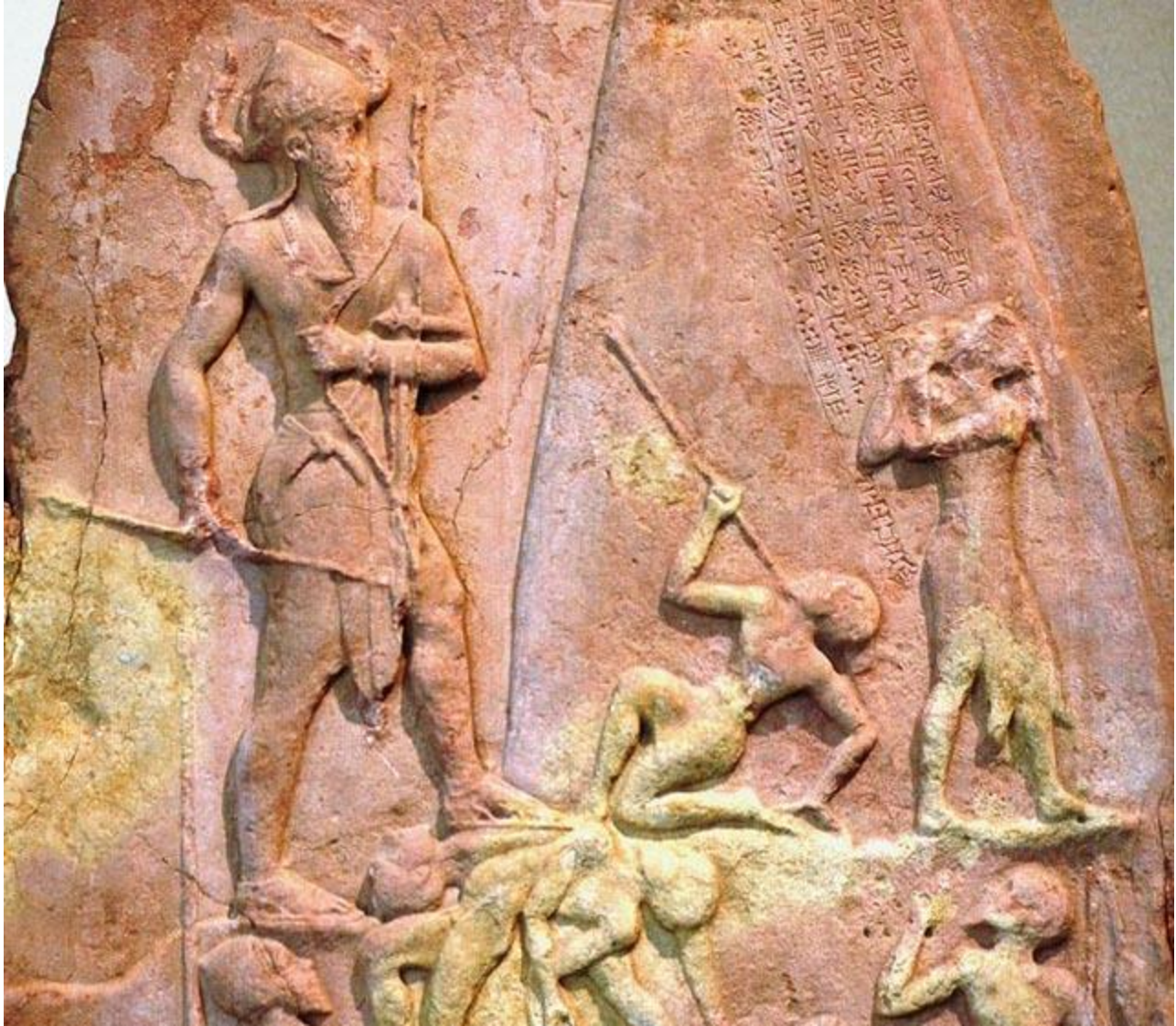


Ten Civilizations or Nations That Collapsed From Drought

By: Jeff Masters, 3:15 PM GMT on March 21, 2016

Drought is the great enemy of human civilization. Drought deprives us of the two things necessary to sustain life--food and water. When the rains stop and the soil dries up, cities die and civilizations collapse, as people abandon lands no longer able to supply them with the food and water they need to live. While the fall of a great empire is usually due to a complex set of causes, drought has often been identified as the primary culprit or a significant contributing factor in a surprising number of such collapses. Drought experts Justin Sheffield and Eric Wood of Princeton, in their 2011 book, *Drought*, identify more than ten civilizations, cultures and nations that probably collapsed, in part, because of drought. As we mark World Water Day on March 22, we should not grow overconfident that our current global civilization is immune from our old nemesis--particularly in light of the fact that a hotter climate due to global warming will make droughts more intense and impacts more severe. So, presented here is a "top ten" list of drought's great power over some of the mightiest civilizations in world history--presented chronologically.



Collapse #1. The Akkadian Empire in Syria, 2334 BC - 2193 BC. In Mesopotamia 4200 years ago, the great Akkadian Empire united all the indigenous Akkadian-speaking Semites and the Sumerian speakers, and controlled Mesopotamia, the Levant, and parts of Iran, sending military expeditions as far south as present-day Oman. In a 2000 article published in *Geology*, "[Climate change and the collapse of the Akkadian empire: Evidence from the deep sea](#)", a team of researchers led by Heidi Cullen studied deposits of continental dust blown into the Gulf of Oman in the late 1990s. They discovered a large increase in dust 4200 years ago that likely coincided with a 100-year drought that brought a 30% decline in precipitation to Syria. The drought, called the [4.2 kiloyear event](#), is thought to have been caused by cooler sea surface temperatures in the North Atlantic. The 4.2 kiloyear event has also been linked to the collapse of the Old Kingdom in Egypt (see below). The paper concluded, "*Geochemical correlation of volcanic ash shards between the archeological site and marine sediment record establishes a direct temporal link between Mesopotamian aridification and social collapse, implicating a sudden shift to more arid conditions as a key factor contributing to the collapse of the Akkadian empire.*" In this image, we see Stele of Narâm-Sîn, king of the Akkadian Empire, celebrating his victory against the Lullubi

from Zagros. Limestone, c. 2250 BC, Louvre Museum. Image credit: [Marie-Lan Nguyen](#).



Collapse #2. [The Old Kingdom](#) of ancient Egypt, 4200 years ago. The same drought that brought down the Akkadian empire in Syria severely shrank the normal floods on the Nile River in

ancient Egypt. Without regular floods to fertilize the fields, poor harvests led to reduced tax income and insufficient funds to finance the pharaoh's government, hastening the collapse of Egypt's pyramid-building Old Kingdom. An inscription on the tomb of Ankhtifi during the collapse [describes](#) the pitiful state of the country when famine stalked the land: *"the whole country has become like locusts going in search of food..."* In this image, we see two great structures from the Old Kingdom: The Pyramid of Khafre and the Great Sphinx of Giza. Image credit: wunderphotographer [Jeff41](#).



Collapse #3. The Late Bronze Age (LBA) civilization in the Eastern Mediterranean. About 3200 years ago, the Eastern Mediterranean hosted some of the world's most advanced civilizations. The Mycenaean culture was flourishing in Greece and Crete. The chariot-riding Hittites had carved out a vast empire encompassing a large part of Asia Minor and the Middle East. In Egypt, the New Kingdom was at its height. However, around 1200 BC, these Eastern Mediterranean civilizations declined or collapsed. According to a [2013 study in PLOS](#), studying grains of fossilized pollen shows that this collapse coincided with the onset of a 300-year drought event. This climate shift caused crop failures and famine, which *"precipitated or hastened socio-economic crises and forced regional human migrations at the end of the LBA in the Eastern*

Mediterranean and southwest Asia." In this image, we see the fall of Troy (complete with the famed Trojan Horse), an event recounted in Greek mythology at the end of the Bronze Age, as represented by the 17th century painter Kerstiaen De Keuninck. Image credit: [Wikipedia Commons](#). [see also <https://www.youtube.com/watch?v=bRcu-ysocX4> for a more rounded view.]



Collapse #4. [The Maya civilization](#) of 250 - 900 AD in Mexico. Severe drought killed millions of Maya people due to famine and lack of water, and initiated a cascade of internal collapses that destroyed their civilization at the peak of their cultural development, between 750 - 900 AD. Haug, G.H. *et al.*, in their 2003 paper in *Science*, "Climate and the collapse of Maya

civilization," documented substantial multi-year droughts coinciding with the collapse of the Maya civilization. In this image, we see the Mayan ruins at Xunantunich. Image credit: [wunderphotographer novembergale](#).

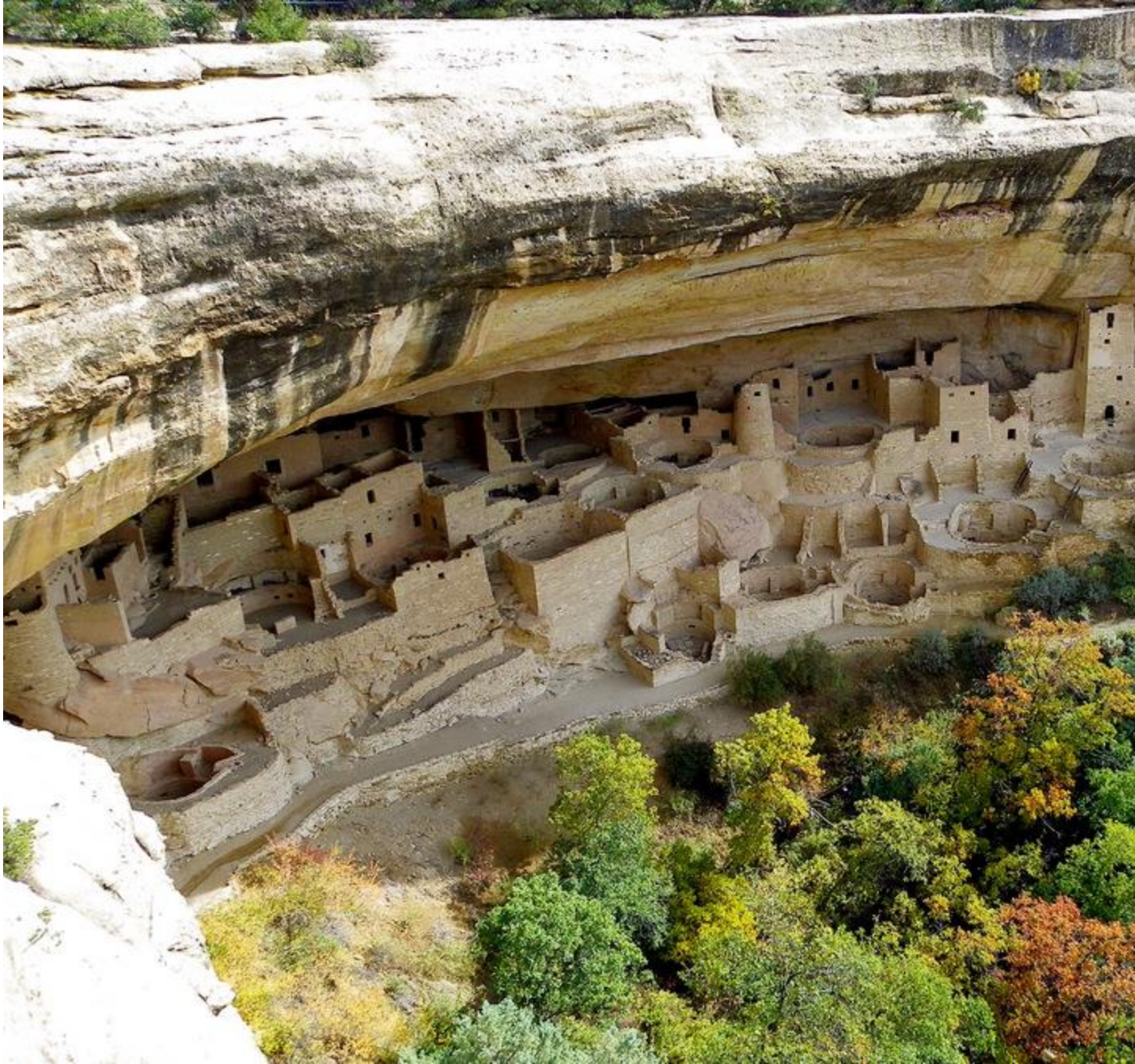


Collapse #5. The Tang Dynasty in China, 700 - 907 AD. At the same time as the Mayan collapse, China was also experiencing the collapse of its ruling empire, the Tang Dynasty. Dynastic changes in China often occurred because of popular uprisings during crop failure and famine associated with drought. The Tang dynasty--a golden age of literature and art in Chinese civilization--began to weaken in the eighth century, and it fully collapsed in 907 AD. Sediments from Lake Huguang Maar in China dated to the time of the collapse of the Tang Dynasty indicate a sudden and sustained decline in summertime monsoon rainfall. Agriculture in China depends upon the summer monsoon, which supplies about 70% of the year's rain in just a few months. A 2007 article in *Nature* by Yancheva *et al.* speculated that "*migrations in the tropical rain belt could have contributed to the simultaneous declines of both the Tang dynasty in China and the Classic Maya in Central America.*" In this image, we see the world's largest sitting Buddah, the 71-metre (234-feet) tall Leshan Giant Bubbha, built in 713 AD in the Chinese Tang Dynasty, in China's southwestern city of Leshan, in Sichuan province. Image credit: Liu

Jin/AFP/Getty Images.



Collapse 6. The [Tiwanaku Empire](#) of Bolivia's Lake Titicaca region, 300 - 1000 AD. The Tiwanaku Empire was one of the most important South American civilizations prior to the Inca Empire. After dominating the region for 500 years, the Tiwanaku Empire ended abruptly between 1000 - 1100 AD, following a drying of the region, as measured by ice accumulation in the Quelccaya Ice Cap, Peru. Sediment cores from nearby Lake Titicaca document a 10-meter drop in lake level at this time. In this image, we see tourists exploring the Tiwanaku archaeological site in Tiahuanaco, Bolivia. Image credit: AIZAR RALDES/AFP/Getty Images.



Collapse 7. [The Ancestral Puebloan](#) (Anasazi) culture in the Southwest U.S. in the 11th - 12th centuries AD. Beginning in 1150 AD, North America experienced a 300-year drought called the Great Drought. This drought has often been cited as a primary cause of the collapse of the ancestral Puebloan (formally called Anasazi) civilization in the Southwest U.S., and abandonment of places like the Cliff Palace at Mesa Verde National Park in Colorado. The Mississippian culture, a mound-building Native American civilization that flourished in what is now the Midwestern, Eastern, and Southeastern United States, also collapsed at this time. Cliff Palace image credit: [wunderphotographer Amtnsprit](#).



Collapse #8. The Khmer Empire based in Angkor, Cambodia, 802 - 1431 AD. The Khmer Empire ruled Southeast Asia for over 600 years, but was done in by a series of intense decades-long droughts interspersed with intense monsoons in the fourteenth and fifteenth centuries that, in combination with other factors, contributed to the empire's demise. The climatic evidence comes from a seven-and-a-half century reconstruction from tropical southern Vietnamese tree rings presented in a 2010 study by Buckley *et al.*, "[Climate as a contributing factor in the demise of Angkor, Cambodia](#)". They wrote: "*The Angkor droughts were of a duration and severity that would have impacted the sprawling city's water supply and agricultural productivity, while high-magnitude monsoon years damaged its water control infrastructure.*" In this image, we see the ruins of Baphuon, a temple-mountain dedicated to the Hindu God Shiva in Angkor. Image credit: [Jean-Pierre Dalbéra](#).



Collapse #9. The Ming Dynasty in China, 1368 - 1644 AD. China's Ming Dynasty--one of the greatest eras of orderly government and social stability in human history--collapsed at a time when the most severe drought in the region in over 4000 years was occurring, according to sediments from Lake Huguang Maar analyzed in a [2007 article in Nature by Yancheva et al.](#) Drought experts Justin Sheffield and Eric Wood of Princeton, in their 2011 book, *Drought*, speculated that a weakened summer monsoon driven by warm El Niño conditions in the Eastern Pacific was responsible for the intense drought, which led to widespread famine. An inscription found carved on a wall of Dayu Cave in the Qinling Mountains of Central China dated July 10, 1596, during the 24th year of the Ming Dynasty's Emperor Wanli, said: *Mountains are crying due to drought.* In the image above, we see another inscription on the wall of the same cave from a much later drought in 1891. It reads: *"On May 24th, 17th year of the Emperor Guangxu period (June 30th, 1891 CE), Qing Dynasty, the local mayor, Huaizong Zhu led more than 200 people into the cave to get water. A fortuneteller named Zhenrong Ran prayed for rain during a ceremony."* Image credit: [L. Tan](#).



Collapse #10. Modern Syria. Syria's devastating civil war that began in March 2011 has killed over 300,000 people, displaced at least 7.6 million, and created an additional 4.2 million refugees. While the causes of the war are complex, a key contributing factor was the nation's devastating drought that began in 1998. The drought brought Syria's [most severe set of crop failures in recorded history](#), which forced millions of people to migrate from rural areas into cities, where conflict erupted. This drought was almost certainly Syria's worst in the past 500 years (98% chance), and likely the worst for at least the past 900 years (89% chance), according to a 2016 tree ring study by Cook *et al.*, "[Spatiotemporal drought variability in the Mediterranean over the last 900 years.](#)" Human-caused emissions greenhouse gases were "a key attributable factor" in the drying up of wintertime precipitation in the Mediterranean region, including Syria, in recent decades, as discussed in a [NOAA press release](#) that accompanied a 2011 paper by Hoerling *et al.*, [On the Increased Frequency of Mediterranean Drought](#). A 2016 paper by drought expert Colin Kelley showed that the influence of human greenhouse gas emissions had made recent drought in the region 2 - 3 times more likely. Wunderground's climate change blogger, Dr. Ricky Rood, has his take on the current drought in Syria in his March 21 post, [Ineffective Resolution: Middle East and Climate Change](#). In this image, we see Kurdish Syrian girls among destroyed buildings in the Syrian Kurdish town of Kobane on March 22, 2015. Image credit:

Yasin Akgul/AFP/Getty Images.

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