

## **Exposing water samples to ultraviolet light improves fluorometry for detecting human fecal contamination**

Peter G. Hartel<sup>1</sup>, Charles Hagedorn<sup>2</sup>, Jennifer L. McDonald<sup>3</sup>, Jared A. Fisher<sup>1</sup>, Michael A. Saluta<sup>2</sup>, Jerold W. Dickerson, Jr.<sup>2</sup>, Lisa C. Gentit<sup>3</sup>, Steven L. Smith<sup>3</sup>, Nehru S. Mantripragada<sup>1</sup>, Kerry J. Ritter and Carolyn N. Belcher<sup>4</sup>

<sup>1</sup>*University of Georgia, Department of Crop and Soil Sciences, Athens, GA*

<sup>2</sup>*Virginia Polytechnic Institute and State University, Department of Crop and Soil Sciences, Blacksburg, VA*

<sup>3</sup>*University of Georgia, Marine Extension Service, Brunswick, GA*

<sup>4</sup>*Georgia Department of Natural Resources, Brunswick, GA*

### **ABSTRACT**

Fluorometry identifies human fecal contamination by detecting optical brighteners in environmental waters. Because optical brighteners are sensitive to sunlight, we determined if we could improve fluorometry by exposing water samples to ultraviolet (UV) light to differentiate between optical brighteners and other fluorescing organic compounds. Optical brighteners were likely present when the relative percentage difference in fluorometric value of the water before and after UV light exposure was >30% (glass cuvettes, 30 minute exposure) or >15% (polymethacrylate cuvettes, 5 minute exposure). In a blind study, we correctly identified the presence or absence of optical brighteners in 178 of 180 (99%) of the samples tested with a more expensive field fluorometer and in 175 of 180 (97%) of the samples tested with a less expensive handheld fluorometer. In the field, the method correctly identified two negative and three positive locations for human fecal contamination. When combined with counts of fecal bacteria, the new fluorometric method may be a simple, quick, and easy way to identify human fecal contamination in environmental waters.

### **Full Text**

[ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07\\_281\\_298.pdf](ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/AnnualReports/2007AnnualReport/AR07_281_298.pdf)