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# Terrestrial nutrient loads and fluxes to the Southern California Bight, USA

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### ABSTRACT

This study presents the first comprehensive regional estimates of terrestrial total nitrogen (TN) and total phosphorus (TP) loads and fluxes, from point sources (PS), non-point sources (NPS), and natural sources to the Southern California Bight (SCB), based on an extensive dataset collected across SCB watersheds in 2008-2009. The study estimated the net increase in anthropogenic nutrient inputs for 2008-2009 compared to loads prior to urbanization (c. 1850) by modeling the contribution of natural undeveloped land-use. Anthropogenic activities have increased terrestrial nutrient loads to the SCB by 47.32 Gg TN yr<sup>-1</sup> and 2.88 Gg TP yr<sup>-1</sup>, representing a 52-fold TN increase and a 30-fold TP increase from the pre-urbanization scenario. The average annual nutrient fluxes from SCB watersheds are amongst the highest fluxes observed in an urbanized coastal setting (3,157 kg TN km<sup>-2</sup> and 210 kg TP km<sup>-2</sup>). At a sub-regional scale, fluxes range from 15,988 kg TN km<sup>-2</sup> and 1,038 kg TP km<sup>-2</sup> in the highly urbanized and PS-dominated Santa Monica Bay to 44 kg TN km<sup>-2</sup> and 19 kg TP km<sup>-2</sup> in the relatively undeveloped Santa Barbara sub-region. Point sources contribute 92% of TN and 76% of TP loads to the SCB, with less than 1% of the loads attributed to the natural background sources. PS is a chronic source of nutrient loads to the SCB at a magnitude and timing atypical in Mediterranean ecosystems.

### Full Text

[http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13\\_245\\_258.pdf](http://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2013AnnualReport/ar13_245_258.pdf)