



# CLIMATE CHANGE AND WATER/WASTEWATER UTILITIES: PART 1

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During our 36th Annual Technical Conference & Exhibition this year, I presented a session entitled “Potential Climate Change and Your System”. For those of you who missed this talk (the very last of our three-day event), I will give you the highlights of the first part of my presentation in this article. The U.S. Environmental Protection Agency (EPA) has developed a great deal of information on this subject as it relates to drinking water, wastewater, and stormwater utilities. I encourage you to visit their website: <http://water.epa.gov/infrastructure/watersecurity/climate/index.cfm>.

## WHAT DO YOU BELIEVE?

Before I get started, I have to ask: do you believe our climate is changing? Recent polls that I have researched (a Pew Research Center poll and a Yale/Gallup/Clearvision poll) indicate that anywhere between 61 to 78 percent of Americans believe that climate change is occurring (specifically global warming). Personally, as a geologist, I know that the Earth’s climate has fluctuated widely over its history and just 12,000 years ago (a blink of an eye in geological time) we were in an ice age. You cannot argue with the fact that there has been an average increase in global temperatures of 1.5 degrees Fahrenheit since the 1880’s. Whether the cause is human activity or natural variability, it is a fact that our climate is changing.

## HOW IS OUR CLIMATE CHANGING?

One or two degrees on average is not a big deal right? Wrong. First, a change in mean global temperatures of 1 to 2 degrees can have a dramatic local impact on some regions. For example, scientists believe that a 1 to 2 degree drop in global temperatures triggered a period of unusually colder temperatures in medieval Europe known as the Little Ice Age. Second, an increase of 1 to 2 degrees doesn’t mean average temperatures rose everywhere uniformly. Temperatures may rise several degrees in one region and drop a few degrees in another.

I have caught myself asking the same question others ask all of the time: we had some rough snow storms last winter, so what happened to global warming? The truth is that day-to-day weather is projected to remain about the same, but extreme events will become more extreme. As EPA’s indicates in its document entitled “Adaptation Strategies Guide for Water Utilities”, here in the Northeast, winters are projected to be shorter on average with fewer cold days and more precipitation. However, as EPA indicates, cold-season storm tracks are shifting northward, and the strongest storms are likely to become stronger and more frequent. Here, heavy downpours are likely to occur more frequently. Peak river flows are anticipated to occur earlier. Short-term droughts lasting from 1 to 3 months are projected to occur as frequently as once each summer in many parts of the region.

## HOW DOES CLIMATE CHANGE AFFECT UTILITIES?

Figure 1 is a table from the EPA’s document “Adaptation Strategies Guide for Water Utilities”. For drinking water utilities (DW in the table), the most significant challenges are from flooding. We certainly have seen this in recent years. However, changes in the timing of seasonal runoff, reduced snowpack, and higher summer temperatures will likely increase the incidences and impacts of short-term droughts. Higher summer temperatures mean greater future water demand.

Wastewater utilities (WW in the table) will also be impacted. Flooding will continue to be problematic. However, stream flows are likely to be even more variable in the future, with more incidences of low flow conditions. Of course, with an increase in average water consumption due to higher temperatures, wastewater plants will experience greater flows than they have historically experienced.

CHALLENGES BY GROUP		DW	WW
Drought	Reduced groundwater recharge	🔵	
	Lower lake and reservoir levels	🔵	
	Changes in seasonal runoff & loss of snow-pack	🔵🔵	
Water Quality Degradation	Low flow conditions & altered water quality		🔵🔵
	Saltwater intrusion into aquifers	🔵	
	Altered surface water quality	🔵	🔵
Floods	High flow events & flooding	🔵🔵	🔵🔵
	Flooding from coastal storm surges	🔵🔵	🔵🔵
Ecosystem Changes	Loss of coastal landforms / wetlands	🔵🔵	🔵🔵
	Increased fire risk & altered vegetation	🔵	🔵
Service Demand & Use	Volume & temperature challenges	🔵🔵	🔵🔵
	Changes in agricultural water demand	🔵	
	Changes in energy sector needs	🔵	
	Changes in energy needs of utilities	🔵🔵	🔵🔵

🔵🔵 = Particularly relevant to Northeast   🔵 = Somewhat relevant

## NEXT ARTICLE

Helping your utility to address climate change involves a combination of emergency response planning, capacity development, capital investment planning, water supply and demand planning, conservation practices, and infrastructure maintenance. I will be discussing these items in the next issue of Aquafacts. 🔵🔵