanding of best practices for integration of climate emotions into education is still developing, these strategies present a start for educators to consider these emotions and develop their courses and classes around this consideration.

There are also emerging pedagogical approaches that could be used by educators to integrate emotions into teaching practice. The most prominent and fast-growing approach is called contemplative pedagogy. This budding approach involves an effort to integrate contemplative practices (i.e. contemplation, mindfulness, silence, sensitivity to feelings within one's own body, etc.) into teaching.[440] While the benefits of contemplative practices in environmental education have not yet been well studied, some environmental educators have begun implementing them, especially in higher education. One of these educators is Marie Eaton, a faculty member at the Fairhaven College of Interdisciplinary Studies at Western Washington University. In a reflective paper on environmental trauma and grief, she wrote:

> As we work with students, these kinds of reflective and contemplative activities and shared stories about loss and commitment may help us search for hope or learn to live well without it. They hold promise for helping students negotiate the magnitude of their feelings of grief and helplessness in order to construct a new world view that can hold both the sadness and the possibilities for the future and harness that grief to make changes in our lives to help our fragile planet.[441]

Based on our research and discussions with educators, it seems that contemplative pedagogy is an educational approach with the potential to help build resilience among students in environmental education spaces, as it draws on many of our recommended core components.

Initial studies show that the complexity and diversity of emotions around climate change must be considered when approaching many environmental topics in educational settings. Additionally, studies show that collective hope should be advocated for, sharing of emotions should be encouraged, discussions should be open, and educators should examine their own emotions to provide non-judgemental support. While various approaches to emotional integration in environmental education continue to form and develop, it is worth noting that there are two overall themes between existing approaches: 1) emotions should be acknowledged and recognized to promote emotional awareness, and 2) empathy should be integral to discussion, activities, and all forms of classroom engagement.

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[439] Ibid.
[440] Gunnlaugson, O., Sarath, E. W., Scott, C., & Bai, H. (2014). Contemplative learning and inquiry across disciplines. *State University of New York Press*, 11.
[441] Eaton, M. (2012). *Environmental trauma and grief* [essay], pp 13. Fairhaven College, Western Washington University.

Classroom Resources

Resources to help educators integrate work with eco-emotions into their classrooms and courses are scarce; however, a few notable resources have begun to emerge. Below we highlight a resource hub and a toolkit geared towards higher education professors and students, as well as another resource hub more geared towards K-12 educators and students. In our search, we found few comprehensive, prominent resources, signifying that there is room for educational resources to grow to help educators address climate emotions in their classrooms.

The most comprehensive resource for educators, to date, is the "Existential Toolkit for Climate Justice Educators," a website created by Dr. Jennifer Atkinson, Dr. Sarah Jacquette Ray, Dr. Elin Kelsey, and Robyn Hutchings and funded by the Rachel Carson Center for Environment and Society to help support environmental educators in their integration of emotional work around climate change.[442] The hub consists of hundreds of curated resources for educators, particularly higher education professors. Resources are organized by three themes (reflection, resiliency, and justice), and four categories based on resource type (activities, journalism & popular articles, media & podcasts, and syllabuses).[443] To our knowledge, this resource hub provides the most in-depth look at all the ways that educators can integrate climate emotions and climate justice into their teaching and provides them with the tools needed to do so.

Additionally, researchers at the University of Technology Sydney have developed a climate anxiety toolkit for higher education educators and students called "Staying Sane in the Face of Climate Change: A Toolkit of Emerging Ideas to Support Emotional Resilience, Mental Health and Action".[444] The toolkit is "an attempt to integrate insights from the emergent field of climate psychology into teaching in order to build the capacity of educators and students of 'crisis' subjects to remain positive, resilient, and effective."[445] It consists of three sections: the first focuses on understanding and addressing emotional responses to the climate crisis; the second provides resources to help educators and students identify ways to participate in meaningful individual and collective action; and the third helps students identify potential career pathways aligned with positive environmental values and climate action, such as careers in environmental law, corporate social responsibility, and environmental management, and provides a number of examples of individuals who have brought environmental leadership to their industry. The toolkit is offered in two versions: one for students, and a slightly longer, more in-depth version for both students and educators. The toolkit has a creative commons license and is open for anyone to use, as long as the authors are properly acknowledged. The authors have plans to continue to update and develop the toolkit further and to conduct an evaluation of the toolkit for effectiveness.

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[442] An existential toolkit for climate justice educators. (2021). *About the existential toolkit website*.
[443] Ibid.
[444] Leimbach, T., et al. (2020). *Staying sane in the face of climate change: A toolkit of emerging ideas to support emotional resilience, mental health and action*.
[445] Leimbach, T., & Kent, J. (2021, November 17). *Webinar: Introducing a climate anxiety toolkit and generating insights from a co-evaluation process* [webinar]. The Association for the Advancement of Sustainability in Higher Education.

Another resource hub, geared towards K-12 educators, focuses on activism as a strategy for resilience and provides toolkits to help them inspire and empower their students in the face of climate change. The collaborative online hub, called Transform Our World, "supports teachers in bringing environmental and social action into the classroom [by] showcasing quality-rated resources, programmes and events available from various organizations."[446] One of their campaigns, Turning Anxiety into Action, focuses specifically on toolkits and resources that support teachers in addressing climate emotions and building activist resilience.[447]

Extracurricular Groups

To our knowledge, no youth extracurricular groups explicitly focus on supporting emotional responses to climate change. However, there are groups that help young people connect with nature, develop environmental values, engage in healthy habits and exercise, and foster social connections with other environmentally-minded youth, all of which provide foundations for both physical and emotional resilience. One example is Biocitizen, a school of field environmental philosophy with three locations in the U.S., including Los Angeles.[448] They offer summer camps, after-school enrichment, day hikes, and overnight trips for children and teens. The ethos of Biocitizen involves teaching students about the place where they live, with the idea that this will motivate them to take care of it. Through immersive experiences in nature such as hiking, camping, and restoration projects, Biocitizen aims to foster a sense of wonder, to help young people develop connections with the natural world, and to learn environmental stewardship.

A second example is Acta Non Verba ("actions not words"), a youth urban farm project founded and led by women of color in East Oakland, California that offers outdoor after-school programming, camps, and farm days for youth (K-12) and their families.[449] Located in an urban area, Acta Non Verba was designed to meet the needs of young people and families in a community suffering from pollution, high crime rates, poverty, low education standards, and poor access to green spaces and fresh food. The programming serves low-income African-American and Latino families and offers services including education, childcare, economic empowerment, and access to green, safe spaces, and healthy food. Young people in Acta Non Verba programs focus on nature-based experiences such as hiking, gardening, and learning about concepts such as Leave No Trace and stewardship. Youth learn to grow and harvest organic, culturally-relevant food on the farm, and learn to cook healthy meals that they can make at home. They also gain vocational skills by marketing and selling produce at the organization's Farmstand. Profits from the sale of the produce are then deposited into participating youths' educational savings accounts.[450] The farming aspect of this project can be considered a form of climate activism, as growing local, organic produce and creating urban green spaces are powerful solutions for mitigating climate change and building resilient communities.

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[446] Transform Our World. (n.d.). *About Transform Our World*.
[447] Transform Our World. (n.d.). *Transform Our World: Turning anxiety into action*.
[448] Biocitizen. (n.d.). *About Biocitizen*.
[449] Acta Non Verba: Youth Urban Farm Project. (n.d.). *Our mission*.
[450] Ibid.

Media Resources

Core components employed (in order of relevance):

The term mass media "refers to channels of communication that involve transmitting information in some way, shape, or form to large numbers of people."[451] These channels of communication are often technological devices, which can make messages public, extend the availability of messages, and reach large audiences in a short amount of time (e.g., television, documentaries, podcasts, social media, etc.).[452] Thus, media holds considerable promise as an intervention approach given its potential to quickly reach large swaths of the population. Research shows that media approaches, such as environmental films, can increase awareness about environmental issues, trigger concern for threatened species, and motivate behavior change.[453] Mass media's scope of influence and effects on behavior point to a potential for media to expand the scope of intervention for climate emotions. We focus on literature, social media, podcasts, and film as sources of intervention.

Literature

In this section, we detail some of the primary literary resources available for youth in two different age groups; tweens/young adolescents (ages 11-14), and older adolescents/young adults (ages 15 - 25).

Tweens/Adolescents

Leslie Davenport authored *All the Feelings Under the Sun: How to Deal With Climate Change*, a book for tweens and younger adolescents to work through their climate emotions using informative text and activities to provide them with the tools needed to manage anxiety and create positive change.[454] The interactive nature of the book provides children and tweens with age-appropriate tools for managing their emotions, and the last two chapters of the book ("Practicing Eco-Justice" and "Making the World Healthier Together") provide them with information about environmental justice and activism, which we've identified as strategies characteristic of effective intervention.

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[451] Livesey, C. (2011). Defining the mass media. *Sociology Central*.
[452] Potter, W. J. (2013). Synthesizing a working definition of "mass" media. *Review of Communication Research*, *1*, 1–30.
[453] McCormack, C. M., K Martin, J., & Williams, K. J. (2021). The full story: Understanding how films affect environmental change through the lens of narrative persuasion. *People and Nature*.
[454] Davenport, L. (2021). *All the feelings under the sun: How to deal with climate change*.

Older Adolescents/Young Adults

There are a few literary resources, to date, made for older adolescents and young adults to provide them with tools for managing climate emotions and promoting successful adaptation and resilience in the face of climate change. One of these resources, which has also been a helpful guide for us in navigating the landscape of climate emotions, is Sarah Jacquette Ray's book *A Field Guide to Climate Anxiety: How to Keep Your Cool on a Warming Planet*. Described as "Gen Z's first 'existential toolkit' for combating eco-guilt and burnout while advocating for climate justice," this book draws on all of the strategies in our framework for promoting adaptation and resilience.[455]

Another book created to help older adolescents and young adults face their fears around climate change is *Facing the Climate Emergency: How to Transform Yourself with Climate Truth* by Margaret Klein Salamon. Described as "a radical self-help guide to become the hero humanity needs," this book draws on activism as a way to overcome the fear, grief, and pain associated with climate change.[456]

For older adolescents and young adults wishing to stay up to date on the latest insights and tools for dealing with climate emotions, there is the Gen Dread newsletter. Gen Dread is authored by Dr. Britt Wray, an author, broadcaster, and researcher who investigates the mental health impacts of the climate crisis and their disproportionate burden on young people.[457] The newsletter, which is released weekly, contains tips for dealing with eco-emotions as well as new research insights and resources for those interested in learning more about climate change and mental health.[458] This offering allows older adolescents and young adults to receive updated resources and education regularly, in a free and highly digestible way.

Social Media

One of the most important roles of social media is its ability to catalyze action among youth. Media has provided youth climate movements with the ability to engage large audiences and inspire them to take action, leading to a large-scale change in behavior among young people.[459] Albert Bandura and Lynne Cherry argue that this behavior change via social media operates through two pathways, direct and socially mediated, shown in Figure 12. Bandura and Cherry describe these pathways as follows: "In the direct pathway, media influences promote changes by informing, enabling, motivating, and guiding viewers to improve their lives. In the socially mediated pathway, media influences are used to link people to social networks and community settings where they receive personalized support and guidance."[460]

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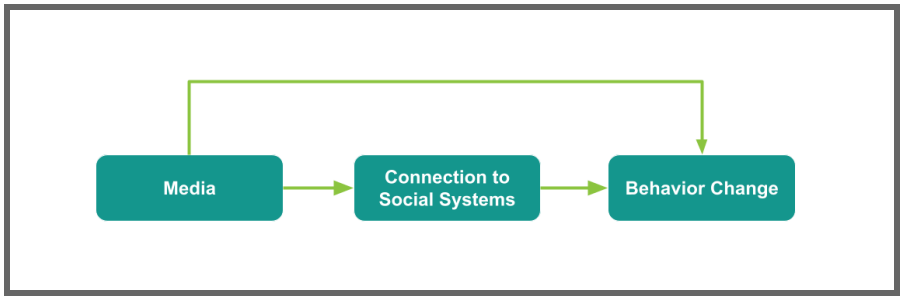
[455] Ray, S. J. (2020). *A field guide to climate anxiety: How to keep your cool on a warming planet*.
[456] Salamon, M. K. (n.d.). *Our Book*. Climate awakening.
[457] Wray, B. (n.d.). *About*. Britt Wray, Ph.D.
[458] Wray, B. (2022). *Gen Dread*. Gen dread.
[459] Bandura, A., & Cherry, L. (2020). Enlisting the power of youth for climate change. *American Psychologist*, *75*(7), 945–951.
[460] Ibid.

Social media is the most commonly-used media source by youth[461,462] as well as an emerging media source used to create, share, and view information related to climate change, climate justice, and the emotions associated with them. A recent Pew Research Center survey found that Gen Z and Millennial-aged individuals interact more with climate change content on social media than older generations.[463]

Though there is little research on the influence of media in regards to climate emotions specifically, these pathways provide some insights into the ways that media can be used to promote positive behavior change and build resilience.

Figure 12. Dual Paths of Influence via Social Media



Adapted from Bandura, A., & Cherry, L. (2020)[464]

There are few resources on social media that provide specific support for climate emotions, and hubs for these kinds of resources are just beginning to develop. There are, however, a variety of young social media influencers working at the nexus of climate change education, climate justice, and climate activism, detailed in Table 4. These young people have an expansive reach of followers with which they share and curate content around the full plethora of climate change-related topics (i.e., social justice, sustainability, activism, extinction, etc.). Many of these individuals have shared information around climate anxiety and other climate emotions.

Some of the individuals highlighted in Table 4 have created communities/groups to share more in-depth information and provide a base for young people looking to be involved in their activist work or learn more about certain topics. For example, Intersectional Environmentalist (IE), a climate justice community and resource hub, was created by founder Leah Thomas to center BIPOC and historically under-amplified voices in the environmental space.[465] IE now consists of a website, workshops, social media, and a podcast run by 16 young people.

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[461] Auxier, B., & Anderson, M. (2021, April 7). *Social media use in 2021*. Pew Research Center.
[462] Statista. (2021, May). *Most popular platforms for daily news consumption in the United States as of May 2021, by age group*.
[463] Thigpen, C. L., & Tyson, A. (2021, June 21). *On social media, Gen Z and Millennial adults interact more with climate change content than older generations*. Pew Research Center.
[464] Bandura, A., & Cherry, L. (2020). Enlisting the power of youth for climate change.
[465] Intersectional Environmentalist. (2022). *About*.

There is also an extremely pertinent, emerging resource hub centered around climate anxiety and other climate emotions called Circularity Community.[466] This group, founded by Sarah Naameh and Kiana Kazemi, is working to make climate justice and climate emotion education accessible to young people and promote strategies for resilience. The team at Circularity Community has developed a website, an interactive guide for environmental advocacy, and guided climate anxiety workshops in Berkeley, CA. The team is currently working to develop an interactive app for young people to work through their climate emotions that will be available for download in January of 2022, and all of their printed guides can be purchased on the Circularity Community website from anywhere in the U.S. This emergent resource hub points to some of the ways that social media can not only inspire action and changes in behavior but also educate and inspire young people experiencing climate emotions.

The emergence of these community hubs provides an opportunity to create space for young people to share, learn, and engage with others with a far-reaching influence. There are opportunities to support the development of these platforms to reach a larger population of young people and to provide these platforms with empirically-based, psychologically-informed information that can be shared widely. Our review of existing media sources and youth climate influencer networks points to the potential for resource hubs and educational platforms to reach large youth audiences and support them in building resilience and other positive behavior changes. The information in Table 4 encapsulates a landscape assessment of the youth climate influencer network that could be accessed to expand the scope of resilience solutions. The table provides names and short descriptions for each influencer along with their scope of influence across different media platforms based on their presence on each platform.

Table 4. Youth climate influence network landscape

Demographic	Information	Youtube	Twitter	TikTok	Instagram
BIPOC & CA-based youth	**Leah Thomas[467] @greengirlleah & @intersectionalenvironmentalist** Founder of Intersectional Environmentalist media platform	✓	✓	✓	✓
	Diandra Marizet @diandramarizet Co-founder and executive director of Intersectional Environmentalist, community builder, writer		✓	✓	✓

[466] Naameh, S., & Kazemi, K. (2021). *About*. Circularity Community.
[467] Green Girl Leah. (2021). *About*.

	Isaias Hernandez[468] **@queerbrownvegan** Creator of QueerBrownVegan, digital creator	✓	✓	✓	✓
	Kiana Kazemi[469] **@kiana.kaz & @circularitycommunity** Creator of Circularity Community				✓
	Jazmine Rogers[470] **@thatcurlytop** BIPOC sustainable fashion and lifestyle influencer	✓		✓	✓
	Youth Vs. Apocalypse[471] **@youthvsapocalypse** Group of climate justice activists working to lift the voices of youth, in particular youth of color.	✓	✓	✓	✓
BIPOC youth	**Joycelyn Longdon**[472] **@climateincolour** UK BIPOC environmentalist	✓	✓		✓
	Doria Brown[473] **@theearthstewardess** Ecotok contributor, TED Countdown Partner			✓	✓
	Wanjiku "Wawa" Gatheru[474] **@blackgirlenvironmentalist** Environmental justice advocate		✓		✓
	Yessenia Funes[475] **@yessfun** Climate editor for Atmos magazine		✓		✓

[468] Queer Brown Vegan. (n.d.) *My story*.
[469] Intersectional Environmentalist. (2021). *Our topic + identity leaders*.
[470] That Curly Top. (2021). *That Curly Top: Sustainable fashion and lifestyle* [YouTube Channel]. YouTube. Retrieved November 12, 2021.
[471] Youth vs Apocalypse. (2021). *About us*.
[472] Climate In Colour. (2021). *About*.
[473] Rosenberg, L. (2021, August 12). *TikTok's earth stewardess, an original member of "EcoTok," shares her "green routine" (exclusive)*. Green Matters.
[474] Wawa Gatheru. (2021). *Meet Wawa*.
[475] Yessenia Funes. (2022). *About*.

Non-BIPOC, non-CA based youth	**Wyn Wiley**[476] **@pattiegonia** Queer environmentalist, drag queen	✓	✓	✓	✓
	Sabs Katz[477] **@sustainablesabs** Sustainability and zero waste influencer	✓			✓
	Sabrina Sustainable Life[478] **@sabrina.sustainable.life** EcoTok Co-Founder	✓		✓	✓
	Alice Aedy[479] **@aliceaedy** founder of Earthrise Studio, documentary photographer, film-maker and activist		✓		✓
	Jack Harries[480] **@jackharries** Founder of Earthrise Studio, film-maker, and climate storyteller/influencer	✓	✓		✓
	EcoTok[481] **@eco.tok & @eco_tok** A collective of environmental educators and activists on TikTok	✓	✓	✓	✓
	Earthrise Studio[482] **@earthrise.studio** Digital platform and creative studio that uses storytelling to communicate the climate crisis	✓	✓		✓

[476] Kennedy, S. (2021, July 16). *A conversation with environmentalist drag queen Pattie Gonia*. Yale Climate Connections.
[477] Katz, S. (n.d.). *Sustainable Sabs: A zero waste journey*. Blindfold.
[478] Sabrina Sustainable Life. (n.d.) *About me*.
[479] Alice Aedy. (2021). *About*.
[480] Jack Harries. (n.d.). *About* [Youtube Channel]. YouTube. Retrieved November 12, 2021.
[481] EcoTok Collective. (2021). *About us*.
[482] Earthrise Studio. (2021). *About*.

Podcasts

Youth-oriented media that discuss climate emotions are emerging and podcasts seem to be a key format addressing climate emotions in youth. There are even a few podcasts dedicated to climate change and mental health. One of these, "WHY?!? A Good Grief Network Podcast,"[483] hosts conversations with experts in climate anxiety, including authors and mental health practitioners. A recent episode featured author and clinician Carolyn Baker discussing emotional resilience strategies, such as examining underlying emotional truths, engaging in physical activity, and taking action. Another notable podcast is "Climate Courage," which dubs itself as a "public health intervention on the air".[484] Episodes combine personal stories about individuals coping with climate change with practical advice on processing emotions, building resilience, connecting with others, and taking action. Episodes also focus on climate justice. Other podcasts on this topic include Sierra Club's "No Place Like Home,"[485] and the Climate Psychology Alliance's "Climate Crisis Conversations: Catastrophe or Transformation."[486]

While little research has been done on the benefits of these podcasts, research has looked at the benefits of podcasts and "self-help media" more generally.[487] Several papers outlining youth benefits of podcast use focused on their application in educational settings[488,489,490,491] and emerging research has found that podcasts can improve wellbeing and learning by activating many parts of the brain[492] and engaging humor.[493] Humor has been found to benefit in the realm of climate change communication more generally.[494] Humor "can be useful to open up spaces of engagement, break taboos or to raise awareness," however, it is important to consider the targeted audience, type, and form of communication, and the risks of using humor (i.e., the use of humor could weaken the credibility of important issues).[495] Research on the use of humor in climate change communication is also emerging, however, some studies point to its potential to stimulate communication and reduce anxiety among viewers/listeners.[496,497]

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[483] Good Grief Network. (n.d.). *Why?!? A Good Grief Network podcast*.
[484] Safe Space Radio. (n.d.). *Climate courage*.
[485] No Place Like Home. (n.d.) *About*.
[486] Climate Psychology Alliance. (2019). *Introduction to our podcasts*.
[487] Chan, S., Li, L., Torous, J., Gratzer, D. & Yellowlees, P. M. (2019). Review and implementation of self-help and automated tools in mental health care. *Psychiatric Clinics of North America*, *42*(4), 597–609.
[488] Hew, K. F. (2009). Use of audio podcast in K-12 and higher education: A review of research topics and methodologies. *Educational Technology Research and Development, 57*(3), 333–357.
[489] Ferrer, I., Lorenzetti, L., & Shaw, J. (2020). Podcasting for social justice: Exploring the potential of experiential and transformative teaching and learning through social work podcasts. *Social Work Education*, *39*(7), 849–865.
[490] Lutkenhaus, R. (2020). *Entertainment-education in the new media landscape: Stimulating creative engagement in online communities for social and behavioral change* [Doctoral dissertation, Erasmus University Rotterdam].
[491] Nigmatullina, A. (2019) The benefits of listening to podcasts. *Scientific Bulletin of Namangan State University, 1*(8).
[492] Pyle, S. (2021, May 13). Listen to a podcast: It's good for your brain! *CASAT OnDemand*.
[493] Smits, I. S. (2021). *Humour and well-being: Exploring the effect of humour on well-being in the podcast Betreutes Fühlen* [Master's thesis, University of Twente].
[494] Kaltenbacher, M., & Drews, S. (2020). An inconvenient joke? A review of humor in climate change communication. *Environmental Communication*, *14*(6), 717–729.
[495] Ibid.
[496] Smits, I. S. (2021). *Humour and well-being: Exploring the effect of humour on well-being in the podcast Betreutes Fühlen* [Master's thesis, University of Twente].
[497] Kaltenbacher, M., & Drews, S. (2020). An inconvenient joke? A review of humor in climate change communication.

Film

There are many films and documentaries about climate change. Most existing films on the subject aim to raise awareness and generate alarm and concern in the public, with the idea that doing so will help motivate individuals to take action to help mitigate the problem. However, a few notable films have taken a unique approach of moving away from fear-based messaging (motivating people with "sticks") to more hopeful, positive messages (motivating with "carrots"). Instead of portraying the hellish landscape that awaits humanity if major changes aren't made, these films flip the message, by helping people to envision a positive future in which humanity has averted worst-case scenarios and has adapted successfully to a climate-changed world.[498]

The first film of note is *A Message from the Future* with Alexandria Ocasio-Cortez, a 7-minute film presented by The Intercept and Naomi Klein, narrated by the congress-woman, and illustrated by Molly Crabapple.[499] Created in 2019 and set several decades in the future, it portrays what the future would look like if the necessary policies and practices were put into place in the U.S. to avoid the worst consequences of climate change and create a future in which humanity is flourishing. It seeks to overcome skepticism about our country's ability to put into place the major changes needed by helping people to envision how it could come about and what it would look like. As Alexandria Ocasio-Cortez narrates at the start of the film, in regards to the Green New Deal, "We knew we needed to save the planet and that we had all the technology we needed to do it, but people were scared. They said it was too big, too fast, not practical. I think that's because they just couldn't picture it yet." The film seeks to help people picture it: a country shaped by Green New Deal policies, including a just transition of jobs, Medicare for all, and an overhaul of the country's energy systems. The result has been called "a vision of radical hope and transformation."[500]

The second film of note is Damon Gameau's 2019 documentary *2040*. Described in the film as an exercise in "fact-based dreaming", the documentary is structured as a letter to his 4-year-old daughter about what the world could look like in 2040 if we put into action the best solutions to many of our environmental challenges. Rather than disseminating images of the apocalyptic future that could await us, the film focuses on envisioning the world we *want* to create — a positive vision of the future. Gameau has emphasized the importance of positive storytelling as an effective means of climate communication. As Gameau has said, "Humans have evolved to tell stories. We have sometimes forgotten this in the environmental space. We have relied too heavily on facts, graphs, and logic to motivate people. I think the way out of our crisis is to tell new stories. Stories that spark the imagination plus create new metaphors, myths, and patterns of meaning for the world we want to create [...] This is the only way change will occur on the scale it is required."[501]

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[498] Futerra Sustainability Communications. 2018. *Sizzle: The new climate message*.
[499] Boekbinder, K. & Batt, J. (Directors). (2019). *A message from the future.* [Film]. The Intercept.
[500] Democracy Now! (2019, April 22). *"A Message from the Future with AOC"*. Pressenza.
[501] Leimbach, T., Kent, J., Walker, J., & Allen, L. (2020). *Staying sane in the face of climate change: A toolkit of emerging ideas to support emotional resilience, mental health and action*.

Opportunities and Future Directions

The consequences of climate change for mental health is a rapidly burgeoning area of research; additionally, resources for supporting climate emotions and promoting resilience are popping up at an increasing rate. However, important gaps remain in both understanding the problem of climate change-related mental health issues and identifying, developing, and implementing the best strategies for addressing the problem and building resilience. Below, we make recommendations for future directions in this field, including suggestions aimed at better understanding the problem of climate anxiety, as well as those focused on identifying, developing, and implementing best practice interventions for promoting resilience.

While many resources for coping with climate anxiety have begun to emerge, recent survey work tells us that the majority of youth continue to suffer and that despair about climate change is escalating. In the realm of intervention work for supporting climate mental health and promoting resilience, much work remains to be done. We need intervention approaches that can meet the needs of individuals experiencing different levels of distress (mild to severe), and which can be applied not only in clinical settings (which are unaffordable, inaccessible, and/or stigmatizing for many groups), but can also be implemented more broadly in the community, in the classroom, and at home. The process involves developing theory-driven interventions based on empirically identified problems and solutions, followed by pilot testing with strong validity. As previously mentioned, only two published interventions to our knowledge have been empirically evaluated to test how effective they are at supporting climate emotions.[502] Evaluation is key for improving interventions and maximizing effectiveness. Evaluation should not just investigate overall effectiveness, but look for potential differences in efficacy in distinct subgroups (e.g., racial/ethnic and age groups). Below are some areas for future work that we consider promising. First, we focus on research opportunities to better understand the problem. Then we discuss educational and preventative measures, such as school- and family-based programs. We next turn to community-based opportunities, such as climate circles, and the need for clinical training to better identify and support individuals with more severe distress and functional impairment. Finally, we discuss the need for a centralized resource hub, a “go-to” website for climate anxiety, where credible information and tools that have been vetted by mental health professionals can be found for supporting climate emotions across a variety of settings.

[502] Baudon, P., & Jachens, L. (2021). A scoping review of interventions for the treatment of eco-anxiety.

Research Opportunities

Based on existing survey work and in particular the recent global Lancet survey,[503] we know that young people are highly concerned about climate change and that these concerns can impact their mental health. However, few studies have examined racial/ethnic differences in climate emotions, or the mental health impacts of climate change awareness within the groups poised to suffer the worst consequences of climate change — in particular, communities of color. Given that there are strong racial/ethnic differences in the impacts of climate change, future work must investigate differences and disparities in how racial/ethnic groups respond psychologically to these impacts.[504] An understanding of such differences is needed to design resources to support the needs of diverse groups and to effectively engage communities of color into the environmental movement from which they have been historically and unjustly excluded.

Research is also needed to identify best practices for communicating climate information to young people (in particular children and adolescents) in age-appropriate ways. Understanding climate change involves a number of brutal truths: entire species are dying off due to human negligence; the planet may soon no longer be hospitable for human life; people around the world, including children, are already suffering intensely and unfairly; and the people in power are doing little to stop it. This knowledge can cause intense emotions and stress; for example, an episode of the Safe Space Radio podcast "Climate Courage" focused on the story of a 9-year-old boy who came home crying inconsolably after learning about the climate crisis in his school; when his mother spoke to him about it, she discovered that he seemed to be having a "crisis of faith in humanity".[505] In young people, whose nervous systems and emotion regulation capacities are still developing, prolonged stress and emotional turmoil have the potential to cause fundamental disruptions in development.[506] This does not mean that young people should be left in the dark about climate change; the realities of climate change are too pervasive to go undetected by young people, and, as previously discussed, ignoring or denying climate change comes with its own set of undesirable consequences. Instead, research is needed to identify ways of communicating climate change information to young people in age-appropriate and emotionally supportive ways. While extensive research exists on climate change communication, little work has investigated the unique needs of young people of different ages and backgrounds for receiving and processing this information. While psychologists and educators (e.g. Caroline Hickman and Harriet Shugarman) have suggested strategies for conducting conversations with young people, these strategies are based on clinical experience and anecdotal evidence and have not been empirically investigated.

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[503] Marks, E. et al. (2021). Young people's voices on climate anxiety, government betrayal and moral injury: A global phenomenon.
[504] Van Nieuwenhuizen, A. et al. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations.
[505] Childs, C (Host). (n.d.) A 9-year-old on fear and grief about climate change [Audio podcast episode]. In *Climate Courage*. Safe Space Radio.
[506] Vergunst, F., & Berry, H. L. (2021). Climate change and children's mental health: A developmental perspective. *Clinical Psychological Science*, 1-19.

School Programs

School-based approaches offer promising means of spreading awareness about the climate crisis in developmentally-appropriate ways, while simultaneously helping students process climate-related emotions and promoting resilience. School curriculums represent a promising intervention strategy, as schools provide reliable access to many young people at once, and hold potential for rapid scalability. As discussed in the "Educational Approaches" section of this report, learning about climate change, while important and necessary, can cause intense emotions that are often not currently acknowledged or addressed by teachers and educators. Climate change information should be taught in an age-appropriate way and accompanied by exercises that explicitly acknowledge students' emotions and provide tools and strategies for coping with these emotions. Climate change education in school offers an important opportunity to help young people begin to develop emotional resilience in the face of the climate crisis.

Some efforts to this end have already begun, such as the recently developed "Climate Anxiety Toolkit" tailored to university students and educators.[507] However, such tools are in the early stages and are specifically tailored to higher education students. Curriculums are needed for high school, middle school, and upper elementary school children. A good starting place for developing such a curriculum for upper elementary and middle school students is Leslie Davenport's previously mentioned book *All the Feelings Under the Sun.* This book provides age-appropriate lessons on climate change coupled with psychologically-informed and kid-friendly exercises for recognizing and processing emotions. This book could be adapted into a curriculum for use in upper elementary and middle school classrooms. Such lessons can be integrated into standard curriculum for maximum scalability, and educators can be trained and empowered to address the emotional impacts of climate change education, as well as to support students directly impacted by climate change.

Family-Based Programs

Child and adolescent responses to climate change cannot be understood outside the context of their parents or caregivers. When young people are aware of climate change and its inherent threats to their current and future well-being, but these threats are ignored, dismissed, or actively avoided by parents/caregivers, this is likely to cause heightened distress and feelings of abandonment in young people. Conversely, when parents are struggling with uncontrolled anxiety and grief around climate change, they may kindle anxiety and distress in their children (T. Doherty, personal communication, September 20, 2021). Thus, addressing the mental health impacts of climate change in youth means, in part, addressing it in their parents and caregivers.

[507] Leimbach, T., et al., (2020). *Staying sane in the face of climate change: A toolkit of emerging ideas to support emotional resilience, mental health and action*.

Family-based interventions are needed. Such interventions can be tailored to support the emotional needs of both parents and their children, and to train parents to initiate conversations with their children and effectively support their difficult emotions around this issue. For example, a program could be developed in which families come together to (1) learn about the science of climate change, (2) provide emotional support to parents and children, (3) discuss positive solutions, including changes that need to occur at a societal level and actions that can be taken at home to reduce a household's impact, and (4) nurture relationships with the natural world. This could be one day in an 8- or 12-week program in which families meet once a week. A sample curriculum for one weekly gathering in this family-based program could involve, for example, (1) learning about the problems involved in traditional agricultural practices and how they contribute to climate change; (2) doing mindfulness exercises to hold space for the emotions this lesson might evoke in both parents and children; (3) learning about the promise of regenerative farming practices for sequestering carbon and reversing climate change; and 4) inviting parents and their children to work side-by-side in a community garden to gain hands-on experience applying these newly-learned principles of regenerative gardening. As with school-based curriculums, family-based programming could be developed from the lessons offered in Leslie Davenport's *All the Feelings Under the Sun,* which provides the educational and emotional components; complimentary hands-on practices could be added.

Community-Based Climate Circles

"Climate circles", put simply, are conversations about climate change. They can be formal or informal, and can vary in terms of audience, content, and logistics. Climate circles have been used to raise awareness about climate change, provide a forum where people can share and discuss their climate change-related emotions and experiences, and identify and plan individual and collective actions to address climate change. One model - the "climate cafe" - is a gathering of people who convene to share and process their feelings about climate change — relieving stressors and increasing their climate change resilience.[508,509,510] Cafes are interactive, typically have a drop-in format, and can be held in-person and online and led by a facilitator or peer.[511]

Climate circles have the potential to scale and can be implemented online or in-person and in communities or within corporations. For example, one multinational technology corporation, Capgemini, adopted and adapted the concept of climate circles and created its own model. At its core, their model is an educational and awareness campaign to "trigger an accelerated response to climate change at every level: corporate, collective, and individual."[512] They have implemented hundreds of climate circles with the goal of normalizing the topic within the company and bringing about the realization that climate change is everyone's issue.[513]

[508] Climate Cafés. (2021). *Climate cafés*.
[509] Climate Psychology Alliance. (2021). *Climate café online*.
[510] Climate and mind. (2021). *Climate circle*.
[511] Ibid.
[512] Meera, S. (October 29, 2021). Climate circles — conversations for a brighter future.
[513] Ibid.

While the potential may be high, little is known about the efficacy and impact of climate circles, and if and how they have been adapted for racial/ethnic groups, age groups, settings, or other contexts. For example, to reach youth and young adults, climate circles could be formed at schools or youth-serving organizations such as the Boys and Girls Club or via social media. Faith-based institutions (e.g., churches), which have been shown to be generally effective for reaching BIPOC populations,[514] may be an option for hosting climate circles as well. Further, while a facilitator or peer typically leads climate circles, the extent to which this individual has been trained or equipped with credible, culturally-tailored resources to support those grappling with various levels of climate distress is also unknown. These "unknowns" provide an opportunity for exploration, greater understanding, and innovation.

Climate Training for Clinicians

If individuals aren't able to develop resilience outside of a clinical setting (from educational, preventative, and community resources) and they end up seeking professional help, they need to be met with expert support. There is currently very little training for clinicians on how to support patients struggling with mental health issues related to climate change. Leslie Davenport has emphasized the need for mental health practitioners to be trained to effectively identify and support patients struggling with strong emotions about the environmental crisis (L. Davenport, personal communication, September 23, 2021). Training and enhanced clinical assessments can help practitioners avoid pathologizing reasonable responses to the climate crisis, while also identifying those struggling with more serious issues that meet criteria for mental health disorders.[515] It can also provide clinicians with techniques tailored to support climate-related mental health issues specifically. Training may also include means of effectively leveraging emotional responses into more productive responses, such as making lifestyle changes and engaging in activism, when appropriate. Davenport has also emphasized the importance of including climate justice education as part of such clinical training (L. Davenport, personal communication, September 23, 2021).

Given the rapid increase in climate anxiety and grief, training methods that can be scaled quickly need to be developed and disseminated.[516] Training and support for mental health professionals may take various forms, including web-based trainings, workshops, communities of practice, and toolkits.[517]

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[514] Thompson, S., & Phillips, D. (2007). Reaching and engaging hard-to-reach populations with a high proportion of nonassociative members. *Qualitative Health Research*, *17*(9), 1292-1303.
[515] Van Nieuwenhuizen, A. et al. (2021). The effects of climate change on child and adolescent mental health: Clinical considerations.
[516] Cunsolo, A., Harper, S. L., Minor, K., Hayes, K., Williams, K. G., & Howard, C. (2020). Ecological grief and anxiety: The start of a healthy response to climate change? *The Lancet Planetary Health*, *4*(7), e261-e263.
[517] Ibid.

Resource Hub

The landscape of existing resources for helping individuals cope with the realities of climate change in a healthy way is quickly expanding. However, existing work is largely siloed, with different groups working independently and at times redundantly. Additionally, existing resources are all over the map. Some are rooted in psychological strategies with proven efficacy for related issues, others are not; help is needed in distinguishing between them, as interventions that are not psychologically informed have the potential to do more harm than good.

What is needed is a central “resource hub”, a website that would serve as a go-to destination for accurate, psychologically-informed, up-to-date climate anxiety information and resources (L. Davenport, personal communication, September 23, 2021). Importantly, resources included in the hub would be vetted by mental health practitioners and experts for quality and use of best practices. Resources could be organized so that various actors seeking information could easily access them (e.g., resources for young people; teachers; parents; community leaders; clinicians). For example, a middle-school teacher looking to teach her students about climate change in an emotionally-sensitive manner that inspires action (rather than paralyzes students with fear) could visit the website and find the section on educational resources, which lists available resources sorted by student grades (e.g., resources for grades K-2; grades 3-5; grades 6-8; etc.). In the “resources for parents” section, a parent could locate best practice information for talking to their child about climate change. In the “resources for community leaders” section, a member of the community could find culturally-sensitive resources for leading effective community support groups.

Conclusion

In this report, we have examined the multiple pathways by which climate change can impact mental health, reviewing evidence on the impacts of acute disasters, as well as more gradual environmental changes, on mental health. We also explored the distress caused by an awareness of climate change, drawing on existing literature to characterize this distress and its prevalence among youth, including BIPOC groups. Additionally, we discussed approaches for addressing climate distress and mental health impacts, and identified existing resources and interventions for supporting youth, with a focus on BIPOC and/or those in California. Finally, we highlighted areas ripe for future work, including addressing gaps in our current knowledge about climate emotions and developing and implementing interventions.