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ADC10 Poster: **Spatial Distribution of Urban Runoff Pollutant in the Southern California Region and Its Impacts on Environmental Justice Analysis: An Application of GIS Using EPA's PLOAD Model and SCAG Land Use Scenario Dataset**

The Southern California Association of Governments (SCAG) is in the process of crafting its 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for the Southern California region. In compliance with the Title VI of the Civil Rights Act of 1964 (Title VI), SCAG is mandated to perform environmental justice analyses on the low-income or minority populations regarding benefits and burdens of proposed projects in the region. Urban runoff pollutant analysis is one of the important areas that need to be investigated and measure its potential impacts on the environmental justice population. Non-point source (NPS) pollutants from urban runoff are hard to monitor and manage. It exerts significant impacts on watersheds in the Southern California region and has caused concerns from local jurisdictions about water quality and meeting regulatory requirements. Local jurisdictions do not have regulatory control over water; however, in California, they do have land use authority for local planning decisions.

In this paper, we utilize Environmental Protection Agency (EPA)'s Better Assessment Science Integrating point and Nonpoint Sources (BASIN) Pollutant Loading Estimator (PLOAD) model to calculate and spatially visualize urban runoff pollutant, total phosphorus, in relation to different urban growth scenarios and land use changes. After determining the urban runoff pollutant by different land use types, further analysis is conducted to measure the impacts of pollutant within disadvantaged communities in light of environmental justice analysis.

For NPS pollutant control, imperviousness as an indicator is widely used in local and regional environmental planning efforts. Different urban growth scenarios will most likely generate different impervious patterns and urban runoff, which ultimately leads to various extents of impacts on the watershed environment. California's SB 375 requires MPOs, like SCAG, to integrate the planning process for transportation, land use, and housing to reduce greenhouse gas (GHG) emissions from cars and light trucks. This paper applies ArcGIS applications (i.e. spatial analysis tools) and EPA's PLOAD to map out the NPS spatial distribution within SCAG region. In this project, we use the simple method approach of the PLOAD model to calculate pollutant loading; this particular method has several factors including runoff coefficient, precipitation, ratio of storms producing runoff, event mean concentration (EMC) for land use type, and area of land use type. Transportation analysis zones (TAZs) are used as geographic unit of analysis for the analysis of land use data.

By using GIS to demonstrate the spatial pattern changes of NPS pollutants under different land development scenarios provided from 2016 Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS) long-term land use strategies, local jurisdictions and stakeholders can link the built environment to sustainable water quality and watershed management in Southern California.