

## Direct from CDC

### Environmental Health Services Branch

Martin A. Kalis, M.A.  
CAPT Mark D. Miller, M.P.H., R.S.  
Rachel J. Wilson

# Public Health and Drought

*Editor's note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the Journal.*

*In this column, EHSB and guest authors from across CDC will highlight a variety of concerns, opportunities, challenges, and successes that we all share in environmental public health. EHSB's objective is to strengthen the role of state, local, and national environmental health programs and professionals to anticipate, identify, and respond to adverse environmental exposures and the consequences of these exposures for human health. The services being developed through EHSB include access to topical, relevant, and scientific information; consultation; and assistance to environmental health specialists, sanitarians, and environmental health professionals and practitioners.*

*The conclusions in this article are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.*

*Martin A. Kalis is a public health advisor for emergency preparedness and response in EHSB. He is also the vice chair of NEHA's Terrorism and All-Hazards Preparedness Technical Section. CAPT Mark Miller is a senior environmental health officer in EHSB. He is also the coordinator for CDC's Environmental Health Training in Emergency Response (EHTER). Rachel Wilson is a freelance medical writer and editor who is working with EHSB to draft When Every Drop Counts: Protecting Public Health During Drought Conditions—A Guide for Public Health Professionals.*

**A**t the most basic conceptual level, drought is a natural phenomenon in which levels of rainfall or other types of precipitation are lower than average for an extended period of time, resulting in inadequate water supply. To truly understand drought and its effect on people and the environment, including human health impacts, one must also consider differences in geographic regions, local water demand, and variables such as a community's ability to adapt to water shortages and state and local policies that regulate water supply ([www.drought.unl.edu](http://www.drought.unl.edu)). For instance, a significant amount of annual rainfall in the southwestern U.S could be considered a drought in the Northwest. The photo at the top of page 11 illustrates recent conditions in the southeastern United States. As a readily available supply of safe water is a prerequisite for public health, droughts have potential public health significance and understanding the relationship between the two is an important first step in examining potential associations.

### The Need for Guidance

Although many aspects of drought have been well researched, particularly in the developing world, how drought affects public health needs further study. The Environmental Health Services Branch (EHSB) at the Centers for Disease Control and Prevention (CDC) recently reviewed existing drought-related literature and information. In its review, EHSB found that although limited data on drought exists as it pertains to public health, no consolidated scientific

evidence or guidance was available to help public health officials and practitioners prepare for drought at the local, state, and national levels. As a result, public health experts have been operating with only limited guidance about drought preparedness and with an inadequate understanding about how water shortages can affect the health of their communities.

### A Helpful Resource

To meet this need, EHSB and a host of partners, including the U.S. Environmental Protection Agency (U.S. EPA) and the American Water Works Association (AWWA), are collaboratively creating a guide for public health and other professionals concerned with the health implications of drought. Several key processes are being used to create this document. In addition to the extensive review of existing drought-related public health information and literature, EHSB has organized a working group of subject matter experts from diverse fields, including all levels of public health, environmental health and quality, agriculture, and water-related sciences. The working group, along with other partners, participated in a three-day workshop to

- identify and prioritize drought-related public health issues,
- discuss research gaps and needs in the area of public health as they relate to drought,
- develop recommendations,
- identify steps to ensure that the U.S. public health system is better prepared for drought, and
- share personal experiences of drought within their regions (see photo on page 11, center).

The resulting guidance document, *When Every Drop Counts: Protecting Public Health During Drought Conditions—A Guide for Public Health Professionals*, is scheduled to be released in fall 2009 and will

- provide guidance and information about how water shortages affect public health,
- recommend steps to help mitigate the health effects of drought,
- identify future needs for research,
- provide a list of resources and tools, and
- provide examples of best practices and lessons learned.

### Some Interesting Findings


This collaborative effort addresses many possible public health implications of drought, including compromised quantity and quality of potable water, increased recreational risks, effects on air quality, diminished living conditions, compromised food and nutrition, and increased incidence of illness and disease. For example, prolonged or severe drought conditions can negatively affect air quality because of increased particulates suspended in the air (e.g., pollen and fluorocarbons) (see photo bottom right). Subsequent wildfires can irritate the bronchial passages and lungs, thereby exacerbating chronic respiratory illnesses and increasing the risk for acute respiratory infection (e.g., bronchitis and pneumonia). Risk for certain infectious diseases such as coccidioidomycosis, which are transmitted through aerosolization of spores in soil, also increases with drought.

Decreased rainfall can also cause both groundwater and surface water to become polluted with a variety of contaminants, including those that cause acute infectious

disease. The incidence of certain vector-borne diseases can occur when drought diminishes the size of water bodies and causes them to stagnate, providing optimal breeding sites for certain types of mosquitoes. Lack of visible surface water also affects the breeding behavior of mosquitoes by forcing them to breed in cryptic sites found underneath raised tree hummocks in stands of hardwoods normally associated with swamp or bog ecosystems, which are home to many species of birds and other types of wildlife. This convergence of mosquito vectors and avian hosts during drought events has been associated with outbreaks of certain diseases, including St. Louis encephalitis, Eastern equine encephalitis, and West Nile virus.

### Conclusion

CDC's guidance document on public health and drought is an important step in providing public health officials and practitioners with much needed guidance and information on this emerging area of concern. Increased research on drought and its effects on public health will lead to the continued development and implementation of evidence-based policies, strategies, and practices that can be used to better prepare communities for the implications of drought on public health.

*Corresponding Author:* Martin A. Kalis, Public Health Advisor, Environmental Health Services Branch, Division of Emergency and Environmental Health Services, National Center for Environmental Health, Centers for Disease Control and Prevention, 4770 Buford Highway, N.E., M.S. F-60, Atlanta, GA 30341-3724. E-mail: [mkalis@cdc.gov](mailto:mkalis@cdc.gov) 



*Lake Lanier, Georgia (December 2007). Several states in the southeastern part of the United States have experienced prolonged drought conditions during the last few years. Photo courtesy of NWS/NOAA.*



*Public Health Effects of Drought Workshop held September 2008 in Atlanta, sponsored by CDC, U.S. EPA, and AWWA. Photo courtesy of CDC.*



*Oklahoma "Dust Bowl" during the 1930s. Many people contracted dust pneumonia throughout the Great Plains states during this time, although verification of official death rates is difficult to find. Photo courtesy of NRCS/USDA.*



**Address changes take approximately two months to become effective. To ensure that you don't miss a single issue of the *Journal*, please notify us as soon as possible of your new address.**

# Thanks!