

OPTICAL BRIGHTENERS AS SURROGATES FOR HUMAN POLLUTION IN
URBAN STREAMS OF THE PASSAIC RIVER BASIN – FLUOROMETRIC
DETECTION IN THE FIELD AND LABORATORY

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Optical brighteners (OBs) or fluorescent whitening agents are a nearly ubiquitous component of fabric detergents and paper manufacturing. As such, their presence in urban water is an almost certain indication of pollution from human sources. Fluorometric determination of these compounds in water is an extremely sensitive technique capable of detection of these compounds at the pico-molar level. Portable field instruments allow for direct measurement of fluorescence on continuous or discrete-sampled water in the field; while, absorption techniques allow for long-term, integrative sampling.

Several approaches to the quantification of the presence of OBs in urban streams (Molly Ann and Preakness Brook, Passaic County, NJ) are being investigated. These include in-field measurement of fluorescence using a flow-through cell with a portable fluorometer and absorption onto suspended cotton pads followed by either direct measurement on the exposed cotton or indirect measurement on solvent-extracted cotton pads using a laboratory spectro-fluorometer.

Simultaneous measurement of other stream variables (including bacteriology) are compared to the fluorometric results. Measurements have been made over several months beginning in early Spring 2008 and will continue throughout the winter of 2008/2009.

KEYWORDS

Optical brighteners, urban streams, non-point source pollution, monitoring.