

MEGAN BEHRMANN#, and JACQUELYN COLE, Department of Chemistry, Shepherd University, Shepherdstown, WV, 25443. **Testing of local water samples for caffeine, theobromine, and theophylline: Potential aquatic pollutants.**

The average American consumes 300mg of caffeine a day, and only about 70% is metabolized into Theophylline and Theobromine. The other 30% is excreted primarily through urine, where it goes to water treatment plants and then into the environment. Previous studies have shown that most water treatment plants are capable of removing 90-95% of the caffeine during treatment, but the remainder enters the environment without being broken down. Caffeine is the one of the most widely consumed and least-regulated drugs. Due to the molecule's integrity, it has potential to build up in water systems over time. Even microgram per liter amounts have been shown to cause significant effects in small aquatic invertebrates and shellfish, and may ultimately affect the ecosystem as a whole. In addition to the environmental affects, if caffeine is present in drinking water, it could have significant impact for those with heart conditions and those with sensitivity to caffeine. In this study, samples were collected from local streams and rivers as well as city and well water taps. They were analyzed using LC/MS/MS to quantify the caffeine, theobromine, and theophylline content using a deuterated internal standard, and a comparative study was performed. The observed concentrations were also compared to previous studies of caffeine testing in other water sources. While only small amounts are being detected at present, there is concern for the future of our caffeinated society.