

Milwaukee Waters and Beyond Presentation Script

Intro: This is a fun and interactive presentation that includes activities to help engage students and track their knowledge. The cadence should be fun, grateful, (we're so lucky to live near all this freshwater) and hopeful (look how we've cleaned up our waters in the past). Please encourage our youth to participate in the future of solving the world's water challenges.

Tools: Projector, presentation and maps - US and Milwaukee Waters

Slide 1: Water: Earth's most precious and spectacular substance. In this presentation, we will explore our local waterways while discovering what makes water so vital, the threats it faces, and what we can do to help preserve this life-giving resource.

Slide 2: Water has many qualities. It can be beautiful when shimmering in a pristine mountain lake, traveling along a babbling river, or cascading down a waterfall. But water can also be powerful. Tidal waves, floods, and tsunamis, are just some examples of how damaging water can be.

Slide 3: Water is the most amazing substance on Earth and there's no other compound like it. It's the only substance that naturally occurs in three states: solid (like ice), gas (clouds and steam) and liquid (like rain).

Slide 4: But perhaps the most important quality of water, is that it is essential for life. It's a life-giving substance to humans, plants and animals. Water provides nourishment to living things and helps grow our food. It provides habitats for creatures around the globe.

It is also used for transportation, generating power (hydroelectricity), combating wild and domestic fires, and supporting agriculture.

Slide 5: Earth's nickname is the Big Blue Planet, because 70% of our planet is water, but it is not all usable or accessible. There are two types of water on Earth: salt water (the water in our oceans) and freshwater (the water from in our lakes, rivers, groundwater and ice) The water on Earth is mostly saltwater - about 97.5%. The remaining 2.5% is freshwater in glaciers, groundwater, rivers and lakes.

Slide 6: So where exactly is our freshwater? Less than 1% of all the world's water is freshwater that is available to over 8 billion people, not including animals. That's not much! Almost 69% of freshwater in the world is in glacial ice. Glaciers are made from accumulated snow and are difficult to access. 0.3% of freshwater is in lakes and rivers. Most towns and cities get their water from lakes and rivers if they don't receive it from the ground, which leads us to the last source of freshwater: groundwater. Almost 31% of freshwater in the world is in the ground in large cavities called aquifers. We get our water in Milwaukee from Lake Michigan, but if you live outside of Milwaukee, chances are you're getting your water from groundwater.

Slide 7: Water is so important for our health; our bodies depend on it! Our body composition is about 70% water. And much of our brain, blood, heart, bones, muscles, and other organs are made of water and rely on it to function efficiently.

Slide 8: Humans aren't the only living things made of water; animals, birds, reptiles, fish and plants are made up of mostly water too and need it to survive.

Slide 9: Let's explore the water around us. Wisconsin's location proves quite beneficial. The state is surrounded by three major bodies of water: Lake Michigan, Lake Superior, and the Mississippi River, while also housing over 15,000 lakes. Lake Michigan and Lake Superior are a part of the Great Lakes system (think H.O.M.E.S.). These lakes are all connected and flow out to the St. Lawrence Seaway and the Atlantic Ocean. These surface lakes are 25% of all the freshwater in the world – right in our backyard!

Slide 10: We are very fortunate to live in the Milwaukee area, known as the Freshwater Capitol of the World! Our city has one of the Great Lakes on our shore, three major river systems, and dozens of stream. The three rivers: Milwaukee, Menomonee and the Kinnickinnic are each part of a watershed. A watershed is an area that drains into a river. On this map, each river's watershed is a different color. All 3 of these rivers are in the Lake Michigan watershed. The dark brown line shows the continental divide - water that falls inside the brown line goes to Lake Michigan, and water that falls outside of the brown line goes all the way to the Mississippi River.

Slide 11: The Great Lakes region is water-rich, however, we are mostly surrounded by a world in a water crisis in populated areas. This map shows the global view of areas in water stress. As you can see, the majority of the U.S., Europe, and Asia are under water stress.

Slide 12: Water is in constant motion around the planet and changes states along the way from liquid to gas to solid. The sun drives the water cycle. The sun heats the earth's water which causes water to evaporate and rise as gas (evaporation).

Water droplets cool, condense and form clouds. Then water falls as rain, sleet or snow. It's so amazing that there is the same amount of water on earth now as when the dinosaurs roamed the earth.

Slide 13: Where does water from inside our schools, homes and businesses go when it goes down drain? Simply put, it goes down the drain to a network of underground pipes that lead to a water treatment plant. Specific to our area, water goes to be cleaned at the Milwaukee Metropolitan Sewerage District Treatment Plant.

Slide 14: Wastewater, or fluid from our homes and businesses, travel through pipes underground to the treatment plant by the Summerfest grounds. The MMSD has a multiple step process for thoroughly cleaning wastewater. However, not everything is able to be cleaned out like caffeine, micro-plastics, some chemicals.

Slide 15: In the 1980's, the MMSD built a huge underground tunnel system, called the Deep Tunnel. to hold excess wastewater. The tunnel is twenty-eight miles long, 17-32 feet tall, 135-300 feet deep and holds up to 521 million gallons of water that is waiting to be cleaned. Since 1994, they've captured and cleaned 98.4% of stormwater and wastewater that entered the regional sewer system.

Slide 16: So where does outside water go? A big rain washes off everything on the land as it races to a storm drain, low area or right into a river or lake. This is stormwater. Stormwater carries away litter, pet waste, cigarette butts, chemicals, fertilizers, pesticides, and soil that is in our yard and on the streets.

Stormwater often goes right into a storm drain that either flows into a combined sewer that flows to the treatment plant or directly into our waterways. A direct flow into waterways causes stormwater to be the number one source of pollution to our lakes and rivers.

Slide 17: The illustration on this page shows how stormwater runoff pollutes our water sources. We can help eliminate pollutants by keeping the land clean, which will in turn keep our water clean.

Slide 18: In Milwaukee, the three rivers come together by Summerfest and flow out into Lake Michigan. However, when it rains these rivers carry debris off the land and flow together to carry sediment and stormwater that flows out into the lake. See this large plume? That is pollutants brought there by stormwater. After a large rain the beaches are often closed because the water is contaminated. The passing of time will eventually mix the dirty water near the shore with water from the rest of the lake, dispersing some of the contaminants.

Slide 19: (If available, stop and do a 10-minute demo with an Enviroscape Model and Milwaukee Waters map, otherwise skip this slide) Let's learn about what a watershed really works and see how water flows in our neighborhoods.

Slide 20: Native Americans have lived in this area for thousands of years. They used their canoes on the waterways, which were like highways to move into and around Milwaukee before it was even a city, just an area of wetlands and forests.

In the mid 1700's, people from Europe such as Germany, Poland,

Ireland began to settle in this beautiful and water-rich area. They brought many skills from their homelands, like beer and sausage making, and building and constructing cities.

During the late 1800's the Menomonee Valley and the wetlands were filled with businesses and manufacturing. Over the next 150 years the population grew from hundreds to thousands. Pollution from raw sewage from homes and toxic chemicals from companies were dumped into the waterways, especially in the Menomonee Valley. People treated these waterways like garbage dumps and threw away cars, tires, refrigerators and all sorts of junk.

Slowly the waterways began to improve. In the early 1920's we began to treat the raw sewage and in 1970's the Clean Water Act stopped companies from dumping their toxic waste into the waterways.

Slide 21: Together many groups and agencies have made progress improving water quality over the last 30 years in the Milwaukee area. Today, our rivers and Lake Michigan are finally in better shape. The Menomonee Valley has also been cleaned up of toxic soil and sediment and now new businesses have moved in. The waters are cleaner, floating garbage is reduced, the diversity of fish and wildlife is growing. It's once again safe to canoe and kayak on the rivers and in 2018 there was even a swimming race - the 1st in over 60 years! The future goal is to have fishable, swimmable and drinkable water for all. Our waters are cleaner thanks to hundreds of individuals and dozens of organizations.

Slide 22: Milwaukee is also home to the UWM SFS, the only freshwater university and research center like it in the world!

Milwaukee is also home to the new Global Water Center with businesses and researchers that are finding solutions to the world's water crisis. This is the largest cluster of water businesses in the U.S.

Slide 23: Should we care about water?

Absolutely! Lake Michigan is the source of our drinking water and we need clean water to survive.

Slide 24: Water can and has become contaminated in our area, whether it was radium contaminated groundwater in Waukesha, or cryptosporidium (a microscopic bug that caused many residents to get sick) contaminated drinking water in Milwaukee, our water sources are always at risk. Harmful algae blooms in lakes and ponds have also become more widespread in the summer under certain conditions.

Slide 25: There have even been instances where water sources have disappeared overtime. For example, the 4th largest lake in the world, the Aral Sea, almost completely disappeared in 2014. The Sea is a freshwater lake that is larger than Lake Michigan. This body of water, located south of Russia disappeared over a 20-year period because people dammed two rivers flowing into the lake to remove water to grow fields of wheat and cotton. The Aral Sea today is a desert. The exposed lake bed had industrial harmful waste that is now blowing around in this very windy area.

Slide 26: We need to remember the majority of the world is in a water crisis. Thousands of cities worldwide have restrictions –some cities are close to running out of water. 844 million people don't have access to clean water. The quality and quantity of water affects the health of billions of people.

There are many cities in the U.S. and worldwide that don't have enough water for their residents and businesses. Therefore, they need to restrict the amount of water people use, like using water to water lawns or gardens or washing cars.

Slide 27: The good news is that there are many solutions to the world's water problems, several of which have already been implemented around the globe. Urban communities use green infrastructure like rain barrels, rain gardens, green roofs, porous pavers, native landscaping, stormwater trees, bioswales and more to manage water where it falls so it reduces stormwater runoff and flooding which helps improve water quality.

Slide 28: You as an individual are a part of the solution too! Never dump anything down the storm drain, keep the land clean of litter, pet waste, and harmful chemicals, and use our Simple Solutions Resource Guide which has over 50 quick and easy tips you can do at home to help protect our waters. We need your creative minds to find more solutions!

Slide 29: Milwaukee is our home. It's our job to keep it clean for today and for the future. We need more brilliant minds to solve the world's water issues. We are so lucky to live here! Be proud Milwaukee! Keep it clean and protect our waters. Tell others too!

Slide 30: Thank you! We hope you have a new appreciation for water, our most most precious and spectacular resource!