ABSTRACT

Ever-increasing demand on Earth's finite natural resources and land requires environmental planners to employ informed and successful management of environments. Historical resources enhance environmental management by providing information to compare past landscapes to contemporary, urbanized states. In this study, heterogeneous historical resources were converted into GIS datasets to reconstruct the Ballona Creek watershed in Los Angeles, California as a three-dimensional (3D) model. To develop the 3D terrain, contour lines were extracted from early 20th century United States Geological Survey (USGS) topographic maps. Transforming contour lines into a Digital Elevation Models (DEM) enabled creation of 3D models to visualize the terrain of the Ballona Creek watershed before the region was heavily urbanized. To increase the effectiveness and functionality of these models, 3D vegetation and hydrography features were also added to the terrain to "paint a picture" of the historic extent of the Ballona Creek watershed. The historic 3D topography allowed calculation of elevation changes occurring over the last century to the Ballona Creek watershed and provided visualizations of previously reconstructed historical habitats. These visualizations and associated analyses comparing historic and current conditions provide a historical perspective for environmental planners to identify landscape changes and current trajectories of urbanized landscapes. These results suggest that 3D visualizations models, synthesized from an array of historical resources, can effectively deliver information about past landscapes to environmental planners, decision makers, and the public.