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Global climate change is not a new concern as it was brought to the international stage in the 1980s and has been confronted by deniers ever since. Research devoted to climate change mitigation and solutions has been gaining traction as its irrefutable reality becomes ever more a concern. In January 2021, Defense Secretary Lloyd Austin was quoted saying: "There is little about what the Department does to defend the American people that is not affected by climate change. It is a national security issue, and we must treat it as such."

One of the ways in which climate change will affect daily life and national security is reliable access to safe drinking water. The United Nations has already stated that two thirds of the world's population could be under water "stress conditions" by the year 2025. While this reality on a global scale is frightening, states and communities on a smaller scale can adjust their approach to water resource management and face climate change head on. In our region, two pressing issues that should be explored are increased flooding and associated stormwater management.

The average elevation in Washington, DC is 150 feet, while my home in Riverdale Park is just 13 feet above sea level. As increasing the topographical elevation of the region is out of the question, our infrastructure must be prepared for the increase in extreme weather events. One such event in recent memory is September 10th, 2020 when 4.1" of rain fell in one hour in Hyattsville, MD and by day's end, 6" were reported. Route 50 had essentially become a river, normal 20-minute commutes took six times as long, basements were inundated, and the communities were left with almost \$3 million in damages.

How can utilities protect residents and pursue bold measures to prevent flooding without potentially increasing monthly bills and annual taxes? By re-prioritizing future infrastructure projects. Realistically, methods of flood reduction could be implemented when regular system repairs are performed in the wide network of pipes that WSSC maintains. Another such focus could be the re-fortification of the WSSC dams and reservoirs, especially the T. Howard Duckett dam. In a 2010 Prince George's County Hazard Mitigation Plan, the authors state that the dam/reservoirs are "managed to optimize water supplies, not as a flood control system." This management style needs to be redirected towards flood mitigation strategies, for example the utilization of groundwater wells to maximize water retention in the Duckett dam. All improvements made to existing WSSC structures and all future WSSC projects must consider the research-backed modeling predictions that extreme precipitation events will increase in the future. Like a diversified stock portfolio, having a large asset pool of water resource management techniques can be a significant fortification towards future resilience. These improvements can be designed using blue-green infrastructure.

Blue-green infrastructure (BGI) is an emerging urban planning technique designed to allow the water cycle to occur within a city or community, specifically to reduce flood risks. As the name implies, this infrastructure style couples blue infrastructure (urban hydrological systems) to green infrastructure (vegetation systems) within traditionally paved areas. In a 2019 report prepared for Washington DC's Department of Energy and the Environment, several infrastructure plans were presented as a toolbox for the District to utilize in future. Just a few of the designs from this toolbox include cloudburst roads and pipes which are slanted inwards to channel and direct water,

retention alleys which slow peak flow of water and retention boulevards which retain water between opposite lanes of traffic (as boulevards already do), allowing for the retention/detention of stormwater. Another consideration to make is the inherent issue regarding the combined sewer overflow system that exists in the region. As previously mentioned, this region will continue to experience precipitation events of greater intensity and length as well as higher water levels, which can already be seen in DC's Haines Point and Bladensburg Waterfront Park. These impending threats are why it is imperative for the combined sewer system to be revamped to a more robust system that does not impair water quality after severe rain events. While WSSC is obviously not in charge of total infrastructure planning, it is one of the largest water/wastewater utilities in the nation, serving roughly 1.8 million residents through over 11,000 miles of water mains and sanitary sewers, and thus, can influence decisions in a sustainable direction.

WSSC must work in tandem with all the communities they serve when repair and construction work is underway. Implementing BGI methods during repairs and future construction work could be an effective method to "future-proof" critical WSSC infrastructure for years to come. Blue-green infrastructure is just one of many methodologies for addressing the forthcoming difficulties brought about by anthropogenic climate change. It could be an effective arrow in a whole quiver used in the ongoing battle against rising sea levels and increased extreme weather events that threaten our way of life. It is my hope that innovative approaches of the impending crisis are pursued in research groups and water utilities across the region and the nation.