613 Coupling online effects-based monitoring with physicochemical, optical, and spectroscopy methods to assess quality at a surface water intake. J. Allen, M. Elovitz, U.S. EPA / Office of Research and Development; C.T. Nietch, US EPA / Water Supply Water Resources Division; J.M. Lazorchak, US EPA / Office of Research and Development. Effects-based monitoring of water quality is a proven approach to monitoring the status of a water source. Only biological material can integrate factors which dictate toxicity. Online Toxicity Monitors (OTMs) provide a means to digitize sentinel organism responses to dynamic water quality with subsequent input into a water quality management decision structure. These systems assess the toxicity of water samples by monitoring responses of living organisms in a continuous, time-relevant manner. As part of a larger watershed research effort within the East Fork of the Little Miami River Watershed, an effort is underway to deploy a suite of water quality monitors at the drinking water intake structure located on Lake Harsha, a reservoir located in Clermont County, OH during the 2013 season. Historically, harmful algal blooms (HABs) have been observed in Lake Harsha and, along with contaminants associated with mixed agriculture and suburban land uses, represent a significant challenge to the cost-effective production of safe drinking water. The goal of this monitoring effort is to provide time-relevant feedback to the drinking water producer and watershed water quality managers regarding potential HABs and episodic contamination events. The approach described here couples OTMs with basic physical/chemical, optical, and spectroscopy methods to provide a relatively comprehensive water quality data set applicable to both ecological and source water process managment. The selected suite includes three OTMs (*Daphnia magna* behavior, *Aliivibrio fischeri* luminescence, and algal PAM fluorescence), an optical particle analysis system, a multiparameter sonde, a UV-vis absorbance spectrophotometer, and total organic carbon analyzer. All data streams will be telemetered to a central database. Real-time analysis of the streaming data will be developed. Details of this approach and experience gained through the process will be presented.