

# FLOODING PREPAREDNESS PACKET



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## 2014 Michigan Flood Risk Overview

On March 17, 2014, the National Weather Service (NWS) released its Michigan Spring Flood Outlook report for the upcoming spring. This report indicates the chances of flooding will be the result of several factors that cannot be forecast with any level of certainty. With a greater than average snowpack on the ground and thicker than normal amount of ice on streams and rivers, the NWS indicated there is a 40 to 90 percent flood risk for the state of Michigan. Ordinarily, the typical flood risk for this time of year would be 5 to 20 percent.

### What risk factors could cause greater flooding?

- Ice jams on the Great Lakes which could impede the “escape” of river ice.
- Deeper than normal snow pack.
- Additional snowfall.
- Quick warm-up.
- Intense or heavy rains.
- Rapid melting.
- Quick breakage and release of the ice cover.
- A combination of the above.

### What factors could improve the situation?

- Cool temperatures with sunny weather.
- Slow gradual melt.
- No rain or little or sporadic rains.
- Slow erosion of the ice pack.

### Where is the flood risk?

Flooding will depend on a delicate balance between time, temperature and rainfall. A slow melt and thaw will reduce the chances of flooding. For the latest flood risk location information, go to [water.weather.gov](http://water.weather.gov).

Across the state, there is a greater than average snow pack and a deeper than normal frost and freeze level. The later in the year that the ice and snow pack remain, the greater the risk of flooding because melting will occur more suddenly and in greater amounts.

The flood risk will be **minimized** if the snow pack melts gradually. The risk may be **greater** if Michigan experiences more snowfall, heavy rains and warm temperatures that lead to rapid melting. Ice jams on the Great Lakes could also impede the “escape” of river ice. A higher risk for flooding does not mean a prediction of record flooding but indicates that some flooding is likely. At this time, accurate forecasting for significant flooding is difficult.

### When did Michigan last experience widespread flooding?

Last year, President Barack Obama declared a major disaster for 16 counties across Michigan's Upper and Lower Peninsulas due to the severe flood damage that occurred from April 16 to May 14. The affected counties were Allegan, Barry, Baraga, Gogebic, Houghton, Ionia, Kent,

Keweenaw, Marquette, Midland, Muskegon, Newaygo, Ontonagon, Osceola, Ottawa and Saginaw.

This presidential declaration provided public assistance grants for affected state and local governments to rebuild roads, bridges and other public facilities and infrastructure. Eligible private non-profits were also eligible to apply.

## **What should I do?**

Emergency preparedness is the starting point for all Michiganders. Regardless of the potential threat or hazard, everyone must be prepared for any emergency by making a plan and creating an emergency preparedness kit. An emergency or disaster can happen at any time, to anyone. By planning ahead and creating a kit, you and your family will be better prepared for tomorrow.

## **What is in this packet?**

This packet is designed to give an overview about what to do before, during and after a flooding emergency or disaster. The information provided is to be used as guidance. If there is a life-threatening situation, immediately call 9-1-1. For information about human services available during an emergency or disaster, call 2-1-1.

The Michigan State Police, Emergency Management and Homeland Security Division has gathered materials and facts provided by the Michigan Committee for Severe Weather Awareness, Michigan Department of Community Health, Michigan Department of Environmental Quality, Michigan Department of Agriculture and Rural Development, Federal Emergency Management Agency and Center for Food Security and Public Health.

## Sample News Release

### Citizens Urged to Take Steps Toward Flooding Preparedness

**FOR IMMEDIATE RELEASE:**

**[DATE]**

**[LOCATION]** – As Michigan’s record-breaking winter comes to a close and the snow begins to melt away, the **[EMERGENCY MANAGEMENT AGENCY NAME]** is encouraging citizens to prepare for flood emergencies before they occur.

A quick spring thaw could lead to potential flooding throughout Michigan. While flooding is most prevalent near low-lying areas and bodies of water, it can occur almost anywhere, including near small streams, creeks and even basements.

“No matter where you live, flooding can pose a serious threat,” said **[RANK AND FULL NAME]**, **[WORKSITE]**. “To remain safe during a flood, citizens should prepare in advance by planning what they will do and where they will go during a flood. When driving, it is also important for individuals to remember never to drive through flooded roads. It is never worth the risk.”

Flood preparedness tips:

- Develop an emergency supply kit that includes essential items, such as a three-day supply of food and water, important family documents and items that satisfy unique family needs.
- Develop a family emergency plan that includes such things as an evacuation route, a designated meeting place for family members, and an emergency contact list.
- Before a flood occurs make an itemized list of personal property and photograph the interior and exterior of your home. Store the list, photos and documents in a safe place.
- Determine how high property is in relation to nearby streams and other waterways.
- Identify the safest and fastest route to higher ground.
- If living in a frequently flooded area, elevate the furnace, water heater and electric panel in your home, as well as keep sandbags, plastic sheets and lumber on hand to protect property.
- Know the difference: a Flood Watch means flooding is possible in or near your area; a Flood Warning means that flooding is occurring or will soon occur in your area.
- Avoid areas that are likely to flood, including dips, low spots and floodplains; always heed flood warnings and instructions from emergency officials.
- Consider installing sewer backflow valves to prevent flood water from backing up into your home through drain pipes.
- Double-check sump pumps to ensure they are working properly. If possible, have a battery backup system.

For additional flood safety tips, visit [www.michigan.gov/mifloodready](http://www.michigan.gov/mifloodready).

###

**FOR ADDITIONAL INFORMATION:**

Name, Location, Number

## Public Service Announcement

### Flooding Preparedness

Story running time: 30 sec. (Read)

Speaking time: 30 sec.

Anywhere it can rain or snow, it can flood.

I'm [Organization Name] [Title and Name] reminding you to plan and prepare this flooding season.

A quick spring thaw can produce large amounts of runoff in a short period of time. Because the ground is frozen, water cannot be reabsorbed and rapidly flows into lakes and rivers, causing excess water to spill over their banks.

Be prepared! Buy flood insurance, take an inventory of belongings and make an emergency plan.

For more helpful tips, visit

[Michigan-dot-gov-slash-mi-flood-ready](http://Michigan-dot-gov-slash-mi-flood-ready).

## Flooding Safety

Flooding can happen gradually or abruptly during any Michigan season. Learn the terms and know what to do before, during and after a flooding emergency or disaster.

### Flooding Terms

- **Flood Watch:** A flood watch indicates that flooding is possible in your area. Monitor local media channels and listen to your NOAA weather radio.
- **Flood Warning:** Indicates that flooding is occurring or will occur in your area. Move to higher ground and listen to local media for evacuation orders.
- **Flash Flood:** When rapid flooding occurs with great force. Low lying areas are at the greatest risk for flash flooding.
- **Flash Flood Watch:** Indicates that flash flooding is possible in your area. Monitor local media channels and listen to your NOAA weather radio for updated information.
- **Flash Flood Warning:** A flash flood is occurring. Seek higher ground and listen to local media and NOAA Weather Radios for evacuation orders and safety information.

### Preparing for a Flood

- Create an emergency preparedness kit with a 72-hour supply of water, including three gallons per person.
- Scan and store important documents on an online, cloud-based program.
- Put important documents and valuables in a water-proof container on the top floor of your home.
- Understand how to safely turn off electricity and gas lines in your home.
- Create an inventory of your household items and take photos of the interior and exterior of your home.
- Consider installing sewer backflow valves to prevent flood water from backing up into your home through drain pipes.
- Double-check sump pumps to ensure they are working properly. If possible, have a battery backup system.
- Keep materials like sandbags, plywood, plastic sheeting and lumber handy for emergency water-proofing.
- Find out how many feet your property is above or below possible flood levels. When predicted flood levels are broadcast, you can determine if you may be flooded.

- Raise or flood-proof heating, ventilating and air conditioning equipment by elevating equipment above areas prone to flooding. Another method is to leave equipment where it is and build a concrete or masonry block flood wall around it.
- Anchor fuel tanks. Unanchored fuel tanks can be easily moved by floodwaters.

## During a Flood

- Turn off utilities if instructed to do so. Disconnect all electrical equipment.
- Do not walk through moving water. Six inches is enough water to knock you down.
- Do not drive in flooded areas. Six inches of water can cause you to lose control and two feet of water can sweep away your vehicle. Remember: Turn around, don't drown.
- Listen to local media reports for information about if the water supply is safe to drink.
- Avoid contacting flood waters because they can be contaminated by hazardous liquids and may contain sharp debris.
- Report and stay 25 feet away from downed power lines.

## Driving in a Flood

- Flooding is the No. 2 weather-related killer behind heat. More than half of these fatalities occur when someone drives into floodwaters.
- Do not attempt to drive through a flooded road. The depth of water is not always obvious.
- Do not drive around a barricade. Barricades are there for your protection. Turn around and go the other way.
- Do not try to take short cuts--they may be blocked. Stick to designated routes.
- Be especially cautious driving at night when it is harder to recognize flood dangers.

## After a Flood

- Listen to local media reports for information about the water supply safety.
- Avoid flood waters because they can be contaminated by hazardous liquids and may contain sharp debris.

- Be aware of areas that were previously flooded. The roads may be weakened or washed out.
- Report and avoid downed power lines.
- Clean and disinfect anything that was wet from the flood. Throw away any food that was touched by flood waters.

**More Information/Additional Resources:**

- [www.ready.gov/floods](http://www.ready.gov/floods)
- [www.floodsmart.gov](http://www.floodsmart.gov)

## Protecting Your Home

Protecting your home from flooding may seem like a big job—and many people don't know where to begin.

First and foremost—every household should have an emergency preparedness kit. By taking the initiative to build an emergency preparedness kit, you will be better prepared in case an emergency happens. That means having:

- Water, at least three gallons of water per person
- Food, at least a three-day supply of non-perishable food per person
- Medications
- Battery-powered or hand crank radio
- Flashlight and extra batteries
- First aid kit
- Whistle to signal for help
- Pet supplies
- A complete change of clothing and footwear for each person
- Bedding
- Important family documents

Everyday tips that can help protect your home include:

- **Install Sewer Backflow Valves.** In some flood prone areas, flooding can cause sewage from sanitary sewer lines to backup into houses through drainpipes. Sewage backup not only causes damage, but also creates health hazards. Backflow valves have a variety of designs ranging from simple to complex. This is something that only a licensed plumber or contractor should do.
- **Raise or Flood Proof Heating, Ventilating and Air Conditioning Equipment.** In flood prone houses, a good way to protect HVAC equipment is to elevate it above the areas that flood. Another method is to leave the equipment where it is and build a concrete or masonry block flood wall around it.
- **Anchor Fuel Tanks.** Unanchored fuel tanks can be easily moved by floodwaters. One way to anchor a tank is to attach it to a large concrete slab whose weight is great enough to resist the force of floodwaters. Elevate tanks to a minimum of at least one foot above the base flood elevation. Floating and/or damaged tanks pose serious threats not only to you, your family and your house, but also to public safety and the environment.
- **Raise Electrical System Components.** Any electrical system component—including service panels (fuse and circuit boxes), meters, switches and outlets—are easily damaged by floodwaters. All components of the electrical system, including the wiring, should be

raised at least one foot above the base flood elevation.

- **Raise Washers and Dryers.** Washers and dryers can easily be damaged in a flood. In order to prevent this from happening, utilities can be placed on cinder blocks one foot above the base flood elevation.
- **Add a sump pump in your basement.** Sump pumps can help keep groundwater from entering your home's interior. Install a battery backup or have a generator available in case of power failure.
- **Buy flood insurance.** Flood insurance provides year-round financial protection and improves your ability to quickly recover when severe storms strike and cause unexpected flooding. You can also call your local insurance agent or 1-888-379-9531 to reach National Flood Insurance Program specialists.

## Flood Insurance

Flooding can occur during any season in Michigan. The National Flood Insurance Program (NFIP) estimates that 90 percent of all natural disasters involve flooding. A small amount of water can bring a tremendous amount of damage, and many property owners are unaware that their properties are at risk for flooding. A home has a four times greater risk of flooding than burning during the course of a 30-year mortgage.

What's worse: Many property owners don't realize that their homeowners' or property owners' insurance doesn't cover flood damage. To be covered from flood damage, an individual must purchase National Flood Insurance through an insurance broker who works with the Federal Emergency Management Agency. Consider that even just an inch of water can require a property to replace carpet, drywall, floor boards, moldings, doors and other belongings. Additionally, clean-up of mud and residue can be costly, as can repairing any mold and mildew damage that may occur.

### **Is flood damage covered by my homeowners insurance?**

Flood damage is excluded in nearly all homeowners and renters insurance policies, but it can be purchased as a separate policy.

### **Where do I get flood insurance?**

Any licensed property or casualty insurance agent can sell a flood insurance policy. If you experience trouble in locating an agent, contact the National Flood Insurance Program's agent referral program at 1-888-CALL-FLOOD or visit [www.floodsmart.gov](http://www.floodsmart.gov).

### **Is there a waiting period before my flood insurance policy becomes effective?**

There is a 30-day waiting period before a new or modified flood insurance policy becomes effective.

### **Do I need to live in a floodplain to get flood insurance?**

Nearly 30 percent of all flood claims come from outside the "100-year-floodplain" as determined by the National Flood Insurance Program. The fact that a property is outside of the "legal" floodplain does not mean that the river or stream can't reach that property. You do not need to live in a floodplain to purchase flood insurance – coverage is available to any building located in a community that has qualified for the National Flood Insurance Program. To learn more, go to [www.michigan.gov/floodplainmanagement](http://www.michigan.gov/floodplainmanagement)

### **Is water backup in basements covered by a flood insurance policy?**

Coverage for water backup in basements (drains/sewers) is excluded from the flood insurance policy.

## Making a Flood Plan

A flood plan is simply the advance methods your family, business or community have put together to help you respond quickly in the event of a flood near your property. Planning in advance can afford you extra critical time when a flood is coming, as well as help you increase the odds of protecting your valuable documents, your real estate and your personal property, including cherished belongings. A “rapid-response” plan can be as simple as a one-page plan that answers the following questions:

### **How will we find out about a coming flood?**

The first part of a flood plan is to find a way to receive advance warning of an unfolding situation. Large-scale flooding on a main stem of a river may occur over many hours or several days, but flash floods can strike in minutes. Signing up for flood alerts and monitoring weather patterns and local conditions are important steps. Flooding in Michigan can happen any time of the year.

### **At what river level does our property begin to flood?**

First, determine “What’s Your Number?” This means visiting the National Weather Service’s Advanced Hydrologic Prediction Services website at [water.weather.gov](http://water.weather.gov). Afterward, determine the level at which flood waters begin to affect your property. This step may take research or personal experience to determine, but it is worth talking to neighbors to find out how high the river was during recent floods, and at what point flooding began in your neighborhood. Each neighborhood and each property has its own unique terrain and placement to consider when determining this factor, and it is safest to err on the side of caution. Give yourself plenty of time to evacuate.

### **How can we prepare for floods?**

Preparing your household for a flood involves steps that will help you be prepared for many different types of disasters. An emergency kit might include first aid supplies, a three-day supply of non-perishable food, bottled water, a battery-powered radio, extra batteries and flashlights. Also, personal items like rubber boots and a rain jacket, warm clothes, and hygiene and sanitation products can be very helpful.

### **How will we learn about evacuation orders?**

Find out how your community notifies residents of floods and how it makes evacuation orders. Make a commitment to follow evacuation orders the first time, to prevent emergency personnel from having to return for a rescue when travel is no longer safe.

### **What access roads can we use to evacuate in the case of rising waters?**

Research indicates that the majority of flood-related fatalities occur as cars become trapped on roads that are known to flood. Talk to neighbors, emergency personnel and others to determine which, and when, access roads to your home flood. Know what roads you regularly travel and whether or not they will flood, and plan alternate routes when needed.

## **What steps should we take to prepare our property?**

Research the flood-proofing options available to you. Can you install a quick-disconnect furnace, or elevate electrical and mechanical equipment? Are there steps you can take to alleviate pressure on your structure if flooding does occur, to prevent extensive damage to doors and windows?

## **Where should our family meet if we are separated during a flood event?**

Is our child's school or spouse's workplace in a flood zone? Are access roads subject to flooding? Know safe evacuation routes from home, work and school that are on higher ground.

Plan and practice a flood evacuation route with your family. Ask an out-of-state relative or friend to be your emergency family contact.

## **Other Considerations**

- A written plan is essential for helping individuals and households think through important issues in advance. You should also investigate whether there are similar plans in place for work, daycare and school and see how they work with your plan.
- Expect roadways to be blocked. By using a cell phone (sparingly, so as not to clog the network), you can determine whether other friends and family are safely sheltered, and whether it is safer to wait out the storm than to risk dangerous travel across town through flood-prone roads. Remember: "Turn around, don't drown."
- Remember, the most common things people regret planning to save are: pets, photographs, and computers. Can you pack all these in a vehicle and drive to high ground in time?

## Staying Healthy

Widespread flooding has the potential to create an unhealthy situation. Well water and other drinking water sources can be contaminated—and floodwater has the potential of containing sewage, pesticides and other chemicals.

### What do I do about drinking water?

Only use safe drinking water. Do not use water that could potentially be contaminated to wash dishes, brush your teeth, prepare or wash food, wash your hands, make ice, or make baby formula. Listen to public announcements or contact your local health department to find out if your tap water is safe to use. Until the water is safe, use bottled water or boil and disinfect water.

### Is my well water safe to drink?

If flooding occurs around your water well, your drinking water may become contaminated. When flood waters rise over the top of the well, contaminants can enter through the well cap or vent and increase the risk of illness. The well can act as a drain as flood water cascades down the casing into the aquifer.

Flood water contains bacteria and viruses from soil, organic debris, and sewage systems, along with fertilizers, pesticides and other chemical contaminants. Shallow wells and old, poorly-constructed wells (e.g., dug wells) are vulnerable to water quality changes when turbid flood waters deposit contaminants close to the well. Older wells located in below grade pits are vulnerable to contamination from flooding, even if flooding at the ground surface did not occur. Well pits are unsanitary and are prone to flooding after heavy spring rains or rapid snowmelt occur and surface water or the water level within the surrounding soil gathers within the pit.

If your well has been flooded, you should immediately refrain from drinking the water and take the following steps:

1. Once the flooding recedes, begin flushing the water system. Hook a hose up to an outside faucet or a faucet near the water storage tank and flush the water for at least two hours after the water clears up. If a large volume of water entered the well, several hours of pumping may be needed. Once the water is clear at the storage tank, flush the home distribution piping.
2. Contact a state of Michigan-registered water well drilling contractor and request that your water system be disinfected.
3. After flushing the chlorine from the system, collect a water sample and submit it to a certified laboratory for coliform bacteria analysis.
4. Contact your local health department for further assistance if needed.

**NOTE: If your well becomes flooded, DO NOT drink the water until testing verifies it is safe.**

## Where do I go to get my water tested?

Homeowners should periodically test their drinking water for coliform bacteria. An annual test is recommended (or more frequently if the taste, odor, or water clarity changes). Coliform bacteria (common in the intestines of warm-blooded animals) are indicators of the potential for disease-causing organisms to be present in the water supply. Tests for metals, petroleum products, pesticides and other chemicals are also available from state or privately operated laboratories. Water sample bottles, information about which test may be most appropriate for your situation and interpretation of water test results are available from your local health department.

If your water system was flooded, it is especially important to check the water quality before continuing to consume the water. The water is considered safe for drinking after two consecutive samples—collected eight hours apart—shows that coliform bacteria are not present.

## What can I use for a temporary water supply?

If flooding of your well has occurred, the water should not be consumed until testing has verified that it is potable (fit to drink). Here are some alternatives to ensure that you and your family have a safe temporary drinking water supply until your water system is restored:

- Keep a supply of bottled water on hand as emergency drinking water. A few five-gallon pails filled with water and stored in your basement are helpful for toilet flushes and other nonpotable uses during power outages.
- Water can be boiled to kill any harmful microorganisms. Bring the water to a rolling boil for at least two minutes, and then let it cool. Pouring the water back and forth between two clean containers will reaerate the water and refresh the taste.
- Water can be disinfected with household chlorine bleach (unscented) by applying ten drops of bleach per gallon of water. Allow at least four hours of contact time before drinking. Avoid attempting to disinfect turbid or cloudy water.
- A portable water filtration/purification unit—available at camping or backpacking stores—can be used to prepare small amounts of drinking water. These rely on hand-operated pump to force the water through a filter (typically less than one quart per minute). Be sure that the unit will remove microorganisms down to 0.3 microns in size. Carefully follow the filter manufacturer's instructions.

## How do I get rid of mold?

Many people want to know how to get rid of mold. You can clean a small amount of mold yourself. Use a mixture of one cup of bleach to one gallon of water. Remember, never mix bleach, or products containing bleach – with ammonia, or products containing ammonia. Read the label on any product to see what it contains. If you see mold that covers an area of more than 10 square feet, consider getting a professional to remove it.

How about mold and your health? If you are allergic to mold, or you have asthma, being around mold may make your condition worse. If you have a chronic lung condition or a weak immune system, you could develop mold infections in your lungs, and you should try to avoid buildings contaminated with mold. If you think that mold is affecting your health, please see your health care provider. In general, you don't need a protective mask, called an N95 mask, just for reentering a building after a disaster. If you plan to clean up mold, you should buy an N95 mask at your local home supply store. Follow the instructions on the package for fitting the N95 mask tightly on your face. To learn more, go to [www.michigan.gov/mold](http://www.michigan.gov/mold).

### **Is the floodwater safe?**

You can prevent injuries by avoiding or minimizing your exposure to floodwater. Floodwater can be contaminated with chemicals and/or sewage, and can have dangerous pieces of floating or hidden metal and glass. Be sure to turn off main electrical breakers or fuse boxes and avoid downed power lines to prevent electrocution.

## Flooding and Pets

Floods can impact animal health as well as human health. Make plans for your pets in the event you will need to evacuate.

### Before a Flood

- **Create an emergency supply kit for your pet:**
  - Leash and collar
  - Transport carrier
  - Food and water (5-7 day supply)
  - Any medications
  - Vaccination history, rabies certificate
  - Waste disposal supplies
  - A blanket
  - Favorite toy
  - Your veterinarian's contact information
  - Special supplies for pets such as birds, pocket pets or reptiles (e.g., heat lamps)
- **Make sure pets are current on all vaccinations.**
- **Develop an evacuation plan for your pets.**
  - For public health reasons, many evacuation shelters will not be able to accept pets.
  - Identify pet-friendly locations in case you need to evacuate.  
[www.petswelcome.com](http://www.petswelcome.com) is a good source.
  - Check with boarding facilities, pet-friendly hotels, veterinary clinics or relatives or family friends outside the impacted area.
- **Identification**
  - All pets should have some sort of identification (e.g., collar with tag, microchip).
  - Take a photo of the pet and keep it with the medical records.
  - Include any proof of ownership materials (e.g., registration, proof of purchase, adoption records, microchip information)

### During a Flood

- **Bring your pets inside immediately.**
- **AVOID leaving pets behind.**
  - If there is no other alternative, leave them loose inside your home with food and plenty of water.
  - NEVER leave your pet chained outside or enclosed in a way they cannot escape danger.
  - Place a notice on the outside of your home with the location and type of pets inside, their names, your contact phone number and the name and number of your veterinarian.

## After a Flood

- **Be aware that a pet's behavior may change before, during and even after a disaster.**
- **Familiar scents and landmarks may be altered and your pet may become confused and lost.**
  - In the first few days after the disaster, leash your pets when they go outside.
  - Always maintain close contact.
  - Reintroduce food in small servings, gradually working up to full portions, especially if animals have been without food for a prolonged period of time.
- **Pets can be poisoned by exposure to harmful chemicals, products or foods.**
  - If you suspect that your pet has been poisoned, call the Animal Poison Control Center toll-free 1-888-426-4435.

Source: [www.Prepare4AgThreats.org](http://www.Prepare4AgThreats.org)

## Flooding and Livestock

Floods can impact animal health as well as human health. Make plans for your livestock and horses in the event you will need to evacuate your farm.

### Before a Flood

- **Maintain an inventory.**
  - Keep a current list of all animals on your farm.
  - Include their location and any records or vaccinations, testing and ownership.
- **Have identification for all animals.**
  - Make sure animals have some form of permanent identification (e.g., ear tags, tattoos).
  - Ensure animals are properly vaccinated before exposure to floodwaters.
- **Prepare an evacuation kit.**
  - Handling equipment (e.g., halters, nose leads).
  - Water, feed and buckets.
  - Medications.
  - Tools and supplies needed for manure cleanup.
  - Safety and emergency items for your vehicles and trailers.
  - Gas-powered generators.
- **Make evacuation arrangements.**
  - Determine possible evacuation areas—higher elevation, alternate production facilities (e.g., temporary milking parlors).
  - Determine several routes to these locations.
  - Identify alternate water or power sources.
  - Locate and prearrange feed and water delivery; necessary equipment (e.g., milking) and services (e.g., milk pickup).
  - Have well-maintained backup generators for livestock production operations.
  - Make transport arrangements (e.g., trucks, trailers) with experienced handlers and drivers.
  - Condition animals to being loaded and transported.
- **Ensure a safe environment**
  - Assess the stability and safety of barns and other structures.
  - Remove dead trees or objects from fields or livestock areas that may serve as potential debris during a flood situation.

### During a Flood

- **Be aware animal behavior may change before, during and even after a disaster.**
  - If you must evacuate, ensure your family's safety first.
  - If there is time, move or evacuate livestock and horses to higher ground.
- **AVOID leaving animals behind.**
  - If there is no other alternative, keep gates or buildings open so they can escape high water.

- Provide access to a safe, free-choice food source, clean water and the safest living areas possible.
- Do not rely on automatic watering systems because power may be lost.
- Establish routes to safe locations (higher elevation).
- Place your contact number and the name of your veterinarian on the building.

### After a Flood

- **Assess your animals and building structures.**
  - Survey damage to your barns and other structures, assess the stability and safety.
  - Examine your animals closely—contact your veterinarian if you observe injuries or signs of illness.
- **Return animals only after the threat has passed and the safety of buildings or the area has been assessed.**
  - Release animals in a safe and enclosed area until familiarity of the surroundings can occur.
- **Provide non-contaminated feed or water**
  - Provide clean, uncontaminated water.
  - Do not feed flood damaged or moldy feed or hay.
  - Do not use any feed or forage that may have been contaminated by chemical or pesticides.
- **Animal disposal**
  - Record any animal deaths.
  - Check with your state or local authorities for proper disposal methods for animal carcasses.
- **Prevent illness**
  - Keep animals away from flood waters which may contain harmful bacteria or chemicals.
  - Monitor animals daily for signs of illness.

Source: [www.Prepare4AgThreats.org](http://www.Prepare4AgThreats.org)

## Additional Resources

- [www.michigan.gov/mifloodready](http://www.michigan.gov/mifloodready)—Preparedness information provided by the Michigan State Police about what to do before, during and after flooding occurs.
- [www.michigan.gov/prepare](http://www.michigan.gov/prepare)—Emergency preparedness health and safety information by the Michigan Department of Community Health, Office of Public Health Preparedness.
- [www.mcswa.com](http://www.mcswa.com)—Additional flooding information provided by the Michigan Committee for Severe Weather Awareness.
- [www.weather.gov](http://www.weather.gov)—Map providing outlook on current significant river flooding.
- [water.weather.gov](http://water.weather.gov)—Interactive maps of Michigan’s current flood conditions, river forecasts, long-range flood risk and precipitation levels.
- [floodsafety.noaa.gov](http://floodsafety.noaa.gov)—Flooding safety tips from the National Oceanic and Atmospheric Administration.
- [www.redcross.org](http://www.redcross.org)—Flood safety information from the American Red Cross.
- [www.floodsmart.gov](http://www.floodsmart.gov)—Preparation and recovery information about flooding.
- [www.Prepare4AgThreats.org](http://www.Prepare4AgThreats.org)—Resources to help rural communities prepare for disasters and other hazards by the Center for Food Security and Public Health.
- [www.redcross.org/prepare/mobile-apps/flood](http://www.redcross.org/prepare/mobile-apps/flood)—American Red Cross flood application.