Groundwater in Greater Boston threatened by climate change, 'should not be overlooked,' research shows

By Dharna Noor Globe Staff, Updated December 22, 2022, 10:47 a.m.

Jake Ryan, a field engineer with the Boston Groundwater Trust, used a water level meter to take a measurement of the groundwater level at a test well in the Fenway. JESSICA RINALDI/GLOBE STAFF

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Climate change will deplete groundwater levels across the Greater Boston area after 2030, putting drinking water, plants, wildlife and infrastructure at risk, a recent report shows.

Groundwater seeps underground through cracks and spaces in soil, sand, and rock. In recent years, the study says, groundwater levels have actually been increasing on average, thanks to the increased frequency and severity of rainstorms.

After 2030, researchers at the University of Massachusetts Boston School for the Environment predict that groundwater recharge rates will continue to rise in fall and early winter due to projected increases in precipitation. But as temperatures

rise in the springtime, the study's authors expect recharge rates will decrease substantially.

On warmer days, more water evaporates from the ground. Exacerbating the problem: Winters will get shorter and warmer, leading to decreases in snowmelt, and springtime growing seasons could also lengthen, meaning plants will absorb more water through their roots and leave less moisture in to seep into the ground.

Without action to curb planet-warming pollution, the rate at which groundwater replenishes in the spring could decrease by up to 28 percent in some parts of the Greater Boston area by the end of the century. Rural communities outside Boston will be hit hardest, while the changes will be less dramatic in cities where impervious surfaces like concrete already block water from seeping into the ground, the authors say.

Groundwater depletion could have disastrous consequences. It could threaten drinking water supplies, especially in Middlesex, Norfolk, and Plymouth Counties, and it could leave plants and wildlife parched. It could also threaten the foundations of some Boston buildings, because a swath of the city is built on wood pilings which are strong as long as the ground stays wet, but can decay and become brittle when they're exposed to air as groundwater levels drop.

The new report is part of the Greater Boston Research Advisory Group research partnership, which is based at UMass Boston and focuses on studying climate impacts across 101 municipalities across the Metropolitan Area Planning Council. It follows another Greater Boston Research Advisory Group study released earlier this year, which found that if the world fails to act on climate change, average temperatures in the Boston area could increase as much as 10 degrees above 2000 levels, while seas could rise more than 15 feet.

Groundwater changes haven't garnered as much attention as other climate impacts like temperature increases, precipitation shifts, and sea level rise. But the problem, the study said, "should not be overlooked."

"Groundwater, while out of sight and slow moving, is an important resource for drinking water and ecosystems alike," said Jayne Knott, an environmental consultant and adjunct research scientist at the University of Massachusetts Boston School for the Environment, who co-authored the paper. "Researchers and policymakers must consider projected changes to our groundwater systems caused by climate change when managing their water supplies and water withdrawals. Water is a finite resource."

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The real issue is whether or not humans are willing to make a few changes so that the ecosystems we depend upon will continue to support life. Right now the freight train to oblivion seems to be winning.

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