Project Title: Evaluation of watershed-scale impacts of stormwater management facilities on thermal loads to a Maryland Class IV stream using a high-frequency sensor network

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Brief project description:

This project will deploy a high-density, high-frequency network of Bluetooth-enabled temperature sensors throughout 16 km of a Use Class IV stream (Dead Run) in suburban Baltimore to address the following question: *What best management practice (BMP) design and siting methods will reduce thermal impacts to streams in Maryland's Use III and IV watersheds?* At the watershed scale, high-frequency (5-minute) temperature data will be collected from sensors secured to the streambed every 100 m, over all flow regimes (base flow to storm flow), for at least four seasons. Based on watershed-scale observations, stream temperature data will be collected downstream of ~30 BMP outfalls (spanning at least four BMP types) at a finer spatial scale (2 m - 50 m), and a higher frequency (1 minute). This data set will be used to quantify thermal inputs to the stream system from (1) surface and subsurface stormwater management facilities; (2) direct connections to land cover including impervious surface area during runoff events; and (3) effects air temperature and tree canopy on stream temperature throughout the drainage network. This work will advance scientific knowledge by separating impacts from stormwater BMPs vs. other environmental factors on stream temperature at the watershed scale; the results will be used to inform regulatory policy for setting Total Maximum Daily Loads (TMDLs) for stream temperature.