



Modelling Urban diffuse pollution in groundwater

Musa Jato (1,3), Martin Smith (1,2), Andrew Cundy (2,3)

(1) m.jato@brighton.ac.uk, University of Brighton, Brighton, United Kingdom, (2) martin.smith@brighton.ac.uk, University of Brighton, (3) A.cundy@noc.soton.ac.uk, National Oceanography Centre, Southampton.

Diffuse urban pollution of surface and ground waters is a growing concern in many cities and towns. Traffic-derived pollutants such as salts, heavy metals and polycyclic aromatic hydrocarbons (PAHs) may wash off road surfaces in soluble or particulate forms which later drain through soils and drainage systems into surface waters and groundwater. In Brighton, about 90% of drinking water supply comes from groundwater (derived from the Brighton Chalk block). In common with many groundwater sources the Chalk aquifer has been relatively extensively monitored and assessed for diffuse rural contaminants such as nitrate, but knowledge on the extent of contamination from road run-off is currently lacking. This project examines the transfer of traffic-derived contaminants from the road surface to the Chalk aquifer, via urban drainage systems. A transect of five boreholes have been sampled on a monthly basis and groundwater samples analysed to examine the concentrations of key, mainly road run-off derived, hydrocarbon and heavy metal contaminants in groundwater across the Brighton area. Trace concentrations of heavy metals and phenols have been observed in groundwater. Electrical conductivity changes in groundwater have also been used to assess local changes in ionic strength which may be associated with road-derived contaminants. This has been supplemented by systematic water and sediment sampling from urban gully pots, with further sampling planned from drainage and settlement ponds adjacent to major roads, to examine initial road to drainage system transport of major contaminants.