PennState

sustainability INSTITUTE

sustainable communities collaborative

Semester: Spring 2021
Class: Biological Engineering (BE) 460W, 466W
College: College of Agricultural Sciences
Faculty: Dr. Megan Marshall and Dr. Jeffrey Catchmark
Community Partner: Castle Shannon Borough

Impact: A clean, updated basin for the Shannon Heights housing development that can effectively manage stormwater for the development with pollutant-free water and healthy ecosystems for animals

The Shannon Heights housing development in Castle Shannon, uses a drainage basin for stormwater management to protect the neighborhood from flooding. In the past couple years, the detention pond has experiences problems with pollution and effectiveness. The students of BE 460W and 466W partnered with Castle Shannon Borough to evaluate the basin and design a solution to increase time of concentration and reduce pollutants. In their designs, the students considered functionality, cost, and policies/regulations. The students considered the sustainability impacts of the pond and how their designs related to the Sustainable Development Goals (SDGs). To support Life Below Water (SDG 14), the students planned to remove pollutants to protect aquatic life and prevent algal blooms. The pond retrofit would also create a habitat for wildlife, supporting SDG 15, Life On Land. It also contributed to SDG 11, Sustainable Cities and Communities, by removing pollutants and reducing environmental impacts in the neighborhood. The final design recommended regrading the bottom of the basin, expanding the outflow structures, and implementing a bioswale. With these recommendations, the basin will be able to effectively manage stormwater, create a habitat for wildlife, and be free of pollutants.

"The Sustainable Communities Collaborative allowed us to explore more deeply what sustainability means within a community. We loved interacting in a real-world setting to evaluate the needs of sponsors and community members, all while working to promote sustainability. We learned how to approach real-world scenarios and create solutions that will have a lasting impact for future generations." - Castle Shannon Student Team