

Monitoring Monday – Let’s look at wet weather safety.

Join us each Monday as the Clean Water Team shares information and resources on water quality monitoring. This Monday we will look at wet weather safety.

Outdoor work requires proper preparation and safety, especially when working in the rain as there are additional hazards. Some of these hazards may include slipping and tripping falls and their related injuries, floods and debris slides, being struck by lightning, drowning, being unable to leave a monitoring site, and falling objects. Rapid changes in rivers and streams can also produce conditions that can result in powerful currents easily sweeping a person off their feet.

Staff and volunteers (workers) should be aware of these risks relative to the environment. Not only during wet weather, but also when conditions are particularly muddy underfoot, and during strong winds and storms. Monitoring programs should take precautions during these adverse weather conditions. This can include the implementation of safe work practices that will protect their safety and health, monitoring field conditions (weather, flooding, water releases...), training workers in the necessary knowledge and skills needed to identify wet weather-related hazards and illnesses and the processes to follow to minimize risks. Programs may also consider providing first aid and CPR training.

Programs should identify (and if possible, provide) appropriate PPE (Personal Protective Equipment). Equipment that is designed to be used in wet weather conditions such as hand tools with textured, nonslip grip handles should also be used.

Being prepared is your best defense against having to deal with adverse weather (rain, storm surge...) or geological events (earthquake, tsunami...). By taking safety precautions, training workers, and working wisely, you can reduce risk and maintain an effective monitoring program.

Teamwork

- Fieldwork should be conducted in teams of at least two persons.
- Field crews should tell someone where and when they are going, and when expected to return. Contact information should be provided if the crew fails to return on time.

Monitor Weather Conditions and Dam Releases

- Monitor the NOAA Weather Radio Station, or your favorite news source for vital weather-related information.
 - National Weather Service www.weather.gov/
 - NOAA Weather Radio www.weather.gov/nwr&ln_desc=NOAA+Weather+Radio/
- Monitor for scheduled reservoir water releases and flood information.
 - Scheduled Water Releases <https://cdec.water.ca.gov/queryRes.html>

- CDWR Flood Operations Center - Call (800) 952-5530 to listen to river forecasts, general water conditions, and flood information.
- Flood Emergency Response Information Exchange (FERIX) - Developed by the California Department of Water Resources to improve flood emergency preparedness, response, and recovery in California. It provides participating agencies an online system to access and exchange current flood information in real-time through Web GIS interface.
<http://ferix.water.ca.gov/webapp/home.jsp>

Wear Appropriate PPE (Personal Protective Equipment)

- Wear the right gloves for the task. Use hand protection that features a strong, slip-proof grip. Gloves should also have enough insulation to keep you warm but be thin enough so you can feel what you are doing. Make sure gloves are adequately tight and long enough to allow your raincoat sleeve to prevent water from entering the glove.
- Wear shoes that have good traction on the sole, with a large flat surface area. Winter traction devices (microspikes, snow grips, ice cleats...) can be worn when additional traction is needed to provide reliable and consistent grip on snowy and icy surfaces.
- Wear several layers of clothing rather than one thick layer.
- Wear appropriate rain gear that includes both pants and a coat. Be sure the material is ventilated so it can be worn comfortably for extended periods. If it is cold, select wool or synthetic materials that insulate even when wet. Be certain clothing fits properly so it does not interfere with movement.
- Use anti-fog eye protection and wipes.
- When working at night or in low light conditions, make sure you can be seen. Wear high-visibility clothing, especially in areas with vehicle traffic. Do not wear rain gear or vests that have become dull or are no longer reflective.
- Wear a properly fitted Personal Flotation Device (PFD) at all times when in or near a river or lake.

Walking in the Rain

- Keep a slow walking pace, avoid quick changes of direction, and work more slowly and deliberately.
- When navigating sidewalks and parking lots, keep your hands free as much as possible to help you maintain balance.
- Walk on designated pathways and sidewalks. Avoid taking shortcuts as they may be slippery.
- When using stairways, be sure to hold the handrail.
- Wear shoes that have good traction on the sole, with a large flat surface area. Also, be sure your pant leg lies over your boot or shoe. Tucking your pants into footwear can cause water to enter.
- When coming indoors from wet weather:
 - Wipe your shoes on a doormat to avoid tracking wetness into the building.
 - Shake off excess water from your wet field totes or other gear.

- Avoid walking through moving water. Six inches of moving water can make you fall. If you must walk in water, walk where the water is not moving. Use a wading staff stick to check the firmness of the ground in front of you.

Lightning Safety

Workers whose jobs involve working outdoors in open spaces, on or near tall objects, near conductive materials (e.g., metal) have significant exposure to lightning risks. Whilst the likelihood of getting struck by lightning is not high, it is important to understand how lightning behaves to minimize risks.

In general, a significant lightning threat extends outward from the base of a thunderstorm cloud about 6 to 10 miles. It's important to account for the time it will take for everyone to get to safety. Here are some criteria that could be used to stop activities.

If you see lightning. The ability to see lightning varies depending on the time of day, weather conditions, and obstructions such as trees, mountains, etc. In clear air, and especially at night, lightning can be seen from storms more than 10 miles away if obstructions don't limit the view of the thunderstorm.

If you hear thunder. Thunder can usually be heard for about 10 miles if there is no background noise. Traffic, wind, and precipitation may limit the ability to hear thunder to less than 10 miles. If you hear thunder, though, it's a safe bet that the storm is within ten miles.

If the skies look threatening. Thunderstorms can develop directly overhead, and some storms may develop lightning just as they move into an area.

The safest place to be during a thunderstorm is inside a building that is fully enclosed with a roof, walls, and floor. Substantial buildings with wiring and plumbing provide the greatest amount of protection. Do not lean against concrete walls or floors (which may have metal bars inside). Because electrical charges can linger in clouds after a thunderstorm has seemingly passed, experts agree that people should wait at least 30 minutes after the last thunder before resuming outdoor activities.

If safe building structures are not accessible, workers should seek refuge in a hard-topped metal vehicle with rolled up windows and remain in the vehicle for at least 30 minutes after hearing the last sound of thunder.

If you are caught outside and cannot seek refuge inside a building, follow NOAA's recommendations to decrease the risk of being struck.

- Lightning is likely to strike the tallest objects in each area—you should not be the tallest object.
- Avoid isolated tall trees, hilltops, utility poles, cell phone towers, cranes, large equipment, ladders, scaffolding, or rooftops.
- Avoid open areas, such as fields. Never lie flat on the ground.
- Retreat to dense areas of smaller trees that are surrounded by larger trees, or retreat to low-lying areas (e.g., valleys, ditches) but watch for flooding.

- Avoid water, and immediately get out of and away from bodies of water (e.g., pools, lakes). Water does not attract lightning, but it is an excellent conductor of electricity.
- Avoid wiring, plumbing, and fencing. Lightning can travel long distances through metal, which is an excellent conductor of electricity. Stay away from all metal objects, equipment, and surfaces that can conduct electricity.
- Do not shelter in sheds, pavilions, tents, or covered porches as they do not provide adequate protection from lightning.

Wet Weather Driving

Rain and wet road conditions are perhaps the worst conditions that most drivers will face on a regular basis. Hazards and risks are elevated whenever it starts to rain, or even if roads are still wet from a recent downpour. Many drivers will simply slow down as their only safety precaution when it begins to rain. While reducing speed is a crucial element of how to drive safely in wet conditions, there are several other techniques and considerations that motorists need to be aware of when driving in the rain.

- Drive A Clean Car in Good Condition
 - Replace windshield wiper inserts that leave streaks or don't clear the glass in a single swipe. Make sure all headlights, taillights, brake lights and turn signals are properly functioning so other drivers will see you during downpours. Turn on your headlights whenever you drive. Proper tire tread depth and inflation are imperative to maintaining good traction on wet roadways.
- Know The Roads
 - Take a moment to consider your route. Is the road paved, compacted gravel, or graded dirt? Each of these driving surfaces behave differently during wet weather. You might also want to consider whether a particular road goes through low-lying areas prone to flooding. It might be a good day to avoid certain roads.
- Slow Down!
 - Slowing down during wet weather driving can be critical to reducing a car's chance of hydroplaning, when the tires rise up on a film of water. With as little as 1/12 inch of water on the road, tires must displace a gallon of water per second to keep the rubber meeting the road. Drivers should reduce their speed to correspond to the amount of water on the roadway. At speeds as low as 35 mph, new tires can still lose some contact with the roadway.
 - To reduce chances of hydroplaning, drivers should slow down, avoid hard braking or turning sharply and drive in the tracks of the vehicle ahead of you. Also, it's important for motorists to allow ample stopping distance between cars by increasing the following distance of the vehicle in front of them and beginning to slow down to stop for intersections, turns and other traffic early.

- And remember never use cruise control on wet roads. If you hydroplane under cruise control, the automatic acceleration can cause you to lose control of your vehicle when your tires regain traction.
- Turn Around Don't Drown
 - Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely. The Centers for Disease Control report that over half of all flood-related drownings occur when a vehicle is driven into hazardous flood water. The next highest percentage of flood-related deaths is due to walking into or near flood waters. Why? The main reason is people underestimate the force and power of water. Many of the deaths occur in automobiles as they are swept downstream. Of these drownings, many are preventable, but too many people continue to drive around the barriers that warn you the road is flooded. Play it smart, play it safe. Whether driving or walking, any time you come to a flooded road, TURN AROUND, DON'T DROWN!

REFERENCES & RESOURCES

10 Crucial Things to Know Before You Start Driving in The Rain

<https://driving-tests.org/beginner-drivers/how-to-drive-in-rain/>

11 Tips for River Safety www.friendsoftheriver.org/2016/01/26/11-tips-for-river-safety/

Effects of Urban Development on Floods <https://pubs.usgs.gov/fs/fs07603/>

Flash Flood Safety Tips www.shelbyal.com/393/Flash-Flood-Safety-Tips

Flood Safety Tips and Resources www.weather.gov/safety/flood

How to Avoid Dangers of Downed Power Lines Amid Extreme

Weather www.accuweather.com/en/weather-news/how-to-avoid-dangers-of-downed-power-lines-amid-extreme-weather/356674

How to Stay Safe around Rivers <https://watersafety.org.nz/How+to+Stay+Safe+around+Rivers>

Landslide Preparedness www.usgs.gov/programs/landslide-hazards/landslide-preparedness

Landslides and Mudslides Fact Sheet www.cdc.gov/disasters/landslides.htm

Lightning Safety and Outdoor Sports Activities www.weather.gov/safety/lightning-sports

Lightning Safety When Working Outdoors www.weather.gov/media/owlie/OSHA_FS-3863_Lightning_Safety_05-2016.pdf

Living with Dams: Extreme Rainfall Events https://damsafety.org/sites/default/files/ASDSO-LivingWithDams-ExtremeRainfallEvents-NO%202-WEB_0.pdf

Post Wildfire Flash Flood and Debris Flow Guide
<https://streetsla.lacity.org/sites/default/files/DebrisFlowSurvivalGuide.pdf>

Prevent Hypothermia & Frostbite www.cdc.gov/disasters/winter/staysafe/hypothermia.html

(Reservoir) Scheduled Releases <https://cdec.water.ca.gov/queryRes.html>

Safety Tips For Driving In The Rain www.geico.com/living/driving/auto/car-safety-insurance/safe-driving-in-heavy-rain/

Stay Afloat: Always Wear a Life Jacket www.nps.gov/articles/life-jacket-wear.htm

Tips for Managing Construction Projects During the Rainy Season <https://murowdc.com/tips-managing-construction-projects-rainy-season/>

Tips for Protecting Workers During Adverse Weather Conditions <https://hazwoper-osh.com/blog-post/protecting-workers-in-bad-weather-conditions>

Turn Around Don't Drown www.weather.gov/tsa/hydro_tadd

Water Safety www.fs.usda.gov/visit/know-before-you-go/water-safety

Wet Weather Driving Tips <https://exchange.aaa.com/safety/driving-advice/wet-weather-driving-tips/>

Wet Weather Risks and Safety Precautions for Construction Workers
<https://prochoicesafetygear.com/ppe/blog/construction-whs/wet-weather-risks-safety-construction/>

Working in the Rain www.safetyandhealthmagazine.com/articles/working-in-the-rain-2

Working safely in the rain <https://safety.blr.com/training/workplace-safety-training-sessions/safety-administration/safety-general/Working-safely-in-the-rain/>

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Erick Burres

[Clean Water Team Coordinator](#)

[California Water Quality Collaboration Network Facilitator](#)

[Safe to Swim Network Co-facilitator](#)

erick.burres@waterboards.ca.gov

213 712 6862 mobile

Mailing address:

Erick Burres – Clean Water Team

C/O SARWQCB

3737 Main Street, Suite 500

Riverside, CA 92501-3348

