

Conceptual Model for Three Basic Watershed Types and the Corresponding Flood Plain Morphologies in Southern California

David Dust¹ and Brian Bledsoe

Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, CO

Abstract. With the overall goal of better understanding changes in flood plain morphology due to urbanization, three basic watershed types have been identified and defined in terms of the corresponding flood plain morphologies, based on field data collected at 30 sites in southern California. Each of these three basic watershed types are defined by a typical downstream sequence of 3 to 6 distinct alluvial flood plain types, including cascade, step-pool, plane-course-bed, plane-mixed-bed, plane-fine-bed, pool-riffle, braided, and/or dune-ripple. A conceptual model is proposed that defines the interrelationship between the three basic watershed types based on dominant climatic and lithologic characteristics. Utilizing available Geographical Information System (GIS) data, indices for the dominant climatic and lithologic characteristics have been identified and a practical GIS based technique for predicting the basic drainage basin type and corresponding flood plain morphology within a drainage basin has been developed. Since changes in flood plain morphology due to urbanization can vary significantly depending upon the watershed type, the conceptual model for the three watershed types and corresponding flood plain morphologies provides a framework for evaluating the impact of urbanization on watercourses in southern California.

¹ Tel: (970) 266-8048

e-mail: ddust@colostate.edu