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# TEMPORAL VARIATION IN PHYSICAL AND CHEMICAL PARAMETERS IN STREAMS DRAINING COMMERCIAL, RESIDENTIAL, AND RURAL WATERSHEDS, ENOREE RIVER BASIN, SOUTH CAROLINA

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Periodic grab samples from a stream often are used to infer stream function and watershed biogeochemistry. We examined short-term temporal variability in temperature and chemical parameters to determine whether weekly grab sampling from headwater streams provides accurate estimates of these parameters under baseflow conditions. We also examined temporal variability associated with a modest storm event.

Our studies were conducted at three localities in streams within the Enoree River basin in northwestern South Carolina during July 2006. Two streams drained urbanized sub-watersheds with either commercial and/or residential land cover. The third stream drained a rural sub-watershed that included a mixture of forest, pasture, and residences. A pressure transducer was installed at each of the streams to record stage height continuously. A YSI sonde was placed into each stream for periods of up to three days to measure temperature, conductivity, pH, and dissolved oxygen (DO) concentrations continuously. Additionally, an ISCO automated water sampler was used to collect samples at one to three-hour intervals from each stream over periods of one to three days. One set of samples was collected during a storm event in a commercial sub-watershed.

We found that temperature, conductivity, pH, and DO concentrations varied diurnally, albeit by modest amounts (ranges of about 4 $^{o}$C, 5 uS/cm, 0.5 pH units, and 3 mg/L, respectively). We hypothesize that these diurnal changes were due in part to algal photosynthesis and respiration within the stream. Solute concentrations generally showed little hourly to daily variation during baseflow conditions. The ranges of concentrations for most solutes were < 10% of the mean concentrations. However, for dissolved organic carbon (DOC) and total dissolved nitrogen (TDN), the ranges were > 20% of the mean concentrations. Sulfate concentrations doubled during the storm event at the commericial site, but nitrate and chloride concentrations showed little change.

Based on our results, we suggest that a single in situ analysis and grab sample provides a reasonably accurate representation of the chemical composition of streams in the piedmont region of South Carolina under baseflow conditions. However, concentrations of some solutes may change appreciably during storm events.

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