Detention Basin Systems: Mitigating Stormwater in Hampden Heights and Its Implications on Cherry Creek Water Quality

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Sustainable urban planning is essential to the future of cities and the harmony of humans and the environment. Increased urban infrastructure creates more area of impermeable surfaces, leading to increased floods, runoff, and pollution in stormwater. Denver is currently developing bioretention and detention ponds across the city to mitigate this issue, and to make cities congruous with the natural landscape. This project observes the water levels of a detention basin in Hampden, Colorado, that collects stormwater from a large portion of the neighborhood adjacent to Hampden Heights - where the research took place. The goal of the project is to investigate the efficacy of the anthropogenic system at filtering, absorbing, and draining stormwater from this area. The project will highlight the different levels of contaminants including nitrates, phosphates, and coliform bacteria, which will exhibit increased anthropogenic pollution in the water. The research is expected to prove that these pollutants will have higher levels in the trash vault and bioretention pond, and the levels will decrease at the overflow pond and in the river to demonstrate accurate filtration of the pollution. However the data revealed that the anthropogenic pollution levels stayed fairly consistent throughout the entire system, which can be attributed to the collection of fine particulates in total suspended solids measurements, which create a cap on the bottom of the detention pond and limit the infiltration of water. This project will contribute valuable insight on the further development of green infrastructure such as detention basins in Denver and across the world.