**PAESTA Podcast Series – You Asked, We Answered**

**Episode 34 – What is a Mega-drought?**

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Greeting PAESTA podcast listeners! My name is Nick Draves, I am an undergraduate at Penn State Brandywine, and you are listening to “You Asked, We Answered.” This podcast was recorded on Nov. 11th, 2016.

One of the questions you asked is, what is a mega-drought? To better understand what a mega-drought is, I think we have to review what a drought is. To answer this question, we will take a look on how the United States Geological Survey or USGS, defines what a drought is. Though a drought has many definitions depending on the point of view from the person, a drought is a prolonged period when precipitation is less than normal [1]. Another question that needs to be answered is what can cause these extended periods of less than normal rainfall? Climate change is one of these answers. Climate change is a big factor on what can cause a drought. Scientists from the Union of Concerned Scientists noted that with the rise of the temperature over the years, the drought that is present in the western part of the United States has increased. They also noted that with the rise of the temperature, it causes precipitation, that would normal be snowfall, turn into rain, which reduces snowmelt, causing a loss of runoff from the snowmelt [2].

After reviewing what a drought is and what can cause a drought, we can really get into what a mega-drought is. [3] According to Doyle Rice, of USA Today, a mega-drought is a drought that takes place for decades or longer. The name does not have to do about the intensity of the drought, but more of the length of the drought. Even though these droughts may not have been that intense, the length and frequency of them have caused mass migration of humans in the past. [4] The most well-known mega-drought is the medieval mega-drought, which was a series of droughts that lasted from 900AD to 1400AD. Scientists were able to date the droughts from dead tree stumps they found in the bottom of rivers in the Sierra Nevada. [4] Scott Stine and his team were able to date these dead stumps by using carbon dating. The dead tree stumps were dated to the medieval period. These trees were able to thrive in the valleys of the Sierra Nevada because the drought kept the river bed dry for so many years.

The National Oceanic and Atmospheric Administration, or NOAA, has been observing drought behavior for quite some time now. NOAA observes that droughts of the magnitude of the Dust Bowl and the drought in the 50's happen once or twice a century [5]. With the global warming and greenhouse effects in place, the variability could prove a more severe drought in the future, such as a mega drought. If we can expect about two droughts a century, how can we prepare ourselves against these mega-droughts? What can we do in order to ready ourselves? To combat the droughts, the Scientists over at the Union of Concerned Scientists give a few tips on how we can prepare for the increased risk of more frequent and severe droughts. We should better the systems we use for the technology we use to monitor and measure the water supply and water use, nationwide. Water is essential to every living thing. We need to reduce indoor water use through more efficient appliances, technologies, and behaviors. We also need to increase water efficiency through drought tolerant landscape design and improved irrigation technologies, such as resurrection plants, which can retain water for longer periods of time. We need to increase recycling and reuse of water, including capturing and reusing storm water, greywater, and wastewater. We already have the technology available for recycling wastewater, we just need to have the idea of it warm up to people [2].

With these tips from the Union of Concerned Scientists, we as a community, can help the cause of saving water. We can simply implement these tips into our daily routines. Not letting the faucet run while we brush our teeth or wash our hands, taking shorter showers, and by being more aware of the water we use every day, we can make note of where we can reduce the water we use at home. Thank you for listening to “You asked, We Answered”. My name is Nick Draves, and I hope this was as informative for you, as it was for me!

*(This audio file was recorded by Nick Draves on November 11th, 2016)*

**Works Cited**

[1] “Droughts: Questions and Answers (U.S. Geological Survey).” Accessed September 16, 2016. <http://water.usgs.gov/edu/qadroughts.html>.

[2] “Causes of Drought: What’s the Climate Connection? | Union of Concerned Scientists.” Accessed September 16, 2016. http://www.ucsusa.org/global\_warming/science\_and\_impacts/impacts/causes-of-drought-climate-change-connection.html#.V9s3QTV0bUg.

[3] Rice, Doyle. “Causes of Drought: What’s the Climate Connection? | Union of Concerned Scientists.” Accessed September 16, 2016. http://www.ucsusa.org/global\_warming/science\_and\_impacts/impacts/causes-of-drought-climate-change-connection.html#.V9s3QTV0bUg.

[4] “The Characteristics and Likely Causes of the Medieval Megadroughts in North America.” Accessed September 6, 2016. <http://ocp.ldeo.columbia.edu/res/div/ocp/drought/medieval.shtml>.

[5] Viets, Patricia. “DROUGHTS MORE SEVERE THAN DUST BOWL LIKELY, NOAA REPORTS.” *NOAA*, December 15, 1998. <http://www.publicaffairs.noaa.gov/pr98/dec98/noaa98-90.html>.