

Maryland-Delaware-District of Columbia
Water Science Center
Seminar Series

Thursday, January 30, 2014 11:00-12:00

New Technologies for Identifying Discharging Groundwater into Streams

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Discharging groundwater can greatly influence the quantity and quality of surface-water. Many previous investigations have shown surface-water quality can be degraded by the discharge of groundwaters with dissolved nitrate and organic solvents from contaminated aquifers. However, discharge zones of groundwater into surface-water bodies can be difficult to detect at appropriate spatial scales.

The objective of this presentation is to highlight technologies that can be applied to identify areas of groundwater discharge into streams, using both physical and chemical measurements.

During winter months, contrasting temperatures between the relatively warmer groundwater and cooler surface water can often differentiate between the two sources. The opposite phenomenon occurs in the summertime, making both seasons potentially good times to identify seeps. Measuring water temperature over a variety of spatial scales can be achieved with hand-held- boat- and airplane-mounted devices. Hand-held Forward Looking Infrared (FLIR) cameras provide detailed water-temperature information for smaller areas, such as stream banks.

For broader reconnaissance efforts, radio-controlled boats and aircraft are well suited to identify seep areas, based on differences in water temperatures. The U.S. Geological Survey (USGS) has developed instruments capable of taking a variety of water-quality parameters, including temperature, which can be measured real-time and also spatially referenced with an on-board GPS unit. By delineating the seeps, characterization and remediation efforts can be focused in the areas that contribute the greatest amount of contamination.

Presentation also available remotely via Webex: <https://usgs.webex.com/>

For directions to the USGS MD-DE-DC WSC: <http://md.water.usgs.gov/directions/baltimore.html>.