

# PSYCHOLOGISTS FOR SOCIAL RESPONSIBILITY

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## **Climate Change and Mental Health: Evidence for Action Psychologists for Social Responsibility Climate Change, Sustainability, and Psychology Program**

### **OVERVIEW**

Climate change will have significant effects not only in far flung places but also in the United States, including more severe heat waves, damaging storms, droughts, crop-growing changes, and worsening of the air quality. All of these effects will increase the risks for untoward mental health outcomes for millions of people.

What follows is a brief list of relevant articles describing some of these psychological and behavioral risks, grouped according to the category of effect. Each article is prefaced with a brief description of its main point. Please note that these articles don't necessarily speak to climate change's implications in specific but instead are indicative of what we can expect in a warmer world.

A final section describes links to resources for up-to-date and non-politicized information about climate change and its implications.

### **HEAT**

- **Higher temperatures are associated with increased rates of assault, rape, robbery, burglary, and larceny but not murder, and this might be the result of more people being outside interacting in the community when the temperatures are higher. Murder tends to occur more inside homes.**

Rotton, J., & Cohn, E. G. (2003). Global warming and U.S. crime rates: An application of routine activity theory. *Environment and Behavior*, 35, 802-825.

- **Violent crime may be exacerbated during heat waves because more stress hormones are released when people are exposed to excessive heat.**

Simister, J., & Cooper, C. (2004). Thermal stress in the U.S.A.: Effects on violence and on employee behavior. *Stress and Health*, 21, 3-15.

- **More alcohol and drugs may be consumed during heat waves, and more people may seek help for their psychiatric problems during these periods.**

Bulbena, A., Sperry, L., & Cunillera, J. (2006). Psychiatric effects of heat waves. *Psychiatric Services*, 57, 1519.

- **Work performance declines as temperatures rise, so climate change is likely to reduce the world's economic output.**

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Hübler, M., Klepper, G., & Peterso, S. (2008). Costs of climate change: The effects of rising temperatures on health and productivity in Germany. *Ecological Economics*, 68, 381-393.

- **Apart from heat, such behavioral and situational factors as poverty and isolation contribute to more deaths during heat waves.**

Poumadère, M., Mays, C., Le Mer, S., & Blong, R. (2005). The 2003 heat wave in France: Dangerous climate change here and now. *Risk Analysis*, 25, 1483-1494.

## WATER

- **Drought appears to contribute to a variety of mental health effects, including more stress, grief, and hopelessness as well a sense of *solastalgia*, which describes a palpable sense of dislocation and loss people feel when they perceive changes to their local environment are pervasively harmful.**

Sartore, G. M., Kelly, B., Stain, H., Albrecht, G., & Higginbotham, N. (2008). Control, uncertainty, and expectations for the future: A qualitative study of the impact of drought on a rural Australian community. *Rural & Remote Health*, 8, 950. Available from [http://www.rrh.org.au/publishedarticles/article\\_print\\_950.pdf](http://www.rrh.org.au/publishedarticles/article_print_950.pdf)

Sartore, G., Kelly, B., & Stain, H. J. (2007). Drought and its effect on mental health—how GPs can help. *Australian Family Physician*, 36, 990-993.

- **Higher rates of anxiety and emotional distress may be one result of experiencing drought.**

Coêlho, A., Adair, J., & Mocellin, J. (2004). Psychological responses to drought in northeastern Brazil. *Revista Interamericana de Psicología*, 38, 95-103.

- **Drought appears to create increased anxiety and stress among farmers, problems in their family relationships, and risks for suicide.**

Chand, P. K., & Murthy, P. (2008). Climate change and mental health. *Regional Health Forum*, 12, 43-48.

## FOOD

- **Climate change will affect food supplies around the world, and research indicates inadequate nutrition is associated with more developmental and behavioral problems in children as well as lower IQs.**

Tanner, E. M., & Finn-Stevenson, M. (2002). Nutrition and brain development: Social policy implications. *American Journal of Orthopsychiatry*, 72, 182-193.

Wachs, T. D. (2000). Nutritional deficits and behavioral development. *International Journal of Behavioral Development*, 24, 435-441.

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- **Inadequate access to food resources also increases the risk for serious psychological and coping problems.**

Lee, Y., Lee, M. K., Chun, K. H., Lee, Y. K., & Yoon, S.J. (2001). Trauma experience of North Korean refugees in China. *American Journal of Preventive Medicine*, 20, 225-229.

Yu, S., & Hannum, E. (2007). Food for thought: Poverty, family nutritional environment, and children's educational performance in rural China. *Sociological Perspectives*, 50, 53-77.

- **Climate change will exacerbate one of the primary reasons for malnutrition, namely socioeconomic disadvantage.**

Bohle, H. G., Downing, T. E., & Watts, M. J. (1994). Climate change and social vulnerability: Toward a sociology and geography of food Insecurity. *Global Environmental Change*, 4, 37-48.

- **Food insecurity—the lack of access to sufficient food for good health and mental functioning—and water shortages may be traumatizing to people, resulting in more anxiety, post-traumatic stress, and depression as well as more violence toward women.**

Chilton, M., & Booth, S. (2007). Hunger of the body and hunger of the mind: African American women's perceptions of food insecurity, health and violence. *Journal of Nutrition Education and Behavior*, 39, 116-125.

Lee, Y., Lee, M. K., Chun, K. H., Lee, Y. K., & Yoon, S. J. (2001). Trauma experience of North Korean refugees in China. *American Journal of Preventive Medicine*, 20, 225-229.

## AIR

- **More air pollution is a hallmark of climate change's higher temperatures, and people perceive themselves to be less well when exposed to more air pollution.**

Yamazaki, S., Nitta, H., & Fukuhara, S. (2006). Associations between exposure to ambient photochemical oxidants and the vitality or mental health domain of the health related quality of life. *Journal of Epidemiology & Community Health*, 60, 173-179.

- **Air pollution both causes and exacerbates asthma, and children who experience asthma (34 million Americans have asthma, and the rates are increasing) are at least two times more likely to have anxiety symptoms, almost twice as likely to be depressed, and report my general psychological distress.**

Katon, W., Lozano, P., Russo, J., McCauley, E., Richardson, L., & Bush, T. (2007). The prevalence of DSM-IV anxiety and depressive disorders in youth with asthma compared with controls. *Journal of Adolescent Health*, 41, 455-463.

- **Higher levels of ozone, and air pollutant that will become more prevalent with climate change, are associated with increased rates of family violence.**

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Rotton, J., & Frey, J. (1985). Air pollution, weather, and violent crimes: Concomitant time-series analysis of archival data. *Journal of Personality and Social Psychology*, 49, 1207-1220.

- **People who perceive their air quality to be worse feel more depressed.**

Jacobs, S., Evans, G., Catalano, R., & Dooley, D. (1984). Air pollution and depressive symptomatology: Exploratory analyses of intervening psychosocial factors. *Population & Environment: Behavioral & Social Issues*, 7, 260-272.

- **People experience more anxiety and tension when they live near industrial air pollutants, which will be exacerbated in climate change's warmer temperatures.**

Chattopadhyay, P., Som, B., & Mukhopadhyay, P. (1995). Air pollution and health hazards in human subjects: Physiological and self-report indices. *Journal of Environmental Psychology*, 15, 327-331.

- **Air pollution from traffic, a major contributor to climate change and something climate change will make worse, may deepen or contribute to higher rates of schizophrenia.**

Pedersen, C., Raaschou-Nielsen, O., Hertel, O., & Mortensen, P. (2004). Air pollution from traffic and schizophrenia risk. *Schizophrenia Research*, 66, 83-85.

## CATAclysmic Events

- **Conflict among people may be one of the hallmarks of climate change's severe weather, which can displace thousands or millions and lead to those people competing with others for scarce resources.**

Abbott, C. (2008). *An uncertain future: Law enforcement, national security, and climate change*. London: Oxford Research Group.

- **While many people have short-term reactions to extreme natural disasters—including grief, anger, anxiety, and depression—persistent post-traumatic stress may be the hallmark of climate change, as was demonstrated after Hurricane Katrina.**

Galea, S., Brewin, C. R., Gruber, M., Jones, R. T., King, D. W., King, L. A., et al. (2007). Exposure to hurricane-related stressors and mental illness after Hurricane Katrina. *Archives of General Psychiatry*, 64, 1427-1434.

Morrissey, S. A., & Reser, J. P. (2007). Natural disasters, climate change and mental health considerations for rural Australia. *Australia Journal of Rural Health*, 15, 120-125.

- **One study showed that mental illness doubled after Hurricane Katrina.**

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Kessler, R. C., Galea, S., Jones, R. T., & Parker, H. A. (2006). Hurricane Katrina Community Advisory Group. Mental illness and suicidality after Hurricane Katrina. *Bulletin of the World Health Organization*, 84, 930-939.

- **One year after Hurricane Katrina, exposed children were four times more likely than before the storm to be depressed or anxious and twice as likely to have behavioral problems.**

Abramson, D., Garfield, R., & Redlener, I. (2007). *The recovery divide: Poverty and the widening gap among Mississippi children and families affected by Hurricane Katrina*. Columbia University, New York: Mailman School of Public Health. Available from [http://www.ncdp.mailman.columbia.edu/files/recovery\\_divide.pdf](http://www.ncdp.mailman.columbia.edu/files/recovery_divide.pdf)

- **Other psychological problems, including family dysfunction, difficulties at work, increased child misbehavior, a sense of lost identity, and more may result from experiences of the extreme disasters that climate change is likely to bring.**

Bourque, L. B., Siegel, J. M., Kano, M., & Wood, M. M. (2006). Weathering the storm: The impact of hurricanes on physical and mental health. *Annals of the American Academy of Political and Social Science*, 604, 129-150.

Kessler, R. C., Galea, S., Gruber, M. J., Sampson, N. A., Ursano, R. J., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry*, 13, 374-384.

Weisler, R. H., Barbee, J. G., & Townsend, M. H. (2006). Mental health and recovery in the Gulf Coast after Hurricanes Katrina and Rita. *Journal of the American Medical Association*, 296, 585-588.

- **Climate change will bring more droughts, fires, and other natural disasters to some regions, and these will more significantly harm the psychological well-being of citizens thereby requiring better preparedness to deter the worst outcomes.**

Morrissey, S. A., & Reser, J. P. (2007). Natural disasters, climate change, and mental health considerations for rural Australia. *Australian Journal of Rural Health*, 15, 120-125.

- **Climatic variability also will be common with climate change, and the unpredictability of storms, floods, droughts, and other extreme events will tax many people's ability to cope.**

Tarhule, A. (2005). Damaging rainfall and flooding: The other Sahel hazards. *Climatic Change*, 72, 355-377.

- **Emotional distress and anxiety will be among the hallmarks of climate change and its effects, and disadvantaged communities are among those to be most harmed.**

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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. Available from <http://www.ijmhs.com/content/pdf/1752-4458-2-13.pdf>

## INFECTIOUS DISEASE

- **While currently there is but conjecture that more infectious diseases will be a likely outcome of climate change, research on the SARS epidemic found people responded with enormous anxiety, post-traumatic stress, and depression.**

Ko, C., Yen, C., Yen, J., & Yang, M. (2006). Psychosocial impact among the public of the Severe Acute Respiratory Syndrome epidemic in Taiwan. *Psychiatry and Clinical Neurosciences*, 60, 397-403.

Lee, A. M., Wong, J. G. W. S., McAlonan, G. M., Cheung, V., Cheung, C., Sham, P. C., et al. (2007). Stress and psychological distress among SARS survivors 1 year after the outbreak. *The Canadian Journal of Psychiatry*, 52, 233-240.

- **Children can experience intense, delayed anxiety in response to outbreaks of infectious disease, especially when they're anxious to begin with.**

Nagao, K., Okuno, M., & Shindou, E. (2001). Mental symptoms induced by a massive outbreak of infectious disease (Enterhemorrhagic Escherichia Coli 0157) in elementary school children: II. Six cases of delayed and reactivated stress-related disorders, including PTSD. *Japanese Journal of Child and Adolescent Psychiatry*, 42, 315-322.

- **Many infectious diseases themselves can cause psychological symptoms—some lasting—including harming children's thinking and lucidity, academic performance, attention and memory, and speech-language skills.**

Boivin, M. J. (2002). Effects of early cerebral malaria on cognitive ability in Senegalese children. *Journal of Developmental & Behavioral Pediatrics*, 23, 353-364.

Carter, J. A., Murira, G. M., Ross, A. J., Mung'ala-Odera, V., & Newton, C. R. J. C. (2003). Speech and language sequelae of severe malaria in Kenyan children. *Brain Injury*, 17, 217-224.

Carter, J. A., Mung'ala-Odera, V., Neville, B. G. R., Murira, G., Mturi, N., Musumba, C., et al. (2005). Persistent neurocognitive impairments associated with Aevere Falciparum malaria in Kenyan children. *Journal of Neurology, Neurosurgery & Psychiatry*, 76, 476-481.

Haaland, K. Y., Sadek, J., Pergam, S., Echevarria, L. A., Davis, L. E., Goade, D., et al. (2006). Mental status after West Nile Virus infection. *Emerging Infectious Diseases*, 12, 1260-1262.

Olness, K. (2003). Effects on brain development leading to cognitive impairment: A worldwide epidemic. *Journal of Developmental & Behavioral Pediatrics*, 24, 120-130.

Pancharoen, C., & Thisyakorn, U. (2001). Neurological manifestations in dengue patients. *Southeast Asian Journal of Tropical Medicine and Public Health*, 32, 341-345.

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- **Nongovernmental organizations that intervene after disease epidemics and other natural disasters don't often launch what could be helpful mental health programs in response.**

Sanchez, S. H., & Katz, C. L. (2006). International disaster mental health services: A survey. *Psychiatric Services, 57*, 420-421.

## ARTICLES AND BOOKS CONCERNING PSYCHOLOGY AND CLIMATE CHANGE

Amel, E. L., Manning, C. M., & Scott, B. A. (2009). Mindfulness and sustainable behavior: Pondering attention and awareness as means for increasing green behavior. *Ecopsychology, 1*, 14-25.

Cornforth, S. C. (2008). Life's span, global warming and ethics: Do counselors have a part to play in averting a potential catastrophe? *International Journal of Advanced Counseling, 30*, 145-154.

Crompton, T., & Kasser, T. (2009). *Meeting environmental challenges: The role of human identity*. Devon, England: Green Books.

Gifford, R. (2008). Psychology's essential role in alleviating the impacts of climate change. *Canadian Psychology, 49*, 273-280.

Hollander, N. (2009). When not knowing allies with destructiveness: Global warning and psychoanalytic ethical non-neutrality. *International Journal of Applied Psychoanalytic Studies, 6*, 1-11.

Howard, G. S. (2000). Adapting human lifestyles for the 21<sup>st</sup> Century. *American Psychologist, 55*, 509-515.

Howard, G. (1997). *Ecological psychology: Creating a more earth-friendly human nature*. Notre Dame, IN: University of Notre Dame Press.

Howard, G. (1993). Ecocounseling psychology: An introduction and overview. *The Counseling Psychologist, 21*, 550-559.

Kasser, T. (2009). Shifting values in response to climate change. In World Watch Institute (Eds.), *State of the World 2009: Into a warmer world* (pp. 122-125). New York: W. W. Norton.

Kasser, T., & Kanner, A. (2004). Where is the psychology of consumer culture? *Psychology and consumer culture: The struggle for a good life in a materialistic world* (pp. 3-7). Washington, DC: American Psychological Association.

Kazdin, A. (2009). Psychological science's contributions to a sustainable environment: Extending our reach to a grand challenge of society. *American Psychologist, 64*, 339-356.

Moser, S. C., & Dilling, L. (2007). *Creating a climate for change: Communicating climate change and facilitating social change*. New York: Cambridge University Press.

Oskamp, S. (2007). Applying psychology to help save the world: Reflections on a career in psychology. *Analyses of Social Issues and Public Policy, 7*, 121-136.

Oskamp, S. (2000). Psychological contributions to achieving an ecologically sustainable future for humanity. *Journal of Social Issues, 56*, 373—390.

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- Oskamp, S. (2000). A sustainable future for humanity? How can psychology help? *American Psychologist*, 55, 496-508.
- Parker, C. L., & Shapiro, S. M. (2008). *Climate chaos: Your health at risk*. Westport, CT: Praeger.
- Spence, A., Pidgeon, N., & Uzzell, D. (2009). Climate change – psychology’s contribution. *The Psychologist*, 22, 108-111.
- Stern, P. C. (2000). Psychology and the science of human-environment interactions. *American Psychologist*, 55, 523-530.
- Vlek, C. (2000). Essential psychology for environmental policy making. *International Journal of Psychology*, 35, 153-167.
- Winter, D. (2000). Some big ideas for some big problems. *American Psychologist*, 55, 516-522.

## CLIMATE CHANGE DATA AND INFORMATION WEB SITES

- **National Oceanic and Atmospheric Administration: National Climatic Data Center:** <http://www.ncdc.noaa.gov/oa/climate/globalwarming.html>
- **Intergovernmental Panel on Climate Change:** <http://www.ipcc.ch/>
- **World Bank: Climate Change:** <http://beta.worldbank.org/climatechange/>
- **United Nations Development Programme:** <http://hdr.undp.org/en/>
- **U.S. Environmental Protection Agency:** <http://www.epa.gov/climatechange/>
- **Real Climate:** [www.realclimate.org/](http://www.realclimate.org/)