

CLIMATE CHANGE IMPACTS AND CLINICAL COUNSELING

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This article reviews the related literature and summarizes two classification models that enable counselors to understand how climate change may impact mental health and well-being. We discuss the emotional reactivity of climate change through conditions such as eco-anxiety, eco-grief, and solastalgia to prepare counselors for climate-related clinical encounters. Climate-related stressors are not easily categorized yet their impacts may yield existential concerns and be reported by clients. We suggest that counselor advocacy and leadership endeavors are strengthened when informed by clinical knowledge on the mental health repercussions of climate change.

Keywords: eco-anxiety, solastalgia, counselor advocacy, climate change, mental health

Mongonia (2022) issued a call to the counseling profession for increased climate advocacy and leadership, and this timely article overviewed some mental health impacts of climate change, asserting that many are underresearched. We accept the call for increased counselor advocacy around climate change by providing a comprehensive review of the literature, including an overview of models, clinical terms, and conditions that practicing counselors may encounter. We proffer that the counseling profession has a clinical focus. On this premise, we suggest that increased clinical knowledge about the impacts of climate change holds relevance for counselors. Once counselors accumulate clinical knowledge, they can better take up the call for advocacy and leadership as Montagonia recommended. Consequently, this article supports Mongonia's call because clinical knowledge may help with advocacy and leadership.

Considering the destruction and change that climate change may bring across global communities, there is a surprising lack of research in the counseling database. Hilert (2020, 2021) also issued an advocacy call to counselors, highlighted the existential threat that climate change may bring, and accentuated how the impacts disproportionately impact the economically disadvantaged. Peterson and Kozlowski (2024) are formulating a Climate Change Counseling Scale aimed at evaluating counselors' capacity to address mental health challenges arising from climate change. In a national survey, Reese et al. (2023) found a commitment in the counseling profession to address climate change. Still, overall the research is deficient when pairing counseling with climate change, global warming, or ecological influences on mental health. Our goal was to present a review of the relevant interdisciplinary literature in order to raise awareness among counselors of the extent, breadth, and depth of climate change-related mental health effects. The thesis statement of this article is that counselor advocacy and leadership are more impactful when grounded in clinical understanding of how climate change influences mental health.

Two questions guided the structure of this article:

1. What models exist to classify the interface of counseling and climate change-related mental health issues? We wondered if all mental health consequences exist under the broad umbrella of “climate-related impacts” or if a taxonomy exists to better understand what is happening.
2. What should counselors know from the existing literature about the mental health impacts of climate change to prepare for climate-related clinical encounters? As mentioned, we premised that if counselors understand the clinical basis of climate-related impacts, they are in a better position to advocate and assume leadership roles.

Framing the Problem

Research has demonstrated links between climate-related exposures such as heat, drought, wildfires, and floods with many mental health conditions. The exacerbation of existing mental health conditions, psychological distress, higher rates of psychiatric hospitalizations, and heightened self-harm and suicide rates are but a sampling of the myriad adverse mental health impacts of climate change (Charlson et al., 2021). Yet, climate change does not impact all people equally. Marginalized people, including Indigenous populations, bear more significant risks (Manning & Clayton, 2018) in a sinister irony where those who contributed the least to greenhouse gas emissions carry the most risk of negative consequences (Parry et al., 2019). Children also have increased vulnerability and are the age group most likely to worry about climate change (Vergunst & Berry, 2022). As today’s children age, it seems likely that clinicians will see more clients reporting climate-related mental health issues in the future. Counselor advocacy for climate change-related initiatives thus fits with the ethical obligation to promote social justice (American Counseling Association, 2014).

Terminology has evolved to capture the mental health consequences of climate change. The umbrella term *eco-anxiety* refers to the distress associated with heightened awareness of climate change and its implications for the future (Baudon & Jachens, 2021; Coffey et al., 2021). The related term of *ecological-grief* speaks to the felt loss in response to real or anticipated losses in the natural world (Coffey et al., 2021; Cunsolo & Ellis, 2018). *Solastalgia* refers to the associations between human and ecosystem health (Galway et al., 2019) and relates to the distress experienced by people when their valued natural environments are degraded and negatively transformed (Doherty & Clayton, 2011; Galway et al., 2019).

A considerable portion of research investigating the clinical ramifications of climate change relies on data obtained through self-report measures from participants. Researchers commonly administer surveys, ask participants to maintain distress diaries for subsequent analysis, or employ Q methodology. Still within clinical settings, individuals may disclose feelings of anxiety or depression stemming from climate-related concerns or actively seek assistance for such issues (Budziszewska & Jonsson, 2022). Consequently, counselors may encounter clients coming to counseling specifically due to climate-related stress, allowing for direct addressing of the matter. Alternatively, counselors can explore current events or existential themes during sessions as a means of gauging potential climate-related distress in clients who may not overtly address it themselves.

Considering the burgeoning reach and influence of climate change on mental health, researchers have sought to classify the negative consequences. Doherty and Clayton (2011) described three classes of psychological impacts related to climate change. *Direct* impacts relate to acute or traumatic effects brought on by extreme weather events, the effects of which could be

vast and include posttraumatic stress disorder, major depression, substance abuse, and elevated risks of child abuse (Clayton, 2021; Palinkas & Wong, 2020). In the case of direct impacts, symptoms shown by clients are traced explicitly to the weather event. *Indirect* or vicarious impacts refer to emotional responses based on hearing and seeing examples of environmental devastation in the media. Although dependent on values, beliefs, and experiences, common emotions include guilt, worry, and despair with the psychological defense of denial often employed to reduce distress (Clayton, 2020). Relatedly, people may display apathy towards climate change, which may reflect a type of paralysis in the face of a seemingly insurmountable problem (Lertzman, 2012). Finally, *psychosocial* impacts refer to how climate change impacts social and community relationships such as through displacement and relocation, changes in agriculture, or economic consequences. The psychosocial impacts of climate change also involve community conflicts as people adjust and compete for limited resources after a natural disaster.

A Model for Conceptualization

Berry et al. (2010) developed a model to conceptualize mental health impacts stemming from specific events with four categories of impacts along two axes. Acute and subacute impacts refer to the nature of the catalyzing event with acute events referring to discrete events with definitive start and endpoints. Examples of acute events are fires or a hurricane. Subacute events are ongoing such as a drought, generally elevated temperatures, or poor air quality. Categorizing events and mental health impacts is challenging as events can have components that fall into multiple categories. Table 1 presents the interface of acute and subacute, direct and indirect, and primary and secondary implications of climate change.

Table 1

Impacts and Their Primary and Secondary Clinical Implications

	Acute	Subacute
	Direct Impacts	
Experience	Physical danger	Long term health danger
Primary	Trauma	Adverse experiences
Secondary	Trauma response	Trauma/adjustment response
	Indirect Impacts	
Experience	Responses to physical damage	Responses to lifestyle changes
Primary	Physical adjustment	Personal adjustment
Secondary	Adjustment response, grief	Adjustment response

Direct Acute and Subacute Impacts

Direct impacts resulting from subacute climate change events are those that threaten the physical health and safety of individuals in the long term (Berry et al., 2010). These types of impacts such as warmer weather and increased frequency of drought directly threaten the health and safety of individuals over time and likely manifest in prolonged adverse experiences. Temperature fluctuations in the tropics are linked with negative agricultural, economic, and political consequences (Bathiany et al., 2018), the mental health implications of which are likely high. Drought alone has been linked to negative mental health effects such as depression, demoralization, helplessness, and suicide (Cianconi et al., 2020; Gronlund et al., 2019).

The Impacts of Heat on Mental Health

The direct biological implications of climate change can be acute in the sense of a major weather event or extreme heat and subacute in the case of drought. Scientists have predicted that the frequency and severity of heatwaves and hot extremes will increase due to climate change (Intergovernmental Panel on Climate Change Working Group, 2021). The impacts of heat on mental health and psychological well-being are well documented. Heat can impact mental health directly by altering the efficacy of psychiatric medicines, affecting neurophysiological signaling and, therefore, cognition, and causing disruptions in sleep patterns (Cedeño Laurent et al., 2018; Hancock & Vasmatzidis, 2003; Lohmus, 2018). Seasonal affective disorder, known as winter depression and typically characterized by the onset of depression in the winter months, can occur in the summer (Melrose, 2015) and existing mental health conditions may be exacerbated by intense and prolonged heat. Some research has suggested that heat can trigger bipolar relapses (Montes et al., 2021). Increased heat is also linked to higher suicide rates in the United States and Mexico (Burke et al., 2018) and an increased incidence of visits to the emergency room (Nori-Sarma et al., 2022).

Trauma and Climate Change

The definition of trauma includes threatened death and serious injury to self or others (American Psychiatric Association, 2013). Exposure to trauma includes directly experiencing the traumatic event or witnessing the event as it occurred to others. Research has suggested an increase in posttraumatic stress symptoms following major weather events (Cruz et al., 2020; Ironson et al., 2014; Rataj et al., 2016). Children are especially vulnerable to posttraumatic stress which, if left untreated, can disrupt their developmental trajectory (Le Roux & Cobham, 2021). The roles of school counselors make them effective advocates and helpers for children dealing with trauma, and they are advised to cultivate proficiency in trauma-informed strategies (Nice et al., 2022). School counselors have a longstanding and pivotal role in crisis prevention and intervention (Morris et al., 2021).

People have been subjected to acute trauma from natural disasters throughout history, but the relentlessness of climate change risks the formation of chronic trauma or prolonged distressing and traumatic events (Mascari et al., 2022) thus widening climate-related trauma to include an intergenerational aspect (Bednarek, 2021). As the numbers of traumatized individuals due to climate change increases, more human service providers may be required to treat them. Therefore,

the number of people experiencing vicarious trauma and secondary traumatic stress as well as compassion fatigue and burnout may increase (Kim et al., 2022).

Counseling services provided both before and following a major weather event can lower the risk of posttraumatic stress disorder. Counselors can educate clients on positive coping skills following exposure to a major weather event. For example, counselors can facilitate a social support network, which is a protective factor that works against the onset of a mental health disorder or can prevent its exacerbation (Gordon-Hollingsworth et al., 2018; McGuire et al., 2018; Platt et al., 2016).

Indirect Acute and Subacute Impacts

Acute environmental stressors may indirectly impact mental health through individual responses to the secondary impacts of these events. The events themselves can inflict severe damage to homes and physical infrastructure and inflict injury to people. The losses associated with these impacts are connected to elevated rates of mood disorders and increased anxiety (Rataj et al., 2016). These types of impacts may qualify as traumatic because they can pose a threat to the physical well-being of individuals even when not directly caused by the event like in the case of a home that collapses following a major weather event.

The most widespread impacts from climate change events are considered indirect and subacute. These impacts include the vast and innumerable changes that occur on secondary levels and include physical health impacts, loss of livelihoods, social and political unrest, forced migration, and disruption of social networks (Intergovernmental Panel on Climate Change Working Group, 2021). There is also evidence of climate-related events contributing to increased human conflict such as domestic violence, violent crimes, and crime between groups that includes civil conflict and political instability (Hsiang et al., 2013). Indirect impacts have been linked to elevated rates of chronic mood disorders along with suicidal ideation and attempts (Cianconi et al., 2020; Hayes et al., 2018; McGuire et al., 2018).

Emotional Reactivity and Climate Change

Climate change can elicit mental health effects that are not easily categorized. Sometimes existing independently of any identifiable triggering event, these negative mental health experiences are reactions to the concept of climate change itself and the existential questions that it raises. Although their impacts are well documented, limited research exists that considers the relationships between the constructs and effective mental health treatment.

Eco-anxiety

Eco-anxiety has become a popular term across media and interdisciplinary research but has not found a consistent definition (Panu, 2020). The term represents any manifestation of fear and worries tied to the uncertainty or troubling nature of the concept of climate change. Eco-anxiety may include panic attacks, rumination, insomnia, and appetite changes caused by environmental concerns (Clayton, 2020). The key feature of eco-anxiety is that it stems from a response to perceived environmental doom or worsening environmental conditions (Albrecht, 2011).

Most forms of eco-anxiety are nonclinical (Panu, 2020), and indeed, the term is not listed in the Diagnostic and Statistical Manual of Mental Disorders or International Classification of

Diseases. Eco-anxiety may be habitual but is generally unrelated to pathological worry (Verplanken et al., 2020), and this is key feature differentiating eco-anxiety from many diagnosable anxiety-related conditions. For example, the defining characteristics of generalized-anxiety disorder such as the worry being excessive, unremitting, very challenging to control, and accompanied by other cognitive or physical symptoms are examples of pathological worry (Handley et al., 2014).

Baudon and Jachens (2021) used a scoping review method to identify eco-anxiety intervention options and recommendations. They concluded that five major themes emerge from the literature: fostering the inner resilience of clients, helping clients find social and emotional support by joining groups, encouraging clients to take action, helping clients self-explore and self-educate on the topic of climate change, and connecting clients with nature. Additionally, counselors can consider the diverse array of evidence-based treatments for anxiety as starting points for treating the corollary experience of eco-anxiety (Baker, 2013; Baudon & Jachens, 2021). Depending on the specific fears of their clients, counselors can assess the degree to which the fear causes impairment in the client's life. Appropriate treatments may connect with concepts such as existential anxiety and death anxiety for clients with more existential concerns regarding climate change (Baudon & Jachens, 2021). Exploring clients' experience with media consumption regarding climate change may also be worthwhile as media exposure may exacerbate symptoms (Maran & Begotti, 2021).

Solastalgia

While the concept of eco-anxiety broadly refers to stress or distress caused by environmental changes, solastalgia looks at the pain explicitly caused by the transformation and degradation of a person's home environment (Albrecht, 2005; Galway et al., 2019; Kumar et al., 2021; Usher et al., 2019). The concept of home varies widely from a plot of land to the whole of Earth. The cultural importance of the idea of home is critical in conceptualizing treatment for those experiencing solastalgia. Solastalgia may encompass more than just an individual's mental and emotional health, depending on how home is perceived. Solastalgia also includes the spiritual health impacts of climate change as people are forced to reconceptualize their understanding of home. In some cultures, those of Indigenous people notably, the natural and spiritual systems are interwoven (Galway et al., 2019). Cultures with a close connection to physical spaces may find the degradation to their home environments particularly distressing. Counselors should consider each person's and culture's unique relationship of their home environment to be a culturally sensitive, climate change-informed counselor.

Solastalgia is sometimes associated with Indigenous cultures as many Indigenous people derive a sense of personal and cultural identity from their relationships with the land, nonhuman beings, and water (Galway et al., 2019; Martin, 2012). Solastalgia feelings are often compounded in Indigenous peoples because of a past that witnessed their lands colonized and ruined by other peoples. The traumas of the past combined with the environmental changes of the present make Indigenous people especially vulnerable to solastalgia (Comtesse et al., 2021; Sakakibara et al., 2020). Important to note is that some controversy surrounds whether or not the use of the term solastalgia is appropriate to Indigenous peoples. Criticism has been leveled because non-Indigenous people developed the word solastalgia, and many Indigenous-developed concepts may better describe similar experiences (Galway et al., 2019; Martin, 2012). The debate remains on

whether or not solastalgia is a concept that should be used to describe the experiences of Indigenous people while the term remains in frequent use.

Ecological Grief

Ecological grief and solastalgia are related concepts. While solastalgia refers to the pain associated with the change to one's home landscape due to climate change, ecological grief focuses specifically on the impact of loss. Ecological grief includes three variations of loss: (a) grief associated with physical losses such as of land, ecosystems, and species; (b) disruptions to environmental knowledge and loss of identity; and (c) anticipated future losses (Cunsolo & Ellis, 2018).

Grief in general is an adaptive response to loss because it aids in emotional processing and informs necessary adaptation (Comtesse et al., 2021). Ecological grief risks becoming pathological when it causes distress over a long period, occurs regularly, and compounds loss. Yet, regardless of severity, counseling can help alleviate the pain of grief (Neimeyer & Currier, 2009). As with eco-anxiety, clients experiencing ecological grief may be facing existential anxiety and death anxiety in the face of their losses. By understanding the nature of a client's grief, counselors can better direct treatment and evaluate other disorders stemming from their loss such as depression (Zhang et al., 2006). Table 2 pairs the conceptual impacts of climate change with their clinical corollaries and provides treatment considerations.

Table 2

Conceptual Impacts of Climate Change, Clinical Corollaries, and Treatment Considerations

	Corollary	Treatment	Considerations
Eco-Anxiety	Anxiety	EBT for anxiety	Assess rationality, consider existential anxiety, death anxiety, and anxiety stemming from media consumption
Solastalgia	Adjustment	EBT for adjustment, EBT for symptoms of anxiety or depression	Explore cultural factors and relationship to concept of home
Ecological Greif	Bereavement	EBT for bereavement, EBT for symptoms of anxiety or depression	Consider existential anxiety, death anxiety, understand object of grief

Additional Emotional Reactions

The rumination of climate change can generate various emotional reactions (Doherty & Clayton, 2011). The reactions are often not caused by a specific climate change-related event but rather are a response to climate change's diffuse, ever-present nature (Baudon & Jachens, 2021). Therefore, these responses may present clinically and should be considered relevant to climate change-informed counselors.

Guilt and Shame

Guilt and accompanying shame arise for some people who feel complicit in the development of global warming. Guilt and shame can wreak havoc on mental health and are linked to depression (Webb et al., 2007). Within the context of climate change, guilt and shame can motivate people to act for environmental justice (Baek & Yoon, 2017), and organizations have used guilt and shame-inducing messaging to provoke action (Tam, 2019). Conversely, guilt and shame can manifest in the phenomena of *ecoparalysis* or feeling overwhelmed by the scope of climate change and rendering oneself unable to take effective action accordingly (Hayes et al., 2018). Ecoparalysis represents a significant challenge in mitigating climate change through individual action. Overall, guilt and shame are unproductive emotional conditions, more likely to lead to overwork and burnout than productive long-term environmental action.

Eco-Reproductive Concerns

Eco-reproductive concerns regard how people factor climate change into their reproductive choices (Schneider-Mayerson & Leong, 2020). Some research suggests that concerns about the environment are correlated with decreased intentions to have children (Arnocky et al., 2012). One survey found that young Americans are increasingly factoring climate change into their reproductive decisions because they fear climate change may negatively impact their children and worry about the carbon footprint of bringing a child into the world (Schneider-Mayerson & Leong, 2020). More research is needed to assess the pervasiveness of eco-reproductive concerns. Still, climate change-conscious counselors should consider the possibility that eco-reproductive concerns present in clinical situations.

Culture and Climate Change

Some groups are especially vulnerable to the impact of climate change such as children, the elderly, persons with disabilities, the peripartum population, individuals with mental illness, immigrant groups, and those of lower socioeconomic status (Berry et al., 2010; Cianconi et al., 2020). Historical inequality because of race, ethnicity, and religion has been tied with socioeconomics and must be considered in mental health impacts. Also important is whether the client adopts an individualistic or collectivist worldview. Clients with individualist worldviews situate problems within themselves whereas those with a collectivist worldview, emphasizing the idea of an interdependent self, are apt to view problems within a systemic and cultural context (Lewis et al., 2022). Research in individualistic and collectivist orientations, climate change action, and mental health is limited. However, one study in China found that people with an individualistic orientation are more likely to view climate change as intractable and less likely to take climate-

friendly action (Xiang et al., 2019). Cultural variables influence how climate change affects people and their response to it though more research is needed to examine the issue in more detail.

Climate Change Denial

A growing number of studies have aimed to understand the factors influencing individuals' attitudes towards climate change. Several studies have explored the role of social identities, efficacy beliefs, and personality traits in predicting climate change denial or acceptance. For instance, Kiral Ucar et al. (2023) investigated how different social identities and efficacy beliefs predict climate change denial and pro-environmental engagements. Their findings revealed that global identities were significant predictors of climate change denial. Similarly, Nicol et al. (2022) explored the relationship between climate change denial and benevolent and hostile sexism, highlighting the intersectionality of these factors in understanding individuals' attitudes towards environmental issues.

In addition to social identities and attitudes, individual characteristics such as personality traits have also been examined in relation to climate change denial. Gibbon and Douglas (2021) utilized the Big Five Aspect Scale and environmental concepts to examine the interplay between personality traits, attitudes, behavior, and climate change denial. Their study aimed to identify the underlying factors contributing to individuals' likelihood of being climate change deniers or accepters. Their findings suggest that lower cognitive ability predicts climate change denial. Furthermore, Nartova-Bochaver et al. (2022) investigated the influence of environmental identity and individualism/collectivism on climate change denial across nine countries. Despite the variability in societal types and environmental outlook, their results indicated weak associations between these factors and climate change denial. Their results do suggest that women deny climate change less than men. These studies collectively contribute to our understanding of the multifaceted nature of climate change denial and the various factors influencing individuals' attitudes towards environmental issues.

Discussion

The purpose of this article was to review the related literature regarding how climate change impacts mental health. We sought to identify existing models that classify the interface of counseling and climate change. We discussed two models: one by Doherty and Clayton (2011) and another by Berry et al. (2010). Therefore, our first research question is answered in the affirmative. Models do exist and they address the class of impact (e.g., direct, indirect) and the nature of the catalyzing event (e.g., acute, subacute). We addressed our second research question by highlighting commonly addressed mental health-related phenomena related to climate change in the literature such as eco-anxiety and solastalgia. Taken together, our findings indicate that literature exists to inform counselors of climate change-related mental health impacts, and the models can explain the impacts with nuance.

Implications: The Need for Advocacy

Advocacy is a cornerstone of the counseling profession yet organized advocacy efforts around climate change are lacking in the field. A strong ethics case can be made that counselors have an ethical obligation to advocate and provide leadership on issues related to climate change

(Mongonia, 2022). While counselors may interpret the ethical code differently, an escalating climate crisis almost certainly provides a potential barrier and obstacle to the growth and development of many people. This article was grounded in the premise that counseling is a clinical-focused profession, and therefore clinical knowledge about climate change will help with advocacy efforts. We presented models, terminology, and relevant research to further Mongonia's (2022) call to action. Our aspiration is that this article prompts further exploration at the intersection of counseling, advocacy, and climate change through subsequent research.

It is crucial that counselors engage in advocacy around climate change for four reasons. First, advocacy allows counselors to help in maintaining the well-being of their clientele amid escalating environmental concerns such as heightened anxiety, depression, and trauma resulting from climate-related stressors. Second, advocacy can organize preventive and proactive measures to combating climate change, aligning with the ethical principles of nonmaleficence and beneficence. Third, advocacy can contribute to community resilience by addressing psychosocial repercussions of climate change thereby fostering social cohesion; such advocacy inherently acknowledges the intersectionality of climate change impacts, underscoring disparities and inequities disproportionately affecting marginalized populations. Lastly, to the extent that counselors serve as guardians of public well-being, they are ethically bound to advocate for climate action from a social justice perspective. In sum, advocacy is essential for counselors when it comes to climate change because it directly impacts their clients' well-being, supports prevention and mitigation efforts, fosters community resilience, and aligns with their professional responsibilities.

Suggestions for Future Research

Many areas of study remain unexplored in the broad area of mental health and climate change. More research is needed to explore how constructs like eco-anxiety, solastalgia, ecological grief, and ecoparalysis manifest and impact diverse individuals and cultures. Developing psychometrically sound assessment instruments of these constructs would allow counselors to better understand their impact. A more thorough understanding of these constructs may point to more efficacious treatments, allowing for more informed treatment plans for clients with climate change-induced mental health challenges. Counselors are well served to work towards a climate change-informed orientation for counseling research, clinical utility, and ethics. Specifically, research can examine the effectiveness of counseling interventions to treat specific conditions (e.g., eco-anxiety) among different populations such as vulnerable communities or individuals with preexisting mental health conditions. Research can also explore the role of counselor education and training in preparing mental health professionals to effectively address climate-related distress and trauma within clinical practice. Finally, longitudinal studies can investigate the long-term mental health effects of climate change and the effectiveness of interventions over time. Taken together, a growing body of research can help develop evidence-based strategies to treat the consequences of climate change. The overarching goal of future research should be to enhance clinical practice concerning stressors linked to climate change with the potential to also influence policy making and counselor education.

Conclusion

This article suggests that advocacy is heightened when counselors have a clinical understanding of how climate change influences mental health. In response to calls for increased counselor

advocacy and leadership regarding climate change, this article provides a comprehensive review of the literature to underscore the urgent need for counselor engagement in addressing climate-related mental health impacts. Specific mental health consequences of climate-related stressors such as trauma, eco-anxiety, and solastalgia were examined. Despite growing recognition of climate change as an existential threat, research within the counseling field remains deficient, highlighting the necessity for increased awareness and action.

References

- Albrecht, G. (2005). 'Solastalgia'. A new concept in health and identity. *PAN: Philosophy Activism Nature*, 3, 41–55.
- Albrecht, G. (2011). Chronic environmental change: Emerging 'psychoterratic' syndromes. In I. Weissbecker (Ed.), *Climate change and human well-being: Global challenges and opportunities* (pp. 43–56). Springer.
- American Counseling Association. (2014). *ACA code of ethics*. <https://www.counseling.org/resources/aca-code-of-ethics.pdf>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Arnocky, S., Dupuis, D., & Stroink, M. L. (2012). Environmental concern and fertility intentions among Canadian university students. *Population and Environment*, 34(2), 279–292. <https://doi.org/10.1007/s11111-011-0164-y>
- Baek, T. H., & Yoon, S. (2017). Guilt and shame: Environmental message framing effects. *Journal of Advertising*, 46(3), 440–453. <https://doi.org/10.1080/00913367.2017.1321069>
- Baker, J. (2013). What have we done to mother Earth? Psychodynamic thinking applied to our current world crisis. *Psychodynamic Practice*, 19(1), 55–67.
- Bathiany, S., Dakos, V., Scheffer, M., & Lenton, T. (2018). Climate models predict increasing temperature variability in poor countries. *Science Advances*, 4(5), Article eaar5809. <https://doi.org/10.1126/sciadv.aar5809>
- 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), Article 9636. <https://doi.org/10.3390/ijerph18189636>
- Bednarek, S. (2021). Climate change, fragmentation and collective trauma. Bridging the divided stories we live by. *Journal of Social Work Practice*, 35(1), 5–17.
- Berry, H., Bowen, K., & Kjellstrom, T. (2010). Climate change and mental health: A causal pathways framework. *International Journal of Public Health*, 55(2), 123–132. <https://doi.org/10.1007/s00038-009-0112-0>
- Budziszewska, M., & Jonsson, S. E. (2022). Talking about climate change and eco-anxiety in psychotherapy: A qualitative analysis of patients' experiences. *Psychotherapy*, 59(4), 606–615. <https://doi.org/10.1037/pst0000449>
- Burke, M., González, F., Baylis, P., Heft-Neal, S., Baysan, C., Basu, S., & Hsiang, S. (2018). Higher temperatures increase suicide rates in the United States and Mexico. *Nature Climate Change*, 8(8), 723–729.
- Cedeño Laurent, J. G., Williams, A., Oulhote, Y., Zanobetti, A., Allen, J. G., & Spengler, J. D. (2018). Reduced cognitive function during a heat wave among residents of non-air-conditioned buildings: An observational study of young adults in the summer of 2016. *PLoS Medicine*, 15(7), Article e1002605. <https://doi.org/10.1371/journal.pmed.1002605>

- Charlson, F., Ali, S., Benmarhnia, T., Pearl, M., Massazza, A., Augustinavicius, J., & Scott, J. G. (2021). Climate change and mental health: A scoping review. *International Journal of Environmental Research and Public Health*, *18*(9), Article 4486.
- Cianconi, P., Betrò, S., & Janiri, L. (2020). The impact of climate change on mental health: A systematic descriptive review. *Frontiers in Psychiatry*, *11*, 74–74. <https://doi.org/10.3389/fpsy.2020.00074>
- Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, *74*, Article 102263. <https://doi.org/10.1016/j.janxdis.2020.102263>
- Clayton, S. (2021). Climate change and mental health. *Current Environmental Health Reports*, *8*(1), 1–6.
- 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*, Article 100047.
- Comtesse, H., Ertl, V., Hengst, S., Rosner, R., & Smid, G. (2021). Ecological grief as a response to environmental change: A mental health risk or functional response? *International Journal of Environmental Research and Public Health*, *18*(2), Article 734. <https://doi.org/10.3390/ijerph18020734>
- Cruz, J., White, P. C. L., Bell, A., & Coventry, P. A. (2020). Effect of extreme weather events on mental health: A narrative synthesis and meta-analysis for the UK. *International Journal of Environmental Research and Public Health*, *17*(22), Article 8581. <https://doi.org/10.3390/ijerph17228581>
- Cunsolo, A., & Ellis, N. (2018). Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*, *8*(4), 275–281. <https://doi.org/10.1038/s41558-018-0092-2>
- Doherty, T. J., & Clayton, S. (2011). The psychological impacts of global climate change. *American Psychologist*, *66*(4), 265–276. <https://doi.org/10.1037/a0023141>
- Galway, L. P., Beery, T., Jones-Casey, K., & Tasala, K. (2019). Mapping the solastalgia literature: A scoping review study. *International Journal of Environmental Research and Public Health*, *16*(15), Article 2662. <https://doi.org/10.3390/ijerph16152662>
- Gibbon, E., & Douglas, H. E. (2021). Personality and the pro-environmental individual: Unpacking the interplay between attitudes, behaviour and climate change denial. *Personality and Individual Differences*, *181*, Article 111031. <https://doi.org/10.1016/j.paid.2021.111031>
- Gordon-Hollingsworth, A. T., Yao, N., Chen, H., Qian, M., & Chen, S. (2018). Understanding the impact of natural disasters on psychological outcomes in youth from mainland China: A meta-analysis of risk and protective factors for post-traumatic stress disorder symptoms. *Journal of Child & Adolescent Trauma*, *11*(2), 205–226. <https://doi.org/10.1007/s40653-015-0051-2>
- Gronlund, C. L., Shea, C., & O'Neill, M. S. (2019). Assessing the magnitude and uncertainties of the burden of selected diseases attributable to extreme heat and extreme precipitation under a climate change scenario in Michigan for the period 2041–2070. *Environmental Health*, *18*(1), 40–17. <https://doi.org/10.1186/s12940-019-0483-5>
- Hancock, P. A., & Vasmatazidis, I. (2003). Effects of heat stress on cognitive performance: The current state of knowledge. *International Journal of Hyperthermia*, *19*(3), 355–372. <https://doi.org/10.1080/0265673021000054630>

- Handley, A. K., Egan, S. J., Kane, R. T., & Rees, C. S. (2014). The relationships between perfectionism, pathological worry and generalised anxiety disorder. *BMC Psychiatry, 14*(1), 1–8.
- Hayes, K., Blashki, G., Wiseman, J., Burke, S., & Reifels, L. (2018). Climate change and mental health: Risks, impacts and priority actions. *International Journal of Mental Health Systems, 12*(1), 28–28. <https://doi.org/10.1186/s13033-018-0210-6>
- Hilert, A. J. (2020). Climate change and the international context of counseling. *Journal of Asia Pacific Counseling, 10*(1).
- Hilert, A. J. (2021). Counseling in the anthropocene: Addressing social justice amid climate change. *Journal of Multicultural Counseling and Development, 49*(3), 175–191.
- Hsiang, S. M., Burke, M., & Miguel, E. (2013). Quantifying the influence of climate on human conflict. *Science, 341*(6151), Article 1235367. <https://doi.org/10.1126/science.1235367>
- Intergovernmental Panel on Climate Change Working Group. (2021). *Climate change 2021: The physical science basis*. Cambridge University Press.
- Ironson, G., Kumar, M., Greenwood, D., Schneiderman, N., Cruess, D., Kelsch, C. B., Wynings, C., Wellens, R., Benight, C., Burnett, K., Fernandez, J. B., & Baum, A. (2014). Posttraumatic stress symptoms, intrusive thoughts, and disruption are longitudinally related to elevated cortisol and catecholamines following a major hurricane. *Journal of Applied Biobehavioral Research, 19*(1), 24–52. <https://doi.org/10.1111/jabr.12014>
- Kim, J., Chesworth, B., Franchino-Olsen, H., & Macy, R. J. (2021). A scoping review of vicarious trauma interventions for service providers working with people who have experienced traumatic events. *Trauma, Violence, & Abuse, 23*(5), 1437–1460 <https://doi.org/10.1177/1524838021991310>
- Kiral Ucar, G., Gezici Yalcin, M., Özdemir Planali, G., & Reese, G. (2023). Social identities, climate change denial, and efficacy beliefs as predictors of pro-environmental engagements. *Journal of Environmental Psychology, 91*, 1–9. <https://doi.org/10.1016/j.jenvp.2023.102144>
- Kumar, P., Kumar, N., & Sarthi, P. P. (2021). Feeling solastalgia: A study of the effects of changing climate in rural India. *Asian Journal of Social Psychology, 24*(2), 208–220. <https://doi.org/10.1111/ajsp.12473>
- Le Roux, I. H., & Cobham, V. E. (2021). Psychological interventions for children experiencing PTSD after exposure to a natural disaster: A scoping review. *Clinical Child and Family Psychology Review, 25*, 249–282. <https://doi.org/10.1007/s10567-021-00373-1>
- Lertzman, R. A. (2012). The myth of apathy: Psychoanalytic explorations of environmental subjectivity. In S. Weintrobe (Ed.), *Engaging with climate change* (pp. 117–133). Routledge.
- Lewis, J., Jackson, D., Hassan, A. (2022). Collectivism and counseling: A framework for culturally responsive contextual counseling. In R. Fulmer (Ed.), *Counseling and psychotherapy: Theory and beyond* (pp. 226–253). Cognella.
- Lohmus, M. (2018). Possible biological mechanisms linking mental health and heat—A contemplative review. *International Journal of Environmental Research and Public Health, 15*(7), Article 1515. <https://doi.org/10.3390/ijerph15071515>
- Manning, C., & Clayton, S. (2018). Threats to mental health and wellbeing associated with climate change. In S. Clayton & C. Manning (Eds.), *Psychology and climate change* (pp. 217–244). Academic Press.

- Maran, D. A., & Begotti, T. (2021). Media exposure to climate change, anxiety, and efficacy beliefs in a sample of Italian university students. *International Journal of Environmental Research and Public Health*, 18(17), Article 9358. <https://doi.org/10.3390/ijerph18179358>
- Martin, D. H. (2012). Two-eyed seeing: A framework for understanding indigenous and non-indigenous approaches to indigenous health research. *Canadian Journal of Nursing Research*, 44(2), 20–42. <https://cjunr.archive.mcgill.ca/issue/view/226>
- Mascari, J. B., Webber, J., Green, D., & Widener, A. (2022). Trauma-informed counseling. In R. Fulmer (Ed.), *Counseling and psychotherapy: Theory and beyond* (pp. 311–341). Cognella.
- 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. <https://doi.org/10.1002/jts.22270>
- Melrose, S. (2015). Seasonal affective disorder: An overview of assessment and treatment approaches. *Depression Research and Treatment*, 2015, Article 178564. <https://doi.org/10.1155/2015/178564>
- Mongonia, L. (2022). Climate change and mental health: The counseling professional's role. *Journal of Counselor Leadership and Advocacy*, 9(1), 57–70.
- Montes, J. M., Serrano, C., & Pascual-Sanchez, A. (2021). The influence of weather on the course of bipolar disorder: A systematic review. *The European Journal of Psychiatry*, 35(4), 261–273.
- Morris, C. A. W., Wester, K. L., Jones, C. T., & Fantahun, S. (2021). School counselors and unified educator–counselor identity: A data-informed approach to suicide prevention. *Professional School Counseling*, 24(1_part_3). <https://doi.org/10.1177/2156759X211011909>
- Nartova-Bochaver, S. K., Donat, M., Kiral Ucar, G., Korneev, A. A., Heidmets, M. E., Kamble, S., Khachatryan, N., Kryazh, I. V., Larionow, P., Rodríguez-González, D., Serobyanyan, A., Zhou, C., & Clayton, S. (2022). The role of environmental identity and individualism/collectivism in predicting climate change denial: Evidence from nine countries. *Journal of Environmental Psychology*, 84, 1–11. <https://doi.org/10.1016/j.jenvp.2022.101899>
- Neimeyer, R. A., & Currier, J. M. (2009). Grief therapy: Evidence of efficacy and emerging directions. *Current Directions in Psychological Science*, 18(6), 352–356. <https://doi.org/10.1111/j.1467-8721.2009.01666.x>
- Nice, M. L., Forziat-Pytel, K., Benoit, C., & Sturm, D. C. (2022). School counselor and environmental educator partnerships: Reducing eco-anxiety from climate change, increasing self-efficacy, and enhancing youth advocacy. *Professional School Counseling*, 26(1). <https://doi.org/10.1177/2156759X221090525>
- Nicol, A. A. M., De France, K., & Mayrand Nicol, A. (2022). The relation of climate change denial with benevolent and hostile sexism. *Journal of Applied Social Psychology*, 52(9), 823–836. <https://doi.org/10.1111/jasp.12880>
- Nori-Sarma, A., Sun, S., Sun, Y., Spangler, K. R., Oblath, R., Galea, S., Gradus, J. L., & Wellenius, G. A. (2022). Association between ambient heat and risk of emergency department visits for mental health among US adults, 2010 to 2019. *JAMA Psychiatry*, 79(4), 341–349. <https://doi.org/10.1001/jamapsychiatry.2021.4369>

- Palinkas, L. A., & Wong, M. (2020). Global climate change and mental health. *Current Opinion in Psychology, 32*, 12–16.
- Panu, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability, 12*(19), Article 7836. <https://doi.org/10.3390/su12197836>
- Parry, L., Radel, C., Adamo, S. B., Clark, N., Counterman, M., Flores-Yeffal, N., Pons, D., Romero-Lankao, P., & Vargo, J. (2019). The (in) visible health risks of climate change. *Social Science & Medicine, 241*, Article 112448. <https://doi.org/10.1016/j.socscimed.2019.112448>
- Peterson, G. H., & Kozlowski, M. B. (2024). Development and initial validation of the climate change counseling scale. *Measurement and Evaluation in Counseling and Development, 1–21*. <https://doi.org/10.1080/07481756.2024.2303461>
- Platt, J. M., Lowe, S. R., Galea, S., Norris, F. H., & Koenen, K. C. (2016). A longitudinal study of the bidirectional relationship between social support and posttraumatic stress following a natural disaster. *Journal of Traumatic Stress, 29*(3), 205–213. <https://doi.org/10.1002/jts.22092>
- Rataj, E., Kunzweiler, K., & Garthus-Niegel, S. (2016). Extreme weather events in developing countries and related injuries and mental health disorders - A systematic review. *BMC Public Health, 16*(1), Article 1020. <https://doi.org/10.1186/s12889-016-3692-7>
- Reese, R. F., Swank, J. M., & Sturm, D. C. (2023). A national survey of helping professionals on climate change and counseling. *The Journal of Humanistic Counseling, 62*(3), 201–215.
- Sakakibara, C., Horensky, E., & Garelick, S. (2020). Indigenous peoples and climate change: Humanistic explorations of cultural resilience. *Environmental Philosophy, 17*(1), 75–92. <https://doi.org/10.5840/envirophil202011792>
- Schneider-Mayerson, M., & Leong, K. L. (2020). Eco-reproductive concerns in the age of climate change. *Climatic Change, 163*(2), 1007–1023. <https://doi.org/10.1007/s10584-020-02923-y>
- Tam, K.-P. (2019). Anthropomorphism of nature, environmental guilt, and pro-environmental behavior. *Sustainability, 11*(19), Article 5430. <https://doi.org/10.3390/su11195430>
- Usher, K., Durkin, J., & Bhullar, N. (2019). Eco-anxiety: How thinking about climate change-related environmental decline is affecting our mental health. *International Journal of Mental Health Nursing, 28*(6), 1233–1234. <https://doi.org/10.1111/inm.12673>
- Webb, M., Heisler, D., Call, S., Chickering, S. A., & Colburn, T. A. (2007). Shame, guilt, symptoms of depression, and reported history of psychological maltreatment. *Child Abuse & Neglect, 31*(11), 1143–1153. <https://doi.org/10.1016/j.chiabu.2007.09.003>
- Vergunst, F., & Berry, H. L. (2022). Climate change and children’s mental health: A developmental perspective. *Clinical Psychological Science, 10*(4), 767–785.
- Verplanken, B., Marks, E., & Dobromir, A. I. (2020). On the nature of eco-anxiety: How constructive or unconstructive is habitual worry about global warming? *Journal of Environmental Psychology, 72*, Article 101528. <https://doi.org/10.1016/j.jenvp.2020.101528>
- Xiang, P., Zhang, H., Geng, L., Zhou, K., & Wu, Y. (2019). Individualist–collectivist differences in climate change inaction: The role of perceived intractability. *Frontiers in Psychology, 10*, Article 187.
- Zhang, B., El-Jawahri, A., & Prigerson, H. G. (2006). Update on bereavement research: Evidence-based guidelines for the diagnosis and treatment of complicated bereavement. *Journal of Palliative Medicine, 9*(5), 1188–1203. <https://doi.org/10.1089/jpm.2006.9.1188>