Low-cost sensor networks and land-use regression: Interpolating nitrogen dioxide concentration at high temporal and spatial resolution in Southern California

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ABSTRACT

The development of low-cost sensors and novel calibration algorithms offer new opportunities to supplement existing regulatory networks to measure air pollutants at a high spatial resolution and at hourly and sub-hourly timescales. We use a random forest model on data from a network of low-cost sensors to describe the effect of land use features on local-scale air quality, extend this model to describe the hourly-scale variation of air quality at high spatial resolution, and show that deviations from the model can be used to identify particular conditions and locations where air quality differs from the expected land-use effect. The conditions and locations under which deviations were detected conform to expectations based on general experience.

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