Bahamian Freshwater Resources

Slide 1, Bahamian Freshwater Resources
Introducing Lesson 3,

We're back with another water lesson, which is identifying freshwater resources in The Bahamas. Today, we will explore the term "resources" and the various forms of resources in regards too freshwater.

Slide 2, What is a natural resource?
A natural resource is anything that can be found in nature, not made by man, and can be used by people. Earth's natural resources include: light, air, water, plants, animals, soil, stone, minerals, and fossil fuels.

Upper Primary:
Natural resources can be divided into two groups: renewable resources and non-renewable resources.
Renewable resources are ones that can be used again and again. For example, soil, sunlight and water are renewable resources.
A non-renewable resource is a resource that does not grow and come back, or a resource that would take a very long time to come back. For example, coal is a non-renewable resource.

Slide 3, Freshwater Resources
We know that water was included as a renewable resource; do we believe that freshwater is a renewable resource? Yes, it is! Unfortunately, sometimes water is not easily renewed. Fresh water is not evenly distributed around the world, and its availability is really important for where living things can exist. Getting enough fresh water is a serious problem in many places and water pollution is a world-wide problem affecting even areas with a large water supply. So, even though water is a renewable resource, the supply of fresh surface water is limited in some places.

So water is both a RENEWABLE and LIMITED resource.

Upper Primary:
Freshwater is a limited resource and this is due to its high demand. A limited resource is one that can run out; there might not be enough for everyone in the future. Humans make the water recycling process difficult for Mother Nature to keep up with. How do you all think that we as humans make it hard for Mother Nature to keep up with the water recycling process? As population and industries grow, the demand for water becomes too

high, which results in *water scarcity*. Water scarcity is a lack of drinkable water available in a given area.

Slide 4, Sources of freshwater in The Bahamas
Earlier we spoke about how water is unevenly distributed throughout the world, but water is also unevenly distributed right here throughout the islands of The Bahamas. The difference in our location affects where our water comes from. Here in The Bahamas we have multiple sources of freshwater, which vary, on the different islands.

Slide 5, Rainwater
Rainwater is a common source of freshwater; particularly on smaller islands and cays that do not have connection to any water utility company like the Water & Sewage Corporation (WSC). Some individual homes have special equipment (gutters) installed to collect rainwater that is stored in a tank for use. Rainfall decreases from north to south throughout the archipelago so this is not a good option for the more southern islands. For example, Inagua the southernmost island is practically a desert. Do you all know what a desert is? A desert is a barren area of land where there is barely any rain so it's hard for plant and animal life to thrive there because of the extreme conditions.

Slide 6, Groundwater
Groundwater is exactly what it sounds like; it is water found in the ground!

Groundwater is defined as water held underground. This water is either absorbed within the soil, or found in crevices in rock. The Bahamas bedrock is made up of a very porous rock called limestone. What do I mean by porous? Has anyone ever watched SpongeBob? Similar to SpongeBob or our average kitchen sponge, limestone absorbs, or sucks up and stores, water really well. When the freshwater from rain seeps into the ground it becomes trapped as ground water.
So how do we use this groundwater? Wells are dug to access the groundwater.

Slide 7, Blue holes
Has anyone in here ever been to a blue hole? Does anyone want to take a guess at what a blue hole is? A blue hole is just a flooded cave! So maybe at one point long, long ago the blue hole was once a dry cave but over time as sea levels rose it became filled with water.
There are two types of blue holes:

1) Ocean Holes- which is exactly what it sounds like blue holes found in the ocean (Dean's Blue Hole in Long Island- Second deepest blue in the world!)
2) Inland Blue hole- which are blue holes found on land, very popular to be found on the northernmost islands in the pine forest but are scattered throughout the archipelago.

Inland blue holes are the blue holes we are speaking about when talking about Bahamian freshwater resources. Inland blue holes are the ONLY source of surface freshwater in the

Bahamas! Surface water is water found on top of the Earth's surface like rivers, lakes, creeks, streams and other wetlands.

If you have ever been in an inland blue hole, what kind of water were you swimming in? Inland blue holes have multiple layers. Similar to groundwater, the very top layer of inland blue holes is made up of fresh water collected from rain. In the past, freshwater was harvested from this 'lens' to be used. Then there is brackish water, which is a mix of salt and freshwater, and at the very bottom is salt water.

Slide 8, The Ocean
Can you drink seawater? NO! However, there is a process that allows saltwater from the ocean to be converted into freshwater. So, in some cases freshwater can ever be considered an ocean resource.

The process that can be used to change seawater to freshwater is called Reverse Osmosis (RO). Reverse osmosis is how you can get small particles (salts) out of water by forcing it through a filter (a membrane). The particles in the water are left on the other side of the sheet, while the water travels through it.

Slide 9, 03 Past practices for accessing freshwater resources
Earlier we spoke about how water is unevenly distributed throughout the world, but water is also unevenly distributed right here throughout the islands of The Bahamas. The difference in our location affects where our water comes from. Here in The Bahamas we have multiple sources of freshwater, which vary, on the different islands.

Slide 10, Rainwater collection
As previously mentioned, rainwater collection was not a reliable source 1) all islands do not experience consistent rainfall 2) on islands that were more prone to rainfall, the rainfall is not consistent year round.

Slide 11, Inland blue holes
Inland blue holes are refuelled by rainfall. Once these features had been exploited, meaning pumped of fresh water before they could be replenished (filled back up), they were no longer reliable sources for freshwater.

Slide 12, Shallow dug wells
Shallow dug wells were used to harvest groundwater to be pumped throughout the islands for use. However, this was not the best way of harvesting water because these wells were more difficult to protect from contamination, and their yields were also very low because they do not penetrate into the reliable freshwater resources.

Slide 13, 04 Current Practices
We have spoken about the past practices for accessing (ways of getting) fresh water; now, we will discuss the current practices. Primarily, past practices were abandoned because of their overuse and damaging of our natural water resources. Improved technology has also played a large part in our ability to make these transitions.

Slide 14, Reliance on ground water
Islands with larger and more readily accessible groundwater supplies like Grand Bahama, Abaco and Andros still rely on groundwater. Well fields still exist where groundwater is gotten, treated and then pumped to consumers. On the island of Abaco, a well field in South Abaco is in the process of becoming fully powered by solar energy. In more southern islands, due to lack of groundwater supplies they are depending on reverse osmosis.

Slide 15, Freshwater supply challenges
What are some challenges that we face when sourcing freshwater supplies here in The Bahamas?

Slide 16, Challenge 1
A major challenge we face is that only 3 islands in The Bahamas have significant freshwater resources. Those islands are: Andros, Abaco and Grand Bahama.

Slide 17, Challenge 2
Another major challenge is that some islands and cays have no naturally existing freshwater resources that can supply their needs.

Slide 18, Challenge 3
Finally the greatest and most common challenge is man. Freshwater resources are easily destroyed by human activities. These activities include the dredging of canals, mining, digging of wells and pollution.

Slide 19, Every drop counts
Have you guys thought of ways we can conserve water? REMEMBER, Every drop counts!