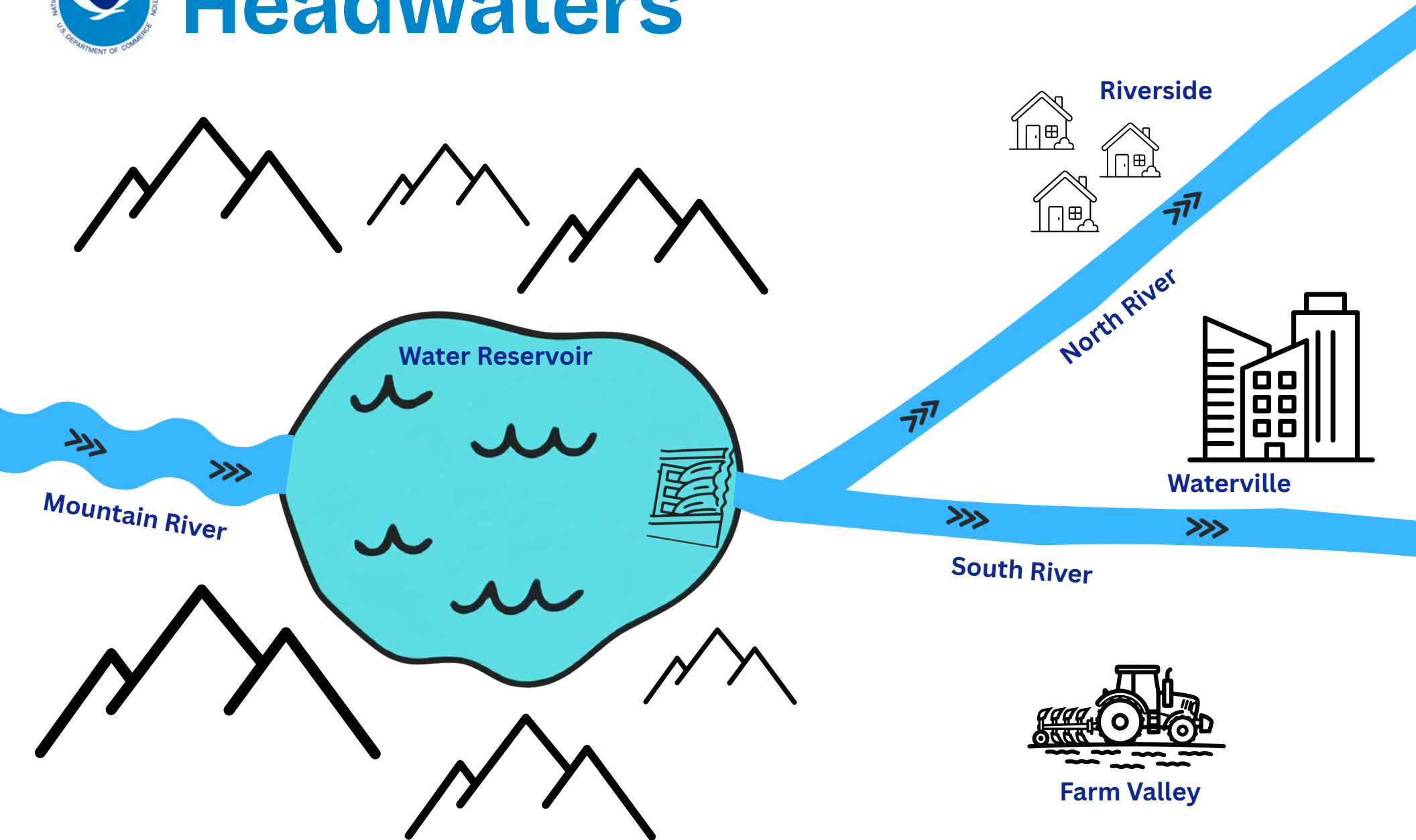




Headwaters



Map Key



reservoir
dam



direction of
water flow



mountains

Headwaters



Headwaters are the starting point for major rivers. In many mountain states, rivers form from both springs, where water bubbles up from underground, snowmelt and rain water.

In this game, you'll work as a team to move water from where it is stored in the reservoir to where people live and food is grown.

Headwaters Game

Goal: Work together to make sure there is enough water for everyone who uses water from Water Reservoir.

Setup: Each player chooses a job card. This will be your job for the game!

Choose a random STARTER CARD. Distribute water drops on the Headwaters map as described in the STARTER CARD.

Create a stack of cards for playing the game. In this game, you will play through spring, summer, and fall. Cards should all be chosen randomly. Create a CARD STACK in this order:

3 spring cards
1 event card
3 summer cards
1 event card
3 fall cards

Playing the Game: The CARD STACK should be face down with the spring cards on top.

In each round, 3 actions happen:

#1 - Choose the first spring card and read it aloud. Follow the directions on the card.

#2 - All players discuss how water drops should be moved. Water can move from the reservoir downstream to the rivers, Riverside, Waterville or Farm Valley.

#3 - Players each decide if they can play an icon.

Continue playing 3 actions with each card in the CARD STACK.

Watch the video directions:



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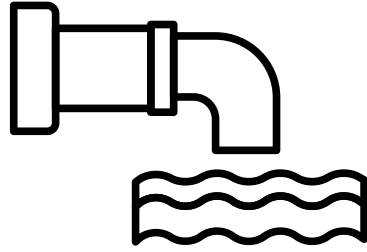
#3 - Players each decide if they can play an icon.

Continue playing 3 actions with each card in the CARD STACK.

Watch the video directions:



Riverside Water Manager



Water levels in Riverside:

Minimum 1 water droplets

Maximum 4 water droplets

If less than 2 drops, a water ban is needed.

If more than 4 drops, Watertown will flood.

After each card is played:

Decide if more water should enter Watertown from North River.

If there is only 1 water drop, place a **water ban**.



If there are 3 or 4 water drops, **extra water** can be used.

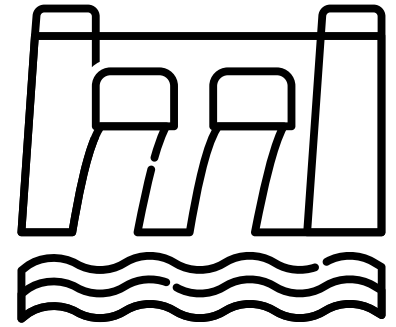


If there is 5 or more drops, alert the town to **flood danger**.



Game Goal: Riverside levels are between 1-4 drops after the last fall card.

Reservoir Manager



Water Levels for the Reservoir:

Minimum 5 water droplets

Maximum 10 water droplets

If less than 5 drops, water cannot be released into the rivers.

If more than 5 drops, water will flood over the dam.

After each card is played:

Decide if more water should enter Water Reservoir from Big River.

Decide if water should leave Water Reservoir through the dam.

If the dam floods, place an **engineer** to fix the dam.



Game Goal: Reservoir water levels are between 5-10 drops after the last fall card.



Learn about rainfall and snowpack:



snowpack



Mountain snowpack is measured throughout the year with SNOTEL sensors that are on the ground in various locations. Additionally, the amount of snow can be measured from airplanes using lidar.

The amount of water in the snowpack is calculated on April 1st each year to understand how much water will likely melt and flow into reservoirs.

rainfall



When rain is in the forecast, dam managers will need to be sure there is enough room in the reservoir to collect the new water falling from a storm. If the dam is at risk of flooding, the dam manager will release water into the river.

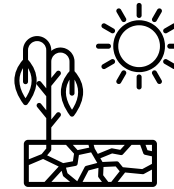
Game Goal: Reservoir water levels are between 5-10 drops after the last fall card.



Learn about drought and flood:



drought



Drought is a prolonged period with little precipitation. Droughts will be worse if an area is also unusually hot, and more water is lost through evaporation.

During a drought, town managers will enact water bans, telling residents and businesses to stop watering, or use less water.

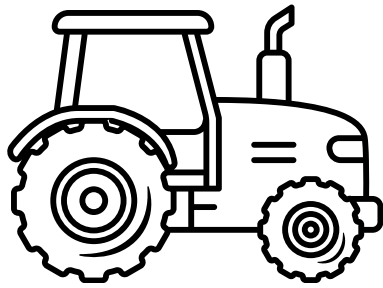
flood



A flood can occur if there is a heavy rainfall. Flooding can also occur if a lot of water enters a river upstream and then travels downstream in the river. Floods can damage homes and businesses, and risk people's safety. The best thing to do in a flood is move to higher elevation.

Game Goal: Watertown levels are between 1-4 drops after the last fall card.

State Agriculture Manager



Water Levels for Farm Valley:

Minimum 2 water droplets

Maximum 5 water droplets

If less than 3 drops, less crops will grow.

If more than 5 drops, crops will be damaged and food can't be sold.

After each card is played:

Decide if more water should enter Farm Valley from South River.

If there are 4 or 5 water drops, give one **crop** to Watertown and two **crops** to Waterville.

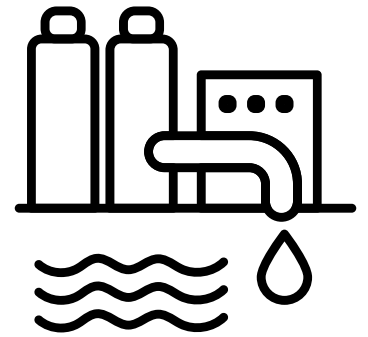


If there is 2 or less drops, **close the farm stand**.



Game Goal: Farm Valley water levels are between 2-5 drops after the last fall card.

Waterville Water Manager



Water levels in Watertown:

Minimum 2 water droplets

Maximum 6 water droplets

If less than 3 drops, a water ban is needed.

If more than 6 drops, Waterville will flood.

After each card is played:

Decide if more water should enter Waterville from North River and South River.

If there is 1 or 2 water drops, place a **water ban**.



If there are 5 or 6 water drops, **extra water** can be used.



If there is 5 or more drops, alert the town to flood danger.



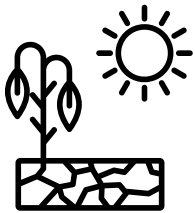
Game Goal: Waterville levels are between 2-6 drops after the last fall card.



Learn about drought and flood:



drought



Drought is a prolonged period with little precipitation. Droughts will be worse if an area is also unusually hot, and more water is lost through evaporation.

During a drought, city and town managers will likely enact water bans, telling residents and businesses to stop watering, or use less water.

Flood



A flood can occur if there is a heavy rainfall or if a lot of water moves downstream along the river. Floods can damage homes and businesses.

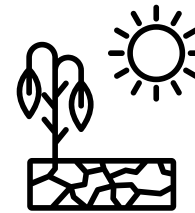
Game Goal: Waterville levels are between 2-6 drops after the last fall card.



Learn about drought and rainfall:



drought



Drought is a prolonged period with little precipitation. Droughts can be more extreme if an area is also unusually hot, and more water is lost through evaporation.

In hot weather, crops will need more water. If a drought lasts multiple years, farmers may plant crops that require less water.

rainfall



If a forecast has no precipitation predicted then farmers may want to use more water. If too much rain falls, crops may be damaged.

Game Goal: Farm Valley water levels are between 2-5 drops after the last fall card.

Recreation Manager



Water Levels for North and South Rivers:

Minimum 1 water drop
(in each river)

Maximum 4 water droplets
(in each river)

Rafting is only allowed with 2-3 drops in each river.

More than 4 drop causes flooding.

After each card is played:

Decide if more water should enter the South or North River from Water Reservoir.

Place a **raft** in each River with 2 or 3 drops.



Place a **canoe** and **sailboat** in Water Reservoir if there is more than 7 drops.

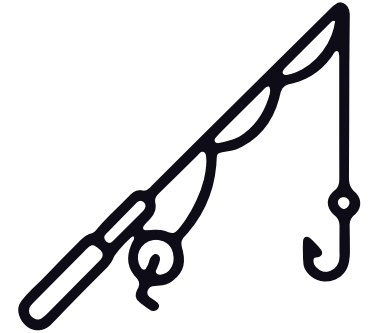


If there is only 1 drop, or more than 3 drops, **close rafting** on the river.



Game Goal: Water levels in North and South Rivers are each between 2-3 drops after the last fall card.

Fish and Wildlife Manager



Water Levels for North and South Rivers:

Minimum 1 water drop
(in each river)

Maximum 4 water droplets
(in each river)

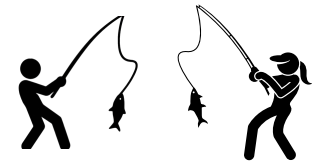
Fishing is only allowed with 2-4 drops in each river.

More than 4 drop causes flooding.

After each card is played:

Decide if more water should enter Waterville from North River and South River.

Place a person **fishing** in each river with 2-4 drops.



If there is only 1 drop, or more than 4 drops, **close fishing** on the river.



Game Goal: Water levels in North and South Rivers are each between 1-4 drops after the last fall card.



Learn about flood and river levels:



flood



Flooding in rivers can happen during heavy rainfall, or if water overflows a dam and enters the river.

river levels



Water from headwater states flow in rivers, downstream to many locations. Each state has an allocated amount of water they are able to use from the river. Large rivers often have a number of dams where water can be collected as it travels down stream, and then distributed in different directions.

Game Goal: Water levels in North and South Rivers are each between 2-3 drops after the last fall card.



Learn about flood and water recreation:



flood



Flooding in rivers can happen during heavy rainfall, or if water overflows a dam and enters the river.

water recreation



White water rafting companies will be unable to use the rivers if water levels are too low. When water levels are high, conditions can be more challenging, which can be fun for experienced rafters but difficult for beginners.

Boaters will be unable to use reservoirs when conditions are too low and boat ramps become inaccessible.

Game Goal: Water levels in North and South Rivers are each between 1-4 drops after the last fall card.

STARTER
card



STARTER
card



STARTER
card



STARTER
card



STARTER
card



STARTER
card



STARTER
card



STARTER
card



April 1st

It was a very snowy winter.
The reservoir has an average amount of water.

Put 20 drops in the mountains, 10 in the reservoir, and 2 drops in Big River.

April 1st

It was a drier than average winter.
The reservoir has an average amount of water due to a wet fall.

Put 10 drops in the mountains, 10 in the reservoir, and 2 drops in Big River.

April 1st

It was a very snowy winter.
The reservoir is low due to a dry summer.

Put 20 drops in the mountains, 5 in the reservoir, and 1 drops in Big River.

April 1st

It was a very snowy winter.
The reservoir is high due to a wet spring and summer.

Put 20 drops in the mountains, 15 in the reservoir, and 1 drops in Big River.

April 1st

It was an average winter.
The reservoir is low due to a dry summer.

Put 16 drops in the mountains, 5 in the reservoir, and 1 drops in Big River.

April 1st

It was an average winter.
The reservoir is high due to a wet spring and summer.

Put 16 drops in the mountains, 10 in the reservoir, and 2 drops in Big River.

April 1st

It was a drier than average winter.
The reservoir is low due to a dry summer and fall.

Put 10 drops in the mountains, 5 in the reservoir, and 1 drops in Big River.

April 1st

It was a drier than average winter.
The reservoir is high due to a wet spring and summer.

Put 10 drops in the mountains, 15 in the reservoir, and 1 drops in Big River.

SPRING
card



SPRING
card



SPRING
card



SPRING
card



SPRING
card



SUMMER
card



SUMMER
card



SUMMER
card



SUMMER
card



SUMMER
card



FALL
card



FALL
card



FALL
card



FALL
card



FALL
card



Mountain snow is melting.

Move half of the drops in the mountains into the reservoir.

Move 1 drop from the mountains to Big River.

Mountain snow is melting.

Move half of the drops in the mountains into the reservoir.

Move 1 drop from the mountains to Big River.

Mountain snow is melting.

Move half of the drops in the mountains into the reservoir.

Move 1 drop from the mountains to Big River.

A rainstorm is forecast!

Do you want to adjust water levels in the reservoir before it comes?

After deciding, roll the dice and add that number of drops.

A rainstorm is forecast!

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A rainstorm is forecast!

Do you want to adjust water levels in the reservoir before it comes?

After deciding, roll the dice and add that number of drops.

The last week has been hot and there's been a lot of evaporation.

Take away 2 drops from the reservoir, 1 drop from Farm Valley, 1 drop from Watertown and 1 drop from Waterville.

The last week has been hot and there's been a lot of evaporation.

Take away 3 drops from the reservoir, 2 drops from Farm Valley, 1 drop from Watertown and 2 drops from Waterville.

A rainstorm is forecast!

Do you want to adjust water levels in the reservoir before it comes?

After deciding, roll the dice and add that number of drops.

A rainstorm is forecast!

Do you want to adjust water levels in the reservoir before it comes?

After deciding, roll the dice and add that number of drops.

A rainstorm is forecast!

Do you want to adjust water levels in the reservoir before it comes?

After deciding, roll the dice and add that number of drops.

It's been very dry in lower elevations.

Take away 3 drops from Farm Valley, 2 drops from Watertown and 2 drops from Waterville.

It's been very dry in lower elevations.

Take away 2 drops from Farm Valley, 1 drop from Watertown and 1 drop from Waterville.

SPRING
card



SPRING
card



SPRING
card



EVENT
card



EVENT
card



SUMMER
card



SUMMER
card



SUMMER
card



EVENT
card



EVENT
card



FALL
card



FALL
card



FALL
card



EVENT
card



EVENT
card



Flood!!

Extreme rain in lower elevations has lead to 3 new drops in Southville River and 3 new drops in Northville River.



Flood!!

Extreme rain in the mountains has lead to 5 new drops in Water Reservoir.



New snow fell in the mountains.

Add 3 drops to the mountains.

A large building fire in Waterville required a lot of water.

Move 2 drops from the reservoir to Waterville.

New snow fell in the mountains.

Add 4 drops to the mountains.

Drought!!

A drought in Farm Valley has depleted water resources. Take away all water from Farm Valley.



Drought!!

A drought in Farm Valley has depleted water resources. Take away all water from Farm Valley.



A new neighborhood is built in Watertown.

Move 2 drops from the reservoir to Watertown.

It's been very hot and dry in lower elevations.

Take away 3 drops from Farm Valley, 2 drops from Watertown and 2 drops from Waterville.

It's been very hot and dry in lower elevations.

Take away 2 drops from Farm Valley, 1 drop from Watertown and 1 drop from Waterville.

Fire!!

A fire in the mountains requires a lot of water. Remove 5 drops from Big Reservoir.



Fire!!

A large fire in the Waterville requires a lot of water. Remove 3 drops from Waterville.



New snow fell in the mountains.

Add 2 drops to the mountains.

It's been warm and dry in lower elevations.

Take away 3 drops from Farm Valley, 2 drops from Watertown and 2 drops from Waterville.

New snow fell in the mountains.

Add 3 drops to the mountains.

Reservoir
Manager

ICONS



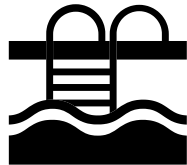
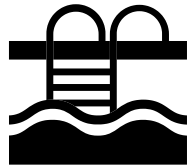
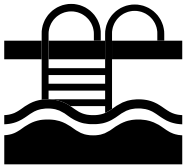
Recreation
Manager

ICONS



Riverside
Water Manager

ICONS



Fish and Wildlife
Manager

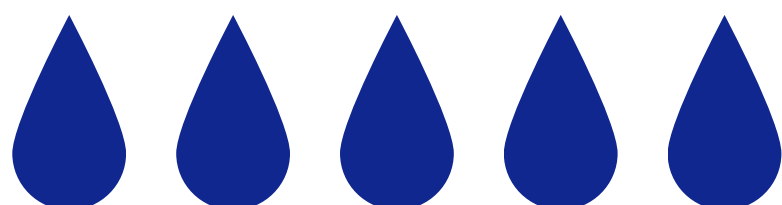
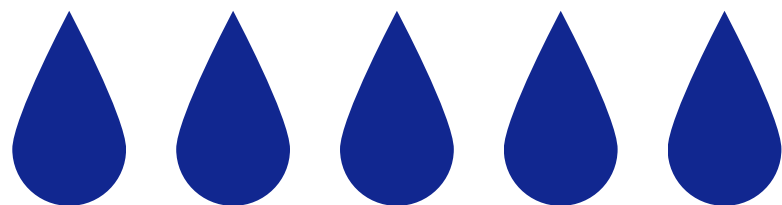
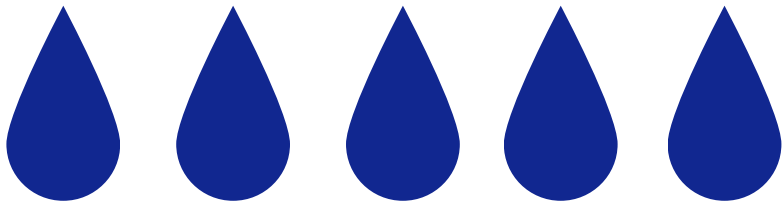
ICONS



Waterville
Water Manager

ICONS





State Agriculture
Manager

ICONS