Sediment Transport through Historic Mill Dams of the Christina River Basin

Student: Kim Teoli
Advisor: Dr. James Pizzuto

Abstract

The study explores the temporal and spatial effects of historic run-of-river dams in the Christina River Basin. The objective of this study was to determine if sediment accumulates to facilitate the transport of bed material from upstream through the impoundment, at steady-state, without net deposition. It also aims to determine if run-of-the-river mill dams accumulate sedimentary materials of differing size classes in distinctive patterns after they have been in place for many decades. Methods included surveying, grain size analysis, and wet sieving techniques. Our results showed that sediment of all grain sizes were present both upstream and downstream of the dam. Generally, the dam is immediately followed by a scour hole lined with boulders, which is proceeded by a mid-channel bar. It was determined that the volume of the mid-channel bar is greater than the volume of the scour hole. In conclusion, bed material of all grain size fractions are being transported through the impoundment. Over time, a steady state is reached in the impoundment, without net deposition. The impoundment also appeared to influence soil composition in the affected floodplain.