



# **SURVIVAL WATER PURIFICATION & STORAGE**

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## INTRODUCTION

When you are thirsty, need to do dishes or take a shower, you simply walk to the sink or the bathtub and turn the handle on the faucet. Most people in the United States have never turned that handle and been met with a lack of flowing water. It is for that reason that many find it so easy to take water for granted.

While the infrastructure in this country is strong, it is certainly not flawless. This has been proven many times over when various natural or manmade disasters left portions of the population without water for a period of time.

It is possible to live without food for several days, but this is not the case with water. If your access to water were to be cut off then you would need to have way to get fresh drinking water in order to survive.

What if there was no running water due to an incident that interrupted the flow from municipal sources or from your well? What if you did have running water, but that water was contaminated by acts of terrorism, flooding or in other ways?

Many people assume that the Red Cross or local government will come to their aid in such situations, and this is often the case. What is important to remember, however, is that it is not *always* the case. There have been situations in which it was not possible to reach those who needed help.

It is not that these organizations would not want to help, but past disasters have shown that it is not always possible to get help to everyone. When Hurricane Ike bore down on the Gulf of Texas in 2008, some residents scrambled to evacuate. Flooding that took place much earlier than anticipated thwarted evacuation plans for many, forcing them to ride out the storm.

One of the hardest hit areas was Galveston. Three quarters of all homes in Galveston were damaged or destroyed. Sadly, many who had tried to follow the orders to evacuate were killed when the flooding forced them to stay. Many who did survive were faced with the daunting task of getting through the first several days until rescuers could reach them.



Because they had planned to leave, many did not have any water or food to sustain them. The stories of survival are amazing. One older man walked for four hours until he reached a flooded grocery store. He was able to find a case of water, which he then dragged back to his home. It took rescuers six days to reach him and his wife. Had he not found that water, it is not likely they would have survived.

The devastation of Hurricane Katrina, which slammed the Gulf Coast in 2005, is probably one of the most well-known examples of why being prepared is important. After the winds subsided, many residents thought they had dodged a bullet. When the levees failed, however, many died while praying for rescuers to reach them. Few will ever forget the images of men, women and children huddled on rooftops and of dead bodies left on sidewalks.

In both of the above examples, rescuers were trying to help, but in times of such turmoil and disaster, it can take days or even weeks for help to arrive. That is why you must have a plan that includes water storage and how to source and collect water in an emergency. There are any number of situations that could result in a need for you to have to be self-sufficient when it comes to water, food and other essential.

This guide will teach you the basics of such preparation. Start making plans today. You never know when your preparation will mean the difference between life and death.



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## GENERAL PREPARATION

### *When a Disaster is Imminent*

As mentioned above, you should begin your emergency planning today. Waiting for a disaster to be imminent could mean that you do not have the time that you need to be properly prepared. Obviously, some disasters will come without warning. Others may give you some time, but you may find it difficult to find the items that you need.

That being said, there are some steps that you can take when you know a disaster is coming.

### *Fill Bathtub*

Fill the bathtub, sinks, and any other containers that you can get your hands on, with water. Some people keep large five gallons on hand, but even if you do not have such large containers, fill anything you can with water. Keep in mind that water stored in containers that are not food grade should only be used for sanitary purposes rather than for drinking. Still, you should collect as much water as possible in the hours leading up to the disaster.

### *Buy Extra Cases Of Water*

This is a step that really illustrates the importance of preparing ahead of time. If you wait until a disaster is coming, you will probably have a hard time finding cases of water. That is because thousands of people will also be attempting to prepare at the last minute and bottled water will be one of the first things to sell out.

Still, if you do not have a good supply of water on hand, you should try to find some even if it means driving to several stores to do so.

### *You Won't Always Have Warning*

Running around to several stores looking for water in the hours before a hurricane or other disaster is inconvenient, but at least you will have a chance to prepare. This is not always going to be the case. There are many types of disasters for which there will be no warning whatsoever.

- Acts of war
- Terrorism
- Tornadoes
- Flooding
- Earthquakes



When such disasters strike you will either be prepared or you will not. Take to heart the reality that good preparation can save your life and the lives of those that you love.





## STORING WATER

### *How Much to Store*

How much water you should store depends on many factors such as the number of people in your family, how much storage space that you have and how long you would like your supply to last. Obviously, the more water that you have, the more prepared you will be, but the fact is that most people simply do not have the space to store sufficient water for the long term. That is why your preparation should include plans of where to source and how to collect water. (Both of those will be discussed later.)

The general rule of thumb is that you should have at least one gallon per day per person. While this is more than is generally needed per day to survive, if you are particularly active – for example, clearing debris in the hot sun – then you will need to drink more.

You should also have another half of a gallon or so per person for sanitary purposes and for handling other tasks, such as rinsing dishes.

If you assume one and a half gallons per person per day, you will be in good shape. You should aim for AT LEAST a three day supply, but that is a bare minimum. How many days' worth you decide to store is up to you, but you should try to store as much as possible.

Even if you have access to water, such as a stream or nearby lake, you still need to consider a water storage program. Many types of disasters could cause the water source to become contaminated, forcing you to rely on your stored water for survival.

### *Where to Store Water*

Some people are lucky enough to have a basement or large garage in which they can dedicate space for their emergency water and food storage. Others live in small apartments and simply do not have the extra space. Still, if you are creative, you will be able to find ways to store enough water to last your family for weeks in an emergency.

In all cases, you want to be sure to store water away from light and heat. A cool, dark space is best. You also want to be mindful of the potential for many containers to leak. For this reason, you should not store the bottles where a leak could damage wood floors or cause other types of damage.

For those with limited space, the key is going to be in the types of containers that you choose. There are options that allow you to stack the containers, allowing for more storage in a limited space. If feasible, take advantage of space under the bed or consider dedicating part of an extra closet to your storage. Some people raise their bed just for the purpose of adding some extra storage space beneath.

Storing water outside is not ideal. As mentioned above, you want to avoid extreme temperatures and sunlight. If it is your only option, aim for storage in a carport or other covered area where you can at least avoid direct sunlight.

### *Types of Storage Containers*

There are many types of storage containers that are appropriate for storing water. Below are some ideas.

#### **Repurposed Containers**

Repurposed containers include soda bottles, juice bottles and any other containers that you have used that can be filled with water. There are a couple of things to keep in mind when using repurposed containers for water storage:



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- **Durability** – These bottles and containers were not designed for long-term use. For that reason, they are more apt to develop leaks than containers that were designed to be more durable.
- **Clear** – Many of these containers are clear. This makes it more likely that algae may develop as none of the light is being filtered.

That being said, these containers are better than nothing. If you do use repurposed containers for all or some of your water storage, it is important to rotate the water and to keep the water out of the direct sunlight.

## Boxes

Boxed water storage kits are a great choice for a number of reasons.

1. The boxes, each of which holds five gallons, can be stacked making this a good choice for those with limited space. You can easily stack 20 or more gallons in a closet and still be able to use the closet for other purposes.
2. The boxed water storage kits keep out light completely making this a good option for long term storage.



3. Should you have to flee, boxed water storage kits are easy to take with you. Unlike large barrels that can be too heavy to move, each box only weighs about 40 pounds so moving them is easy.

Each kit includes a Mylar pouch that you fill with water. The pouch is then placed inside the box for easy stacking.

## Barrels

For large quantities of water storage, barrels are a good choice. You want to be sure to buy barrels that were designed for water storage. These barrels will be made of food grade plastic and will be resistant to light and algae.

Water storage barrels can be purchased in a variety of sizes including those that range from 5 to 55 gallons. You will also need a siphon and a spout. Many barrels come with the siphon and spout. If yours does not then they can be purchased separately.

## Pouches

Mylar pouches, similar to those that are used with the boxed storage kits, are a good choice for water storage that doesn't take up a lot of room. Mylar pouches are available in a variety of sizes, so you can tuck them away in any extra small spaces around your home. They are also lightweight and easy to move. While they are not too easy to puncture, you do need to treat them with care to avoid leaking.

## Prepackaged Water

In addition to containers that you fill with water, prepackaged water is another option for your water storage plans. The most common would be jugs and cases of drinking water. These are fine for shorter term storage and must be rotated regularly.





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For longer term storage, consider the following:

## Canned Drinking Water

Canned drinking water is sealed in a number ten can, just like dehydrated foods intended for long term storage. The water has been treated in a way that makes it suitable for storage for up to 30 years. The cans are easy to move, can be stacked and there is no chance of leaking. The downside is that the canned water is pricy when compared to other options. Each number ten can costs about \$4.

## Prefilled Pouches

Pouches containing individual servings of drinking water are a great addition to emergency kits kept in a vehicle, go bags or school emergency kits. Each pouch contains about 4 ounces of drinking water and costs between .25 and .35 cents each.

## Boxed Drinking Water

Prepackaged boxed drinking water is sold in 4 and 8 ounce options. They are another good choice for emergency kits, but take up more room than the pouches.



## Short Term Storage Tips

- For short term storage, rotation is important. Be sure to use and replace your cases of water as well as water stored in repurposed containers.
- For very short term use, such as when a disaster is imminent, use the tips above and fill your bathtub, sinks and any other container you can find. The water in the tub should be used for sanitary purposes rather than for drinking. This is also true for any water stored in containers that are not food grade or that once held non-food items.

## Long Term Storage Tips

- If you store water in the proper containers and under the proper conditions, you will not need to rotate the water as often as with your short term storage. That being said, it is still a good idea to rotate the water occasionally. One of the best ways to do this is by doing practice drills during which you only use your stored water. Such practice drills will be discussed below.
- Sometimes water can develop a bad taste after being stored for a period of time. This does not necessarily mean that the water is “bad”. Often, simply pouring the water back and forth from one container to another will allow the water to aerate and improve the taste of the water.

Some people have emergency food storage pantries that would sustain their families for several years. It is very difficult to store enough water for that period of time which is why learning how to source and collect water is so important.



# SURVIVAL WATER PURIFICATION & STORAGE

## SOURCING AND COLLECTING WATER

Sourcing and collecting water can be important for both the short term and the long term. Even if you have stored water, it might not be enough. For that reason it is important to know where you can find water. For the long term, it is important because, as mentioned above, storing enough for months and years is virtually impossible.

### *Know Sources Near You*

Become familiar with water sources near you. This includes lakes, streams and similar sources. As mentioned above, you will not be able to rely solely on these sources as it is quite possible for them to become contaminated. The key in your emergency water plan is diversity, so this could be one of the important pieces of the puzzle.



### *Rain Collection*

Learning the basics of rain collection is one of the best things that you can do in terms of your water survival planning. Rainwater collection generally includes four steps:

1. Collecting the rainwater
2. Channeling the rainwater to tanks or barrels for storage
3. Purifying the rainwater
4. Distributing the rainwater



There are many rainwater collection systems. Some are homemade, and it is quite inexpensive to get started. Others are more industrial and are a bit more costly to set up. Some think that rainwater can only be used for gardening and similar purposes.

For the most basic of rainwater collection systems, you need to simply cut one of your drainpipes and divert it to a large barrel. Be sure to have more than one barrel on hand, so that you will be able to collect as much water as possible during a good rain.

The truth is that if you have the proper purification systems in place, you can use rainwater for everything, including drinking water.

Some of the most elaborate systems will include huge underground rainwater collection tanks. This allows you to collect much more water without the need to pepper your yard with storage barrels or tanks. This is also a good option if you do not want it to be common knowledge that you have a rainwater collection system in place.

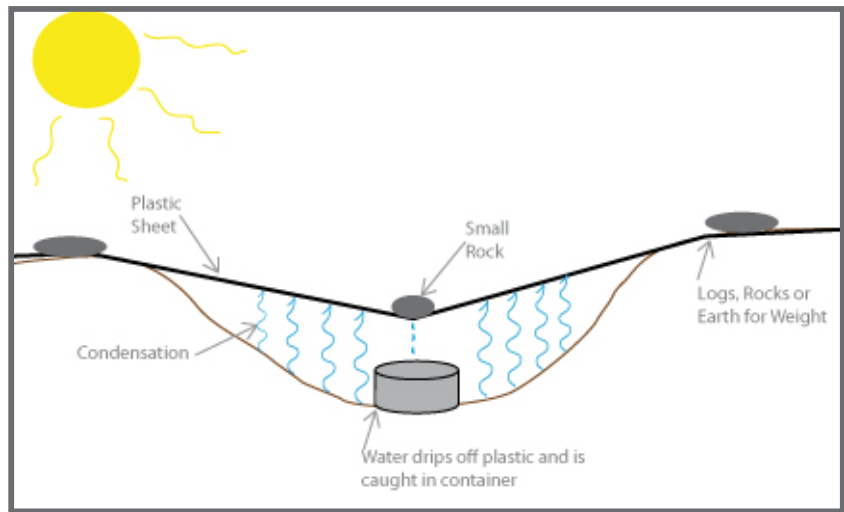
There are plans for do-it-yourself collection systems online and a simple search will yield you the names of companies that specialize in installing rainwater collection systems.



## ***Underground Water Stills***

While this will not provide you with a significant amount of water, if done properly you can get a quart per day. Below are the steps required to create an underground water still.

- Choose a location that gets plenty of sun during the daylight hours and that is in a low lying area.
- Dig about 15 inches down. You will need to dig this deep in order to get any water. The sides of the hole should not be straight up and down. Instead, you should aim for a bowl shape.
- Place your collection container in the center and cover the entire hole (including container) with plastic sheeting.



- Place a rock over the container and use other rocks to hold down the sides of the plastic sheeting.

In the morning you should find that the condensation has collected in your container. Because water collected in this manner may contain bacteria and other impurities, it is important to purify the water before use.

## ***Wells***

If possible, consider installing a well on your property. As is the case with other water sources, it is possible for the water to become contaminated but, as mentioned earlier, it is about having different options at your disposal.

## ***Swimming Pools***

Swimming pools can be a source of emergency water, but there are a few things you'll need to keep in mind.

- After a loss of power, the pools will quickly begin to grow algae. That doesn't mean you will not be able to use the water, just that extra treatment steps will be needed.
- Some are surprised to learn that it is possible to drink water from a swimming pool. Because different pool owners use different chemicals, it is best to only consider drinking the water from a pool for which you know how the water has been treated. Some chlorine is safe to drink. The FDA says that water with no more than 4 parts per million is safe to drink. Before drinking pool water, you should boil it for at least one minute and also run it through a high quality water filter.

## ***Hot Water Heaters***

Depending on the size of your water heater, you have somewhere between 30 and 60 gallons of water on hand at all times. It is important that you learn how to access that water. Most hot water heaters have a valve from which you can access the water, but you will need a hose or pump to make collecting the water easier.



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## ***Other Sources***

In extreme conditions, you will need to find water anywhere that you can. Of course, some of the water sources mentioned below may not yield water that is suitable to drink. Still, some of it could be treated making it potable.

### **Cactus**

You may have seen a survival show on which someone got water from a cactus in a survival situation. If you plan to spend time in the desert, you should get to know the various types of cacti that you may encounter as well as the basic methods of getting water from each.

- Not all cacti are safe to eat or drink from. Some are poisonous and drinking water from them can put you in danger.
- It is important to learn the proper methods of getting water from each type of cactus. If you use the wrong method, you could waste what precious little water there may be in the cactus.
- If you plan to be in the desert, be sure you have some tools with you, including a machete. Getting water from a cactus without a machete will be very difficult.



### **Car Batteries**

If stranded in your car without water, you will need to quickly find a source of water in order to survive. One place that you will be able to find a small amount of water is in the car's battery. Keep in mind that this is only an option if you know that you will not be able to drive the car and you have no other option.

### **Drain Pipes**

As a last resort, you can cut your pipes and drain any water that may have settled in the pipes. Be sure to have containers ready to catch the water so that none goes to waste.

### **Urine**

Many of the most famous survival stories, such as that of Aron Ralston who amputated his own arm after being pinned by a boulder, include drinking urine. While common sense would say that this is a bad idea considering that urine is waste, the truth is that urine contains water. If it is your only option, here are some things to keep in mind.

- Drink the urine right away after eliminating. The longer it sits, the more time for bacteria to grow.
- The more times that you pass urine after you begin drinking it, the less potable it will be. That is because as you drink the urine, the higher the concentration of waste to water.
- If you have a high quality filter, run the urine through before drinking it.





## TREATING WATER

If you do not have sufficient potable water in your storage or find yourself in an emergency situation in which you will need to treat water, there are several methods to consider.

### *Boiling*

Boiling water will kill pathogens and bacteria, making many water sources safe for drinking. You must boil the water for at least 3 to 5 minutes. If you are worried about losing some of the water through evaporation during the boiling process, simply cover the pot. This will cut down on the amount of water lost through evaporation.

If possible, filter the water before boiling. This is especially important if the water appears cloudy or has visible debris.

### *Filters*

There are many, many different types of water filters. A high quality water filter can mean the difference between having safe drinking water and having to drink water that is questionable. While the cost of water filters start at just a few dollars, plan to pay anywhere from a few hundreds to a couple of thousand dollars for the highest quality filters.

Ideally, you will include two water filters in your kit. The first will be a small pump type filter, like the ones you would use for camping. The other would be larger, and would have the ability to process larger volumes of water. Keep in mind that the common water filters that are used in kitchens are not appropriate for emergency situations as they cannot filter out harmful contaminants.

If you are serious about emergency preparedness, high quality water filters should be high on your list of items to add to your kit.

### *Chemicals*

There are two chemicals that are commonly used to treat water: chlorine and iodine. Keeping iodine in your emergency kit is a good idea as it is effective at killing many bacteria found in water. You must keep in mind, however, that water treated with iodine is not safe for everyone, particularly the elderly, pregnant women and those with an allergy to iodine. Iodine must be safely stored at the correct temperature or it will lose some of its potency.

All you need to treat water with chlorine is simple household bleach. For every quart of water, add two small drops of chlorine bleach and allow the water to sit for about 30 minutes. If the water is very cloudy, add a couple more drops and allow to sit an extra 30 minutes.

If you keep bleach in your emergency supplies for this purpose, be sure to rotate the bleach every three to six months as the potency of bleach diminishes quite quickly.

### *Impromptu "Filters"*

In extreme emergencies, impromptu filters such as a bra or shirt sleeve, can remove solids from water that you want to drink. Of course, this type of "filter" will do nothing to remove bacteria, but in a true survival situation, you may have no other option.







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## MAKING WATER LAST

In a survival situation, you will need to be reserved in the way that you use water and other supplies. Here are some tips to curb the use of water.

### *Tips to Curb Your Use*

- Ration drinking water. Know how much you need each day, and then ration it throughout the day. While rationing is important, **YOU SHOULD ALWAYS DRINK WHAT YOU NEED**. Just don't be frivolous with drinking water (see note below).
- Rather than taking a normal bath, wash up using a basin a few times a week and save a full bath for once or twice a week.

### *Think Like a Pioneer*

Imagine if you had to find and then carry every drop of water that you used. In a survival situation, this is how you need to think. Even if your emergency supply of water is neatly stored in your basement, you need to think like a pioneer so that you do not waste even one drop.

### *Gray Water*

If part of your survival plan includes growing your own food, then you will need water with which to water your plants. Consider collecting gray water for this purpose. Gray water is water leftover after bathing or washing clothes or dishes.

It is safe to use this water for watering plants, but you should only use it on older plants and use cleaner water when tending to seedlings.

**NOTE:** While practicing conservation is important, you should not conserve drinking water. Instead, drink what you need. Many people have been found in the desert. They died of thirst with a canteen full of water because they thought it best to conserve. You **NEED** water, so drink what you need. In general, each person will need at least ½ gallon per day. If you are doing manual labor, you will need to up the needed amount to about one gallon per day.



## IMPORTANCE OF PRACTICE

An important part of your survival planning, including water storage, is practice.

### *Drills*

Do drills a few times a year with your family during which you turn off the water supply and survive for a few days using only your emergency water storage and source collection methods. This type of practice will ensure that every member of the family is familiar with the various treatment and collection options.

The drills will also make everyone much more prepared should an actual emergency arise. This will greatly reduce the amount of stress each person will endure as they will already be very familiar with how to deal with only using your emergency supplies.

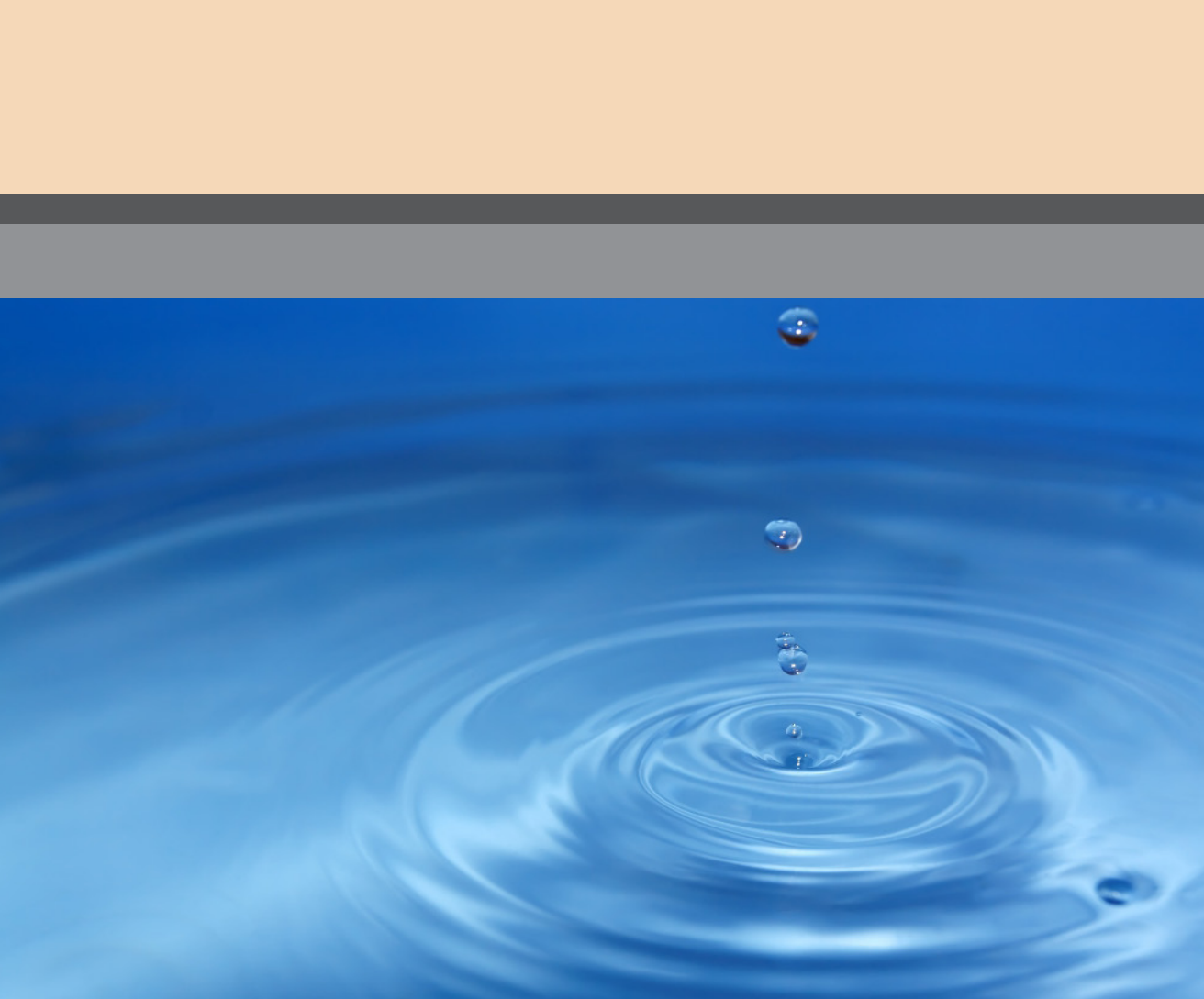
If you do not already have an emergency water plan in place, today is the day to start developing one. There could come a time when you do not have access to water and rescuers are unable to reach you for days. Should such an emergency arise, the preparation that you make now could be the difference between life and death.

## RESOURCES

<http://www.fema.gov/plan/prepare/water.shtm>

<http://theepicenter.com/tow02236.html>

<http://beprepared.com/category.asp?c=137>



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