Create a Climate Kit

Overview

With an ever-changing workplace environment, incidents of severe weather are happening more frequently. Additionally, new hazards are present in the workplace that we all need to be attentive to in order to maintain a safe workplace.

Objectives

- Recognize new workplace hazards due to an ever-changing climate
- Identify protective measures you can use to reduce exposure to climate hazards

Background

The earth, and therefore our workplace, is undergoing changes. The average ambient temperature continues to be on the rise. The most recent Intergovernmental Panel on Climate Change (IPCC) reports that heat waves, heavy precipitation events, and other weather extremes have become more frequent and intense in recent decades. Additionally, the IPCC has identified some evidence of actual human health effects directly affected by climate change (e.g., heat stress, death, or injury in floods and storms) and indirectly through changes in the ranges of disease carrying organisms (mosquitos, ticks). How is the health and safety of you, the worker, being influenced by our ever-changing climate?

Increased Ambient Temperatures

While many may argue the root cause of the increase in temperatures, the fact remains that it is occurring and places workers at greater risk to their health and safety. While the ambient temperature increases, the human body needs to react to compensate for the warmer environment. We are experiencing more days of hotter temperatures and in longer duration. These changes lead to increased health effects. Workers may suffer from increases in heat exhaustion, stress, and stroke. Workers may become fatigued

easier leading to impaired judgment and overall loss of agility while working around hazardous equipment. Furthermore, when the body is subjected to heat extremes, it manages this by sweating. While this is a worthy physiological response to protect the body, having our skin warm and moist increases our susceptibility to chemicals that may be present. The warm moist skin more readily absorbs many hazardous chemicals that normally would pose less or no harm.

Work-related factors such as work practices, work/rest cycles, access to water, and access to shade/cooling and other controls can affect the safety of the worker. Workers need to be aware of these hazards and find measures to reduce their exposure and protect themselves while working in these temperature extremes. Measures that can be taken include the control measures listed earlier, such as cooling areas or shade, and ensuring access to water through water coolers, bottles, or backpack reservoirs. Additionally, wearing lightweight/ breathable and light-colored clothing can assist in keeping the worker cool while in this environment.

Extreme cold also impedes workers. Cold can slow motion and reaction time and impair judgement.

Planning for either weather extreme is important to safeguard health and safety.

Increased Air Pollution

Common sources are often responsible for the emissions of both greenhouse gases that influence global warming and air pollutants that have direct health effects on people. Elevated temperatures can increase levels of air pollution, which in turn can further harm human health. For example, high temperatures also raise the levels of ozone and other air pollutants, such as particulate matter, that worsen cardiovascular and respiratory diseases.

Outdoor activities such as transportation, utility maintenance, landscaping, and construction lead to longer exposures to air pollutants due to the amount of time spent outside and exposed to these pollutants. Additionally, a recent study suggested that the increased length and severity of pollen season; more frequent, heavy precipitation events; and severe urban air pollution episodes are strong risk factors for respiratory allergic disease. Increased asthma prevalence in the general population can be expected to translate to increased workers with asthma, and for these individuals, exposure to respiratory irritants creates great health concern.

Workers need to be attentive to the air quality reports and may seek to alter work schedules and duties to better suited times of the day to reduce exposure. Furthermore, workers with pre-existing respiratory disorders need to take additional action to be

attentive to the environment they are working in and may consider transferring to other areas of work that reduce their exposure to these health risks.

Increased UV Radiation

Our ever-changing climate causes a disruption in the clouds and affects the amount of UV radiation that reaches the earth's surface. Additionally, decreases in our earth's protective ozone layer may also increase UV radiation levels, thereby increasing ozone related health effects. Globally, excessive solar UV radiation exposure caused the loss of 1.5 million disability-adjusted life years and 60,000 premature deaths in the year 2000. Outdoor workers may be at greater risk of adverse eye effects from UV radiation. There is evidence that UV radiation increases the risk of several eye diseases including cataracts and cancers of the eye. Workers can protect themselves by limiting exposure through protective shading of sunglasses.

Similarly, UV radiation may increase the risk of skin cancer in outdoor workers. There is sufficient evidence that can justify categorizing UV radiation as a carcinogen. Individuals with light skin, hair, and eye color are at elevated risk. Workers can protect themselves by wearing long pants and sleeved shirts, brimmed hats, and a suitable sunscreen that is water-resistant and carries a high SPF rating.

Increased Extreme Weather

Extremes like floods, drought, landslides and storms are becoming more frequent and intense in recent decades with temperature and climate change. The impact of some recent severe events has displayed that even modern, high-income regions are not immune to the wrath of these storms. While present, these severe events create dynamic, high-hazard environments; once over, these events then create additional, unique risk to workers that are engaged at putting our nation's infrastructure back in place.

Workers need to be attentive to these events and seek adequate shelter while the event is occurring. Once the event has passed and clean up begins, utility hazards from disrupted electrical systems, septic systems, and flammable gas systems create new hazards.

Expanded Habitat

The warming temperatures make it possible for many insects, snakes and animals to survive in new areas of the country. This expanding habitat poses risks that may not be anticipated.

Increased Vector-Borne Diseases

Changing temperatures can affect vector (mosquito, flea, tick) pathogen and host habitats. Shifting temperature and rainfall patterns increase the potential of infectious diseases such as malaria and dengue fever. Increasing ambient temperature has affected the reproduction rates of ticks and mosquitoes.

Outdoor workers are at great risk of vector-borne diseases transmitted by the bite of an infected insect. For example, malaria and Zika (see https://www.osha.gov/Publications/OSHA3855.pdf) are spread by mosquitos; tick-borne diseases include Colorado tick fever, Powassan encephalitis, Q fever and Lyme disease. The adult black-legged tick commonly called a deer tick and the carrier of Lyme disease is difficult to see--about the size of a sesame seed; other adult ticks are larger (see https://www.cdc.gov/ticks/life_cycle_and_hosts.html). Many types of ticks are common in the region.

Mosquito-borne illnesses such as West Nile virus, St. Louis encephalitis, Eastern Equine Encephalitis (Triple EEE), Western Equine encephalitis, and dengue, malaria, and La Crosse encephalitis can be fatal in humans.

Workers can protect themselves by wearing long pants and long-sleeved shirts of light color; the light color allows for easier detection of mosquitoes/ticks. If ticks are possible in the work area thoroughly look at your skin at the end of the workday to identify any that may be attached; remove ticks and wash thoroughly according to CDC recommendations, https://www.cdc.gov/ticks/removing_a_tick.html; if a rash or fever appears within several weeks after the removal, see a physician.

Insect repellants such as DEET and/or Permethrin may be used to reduce the likelihood of a vector bite. Lastly, being able to identify the various insects is of great benefit to reduce the likelihood of ever being exposed. A good work practice is to drain containers and other collection points of water to decrease the mosquito population. If you find a tick attached to

Good resources for tick identification include:
https://www.cdc.gov/ticks/tickbornediseases/tickID.html and
https://www.cdc.gov/ticks/geographic_distribution.html.

Increased Risk of Bee, Wasp, Hornets, Fire Ants and Scorpions

Stings and bite are painful to anyone but can be life-threatening for those with an allergy. Any worker with a known allergy to stingers should carry an epinephrine pen and wear an identifying bracelet or necklace; prudent practice would be to share information about this allergy with co-workers.

Risk of a sting from bees, wasps and hornets is increased when hives/nests are disturbed or when working in flowering plants. Bees are attracted by sweat, discarded food, perfumes and the scent of banana, so personal hygiene and care with food are important safeguards. In addition, one sting can attract other bees due to release of a chemical as part of the sting; should you be attacked by several insects at once, go indoor or to a shaded area to escape. (Some will hover above water, so underwater is not a recommended place of refuge.) When working in an area with possible sting hazard, it is also recommended to wear light-colored clothing covering as much of the body as possible.

Fire ants are advancing north into Tennessee. These aggressive insects bite and sting. Diligent observation may identify ants. However, caution is needed when work involves lifting items off the ground that may hide ants and care should be exercised to not disturb or stand near ant mounds. These ants may also be seen on trees and in the water.

Scorpions have moved north into Tennessee and Kentucky and tend to hide under rocks or other materials laying on the ground. Stings can be avoided by wearing long-sleeved shirts, long pants and leather gloves; it is recommended that clothing and especially shoes be shaken out before putting them on in areas where scorpions may be present. See https://www.cdc.gov/niosh/topics/insects/default.html for additional information and resources.

Increased Risk of Contact with Poisonous Plants

Outdoor workers have increased risk of contact with poison ivy, poison oak and poison sumac, all of which release an oil (urushiol) if the leaf or other plant parts are bruised or broken. Severe allergic reaction can result. The first step in avoiding exposure is diligent observation of plants where you are working in order to recognize before contact. All workers should be familiar with the leaves of each of these, if they are grow in the area. Find maps of habitat and pictures of the plants here: https://www.cdc.gov/niosh/topics/plants/default.html. Of course, the plants can occur in other states than those shown, so if you see a suspicious plant, alert others and take actions to avoid exposure.

Prevent contact by wearing long-sleeved shirts, long pants, boots and gloves. All clothing should be washed separately in hot water. Barrier creams developed for those who may be exposed to these plants may be useful to protect skin but should be washed off and reapplied at midshaft. Because the urushiol oil can remain active on surfaces for as long as five years, wash all tools with isopropyl alcohol or large amounts of soap and water, being diligent to wear impervious disposable gloves for the task.

Inhaling smoke while burning these plants separately or in a pile of brush can result in a severe respiratory allergic response. Whenever burning is planned, the employer must provide appropriate respiratory protection.

Increased Risk of Encountering Venomous Snakes and Spiders

Rattlesnakes, copperheads and cottonmouth/water moccasins snakes can be encountered in the Midwest. Rattlesnakes may be seen sunning on logs, boulders or in open areas; when threatened, these snakes use the rattle at the end of the tail as a warning. Copperheads may bite when a worker inadvertently steps on the snake. Forests, rocky areas, swamps and sources of water are likely homes of copperheads. Cottonmouth snakes are associated with water bodies, or near water; if threatened, these snakes will attack. Coral snakes are in northern Alabama and could enter Tennessee; this snake hides in leaf piles and may burrow into the ground. See https://www.cdc.gov/niosh/topics/snakes/default.html.

Protection against snake bites include actions to stay away from tall grass and piles of leaves, avoid climbing on rocks, wearing boots and long pants and wearing leather gloves when handling brush and debris. Do not handle any snake and be aware that snakes are more active in warm weather and at night.

Black widow and brown recluse spiders are found in the Midwest. The black widow tends to be found in undisturbed areas such as under eves, in woodpiles and in debris piles. Similarly, the brown recluse likes sheltered areas including under logs or in piles of rock or leaves. See: https://www.cdc.gov/niosh/topics/spiders/types.html.

Prevention of spider bites includes wearing long pants and long-sleeved shirts, hat, gloves and boots when handling piles of material that could harbor spiders. Clothing, tools and other small equipment should be stored in tightly-closed containers; before use, shake out and inspect for spiders. Longer-term practices to minimize debris and keep grass cut around work areas will reduce potential for exposure. As spider bites may become infected with tetanus spores, it is recommended that exposed workers get a tetanus booster shot every ten years.

Increased Risk of Encountering Rabies Carrier (zoonotic transmission risk)

Rabies transmission from animals in the wild is increasing and is now the primary route of exposure in the US (https://www.cdc.gov/rabies/location/usa/index.html). Other sources include bats, racoons and foxes. To avoid exposure, do not approach any animal that appears sick; call animal control or other responsible parties to remove the animal. If bitten, wash the area immediately and then seek medical attention (https://www.cdc.gov/rabies/exposure/index.html).

Summary

As an outdoor worker, you qualify for particular attention and protection because, unlike other workers, you frequently lack the ability to escape the environment due to the nature of job duties. Your exposure to the elements is a direct consequence of your employment and therefore your working conditions and exposures are largely under the control of your employer.

Your choices to take individual action and respond to and adapt to the effects of climate change may be severely constrained due to the nature of your work. Recognize the protective measures you can take such as climate-related personal protective equipment (light colored, breathable long clothing, UV protective eyewear, water bottles or backpack reservoirs, sunscreen, insect repellants, boots and gloves, diligent observation). Think of this as the new PPE and work practices for mitigating the ill effects of climate change.

Consider having a small fanny pack or duffle bag “Climate Kit” that includes these PPE items so you always have them readily accessible; you may also want to include factsheet pictures of hazards to assist in identification, of these can be saved to your phone—use care not to contaminate your phone with urushiol!

Acknowledgement

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Discuss

How do these five major categories of climate change impact you?

Work by yourself or in a small group to discuss the impact on you at work. Make a list for report back on the Work Sheet.

Identification Work Sheet

Activity 1:

Increased ambient temperatures pose risks to me by/during:

Activity 2:

Increased air pollution presents risk to me when:

Activity 3:

Ultraviolet radiation poses hazards to me during these activities:

Activity 4:

The following severe weather events present risks to me at work:

Activity 5:

Vector borne illnesses or habitat change affects me at work in the following ways:

Action Work Sheet

Knowledge without action is frequently wasted.

You are now more aware of the hazards that our climate presents to you and can identify how to reduce these risks.

What actions are you going to take to reduce your risk to the hazards identified in each of the activities on the Worksheet?

Activity 1:

Activity 2:

Activity 3:

Activity 4:

Activity 5:

One barrier to implementing the changes you list above can be access to the needed resources. How are you going to ensure access to the items that can protect you from these environmental hazards?

Congratulations! By identifying new and emerging hazards, assessing your risk to these hazards, and identifying actions and resources to reduce your risk you have created a personal climate kit.

Use your kit and stay safe from these ever-changing hazards.