Abstract

The impact of human activities on watercourses has led to increased contamination, eutrophication, erosion and reduced biodiversity in streams and rivers. Increased urbanization is one of the factors that may influence the water quality. Wet stormwater ponds are a commonly used buffer structure to delay and treat the water before it reaches the recipient – often streams as studied in this paper. However, knowledge on how stormwater outlets from wet ponds may affect downstream recipients is still limited. We studied the impact of six outlets from wet stormwater ponds to streams in 2016 and 2017, by measurements in the streams upstream and downstream of the outlet. The aim was to study possible effects on physical conditions, sediment grain size and invertebrate community composition. The Fauna Index showed no significant differences between upstream and downstream stations. However, we found a significant decrease in biodiversity (Shannon-Wiener) and a significantly lower evenness downstream of the stormwater outlets, even though the water was delayed and treated in a pond first. The physical conditions were both positively and negatively affected depending on the specific outlet. Finally, the smallest particle fraction (<63µm) in the stream sediments was reduced at downstream sites compared to upstream sites at four outlets indicating possible erosion effects. Our study shows that the stormwater outlets have an effect on the recipients, but whether it is measurable depends on the methods utilized.

Keywords

urban runoff; hydraulic load; SUDS; water management; invertebrates; rainwater