



Hydrology and sediment budget of Los Laureles Canyon, Tijuana, MX: Modelling channel, gully, and rill erosion with 3D photo-reconstruction, CONCEPTS, and AnnAGNPS

Kristine Taniguchi (1), Napoleon Gudiño (2), Trent Biggs (1), Carlos Castillo (3), Eddy Langendoen (4), Ron Bingner (4), Encarnación Taguas (3), Douglas Liden (5), and Yongping Yuan (5)

(1) San Diego State University, San Diego, CA, United States, (2) CICESE, Mexico, (3) University of Córdoba, Córdoba, Spain, (4) US Department of Agriculture, United States, (5) US Environmental Protection Agency, United States

Several watersheds cross the US-Mexico boundary, resulting in trans-boundary environmental problems. Erosion in Tijuana, Mexico, increases the rate of sediment deposition in the Tijuana Estuary in the United States, altering the structure and function of the ecosystem. The well-being of residents in Tijuana is compromised by damage to infrastructure and homes built adjacent to stream channels, gully formation in dirt roads, and deposition of trash. We aim to understand the dominant source of sediment contributing to the sediment budget of the watershed (channel, gully, or rill erosion), where the hotspots of erosion are located, and what the impact of future planned and unplanned land use changes and Best Management Practices (BMPs) will be on sediment and storm flow. We will be using a mix of field methods, including 3D photo-reconstruction of stream channels, with two models, CONCEPTS and AnnAGNPS to constrain estimates of the sediment budget and impacts of land use change. Our research provides an example of how 3D photo-reconstruction and Structure from Motion (SfM) can be used to model channel evolution.