

عنوان مقاله:

Effects of Urbanization on Stream Channels

محل انتشار:

اولین همایش ملی مهندسی مسیلهها (کالها) (سال: 1385)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

In response to urbanization, stream channels can undergo substantial changes, especially if channel stabilization measures are not instituted in the early stages of urbanization. Urbanization causes (1) significant increases in peak discharges, total runoff volume, and frequency of bank-full discharges; (2) the steepening of channel slopes if and where natural channels are straightened to accommodate new development; (3) reduction in sediment bed load from fully developed areas; and (4) eroding and degrading natural channels. These factors, in combination, create conditions that are conducive to channel instability—widening (erosion) and deepening (degradation) in most reaches and debris and sediment accumulation (aggradation) in others. To fully evaluate the proper channel morphological processes when undertaking a basic design or protective measure project, it is necessary to have some knowledge of channel stability concepts. The normal objective of channel stability evaluation is identification of principal channel hydraulic parameters influencing the stability of the channel. After identifying these parameters under existing channel conditions, the values of these parameters under future conditions are estimated. For areas undergoing urbanization, one of the most important changes is an increase in the volume, frequency, and flow rates of water in main channels. Stability analysis is then performed based on hydraulic parameters for anticipated future conditions, and stabilization measures are planned to minimize potential channel erosion under future conditions. There are a number of quantitative methods of channel stability analysis available to the designer including allowable velocity methods, tractive force calculations, and Leopold channel configuration relationships, among others. The hallmark of urbanization is increased imperviousness. Planning of a major drainage system must account for changes in hydrology, hydraulics, and channel stability that urbanization produces. As a result, the design of the major drainage system must be based on fully urbanized conditions to assure adequate capacity for conveyance of the major (e.g., 100-year) flood event. It is also important to recognize that the higher sediment loads during the process of urbanization (during construction) may shift the channel toward an equilibrium state that is different from the desired .stable channel balance for the urbanized basin

کلمات کلیدی:

Stream Channels; Major Drainage; Initial Drainage; Urbanization

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