

Seismic Dam Break & Damage Modeling

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Abstract. Hydrodynamic models that simulate flooding and predict damage losses are necessary to support agencies involved in flood risk management plans through the usage of flood extent maps and damage assessments. In terms of dam break floods in urban areas, precise and accurate methods to predict flood extent and damage losses are crucial in areas where high population regions exist and where structures such as residential, commercial and public facilities exist, and, where aging hydraulic structures such as flood control dams are of concern. In our study, we have developed models to test earthquake-related failure scenarios for all federal flood control structures located in the Los Angeles County Drainage Area (LACDA) including Brea, Fullerton, Hansen, Lopez, Santa Fe, Sepulveda, and Whittier Narrows dams. Using information gathered from Water Control Manuals, on-site visits to the dams, as well as GIS data from USGS National Map, USC Geoportal, and LA County GIS, we have developed dam break flood extents and damage zone maps for different earth shaking scenarios. Results were compared with flood extents maps as computed by USACE and damage zones were evaluated to determine high zones of intense damage.