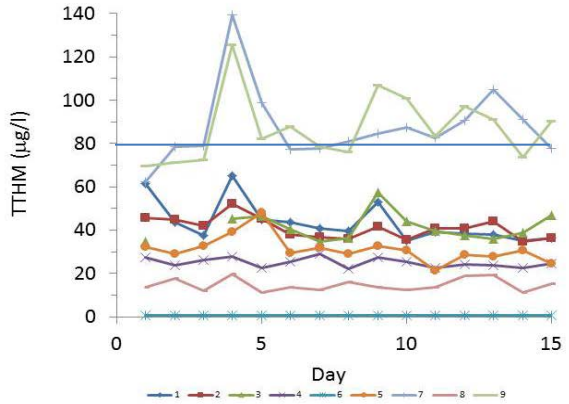
Drinking Water Disinfection By-Product Exposure Assessment and Validation for the National Children's Study. Binkley T[1], Malecki K[2], Specker B[1], Durkin M[2]
[1] South Dakota State University Study Center, [2] University of Wisconsin-Madison Study Center

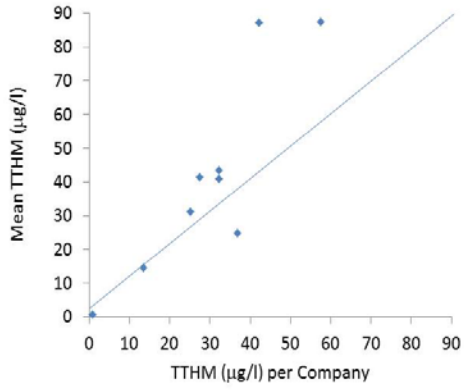
Trihalomethanes are water disinfection by-products resulting from the reaction of chlorine and/or bromine with organic matter. Total trihalomethanes (TTHM) include chloroform, bromoform, bromodichloromethane and dibromochloromethane. For households on community water, linkage with existing community water supply monitoring programs may serve as a ready source of population exposure data. However, this source may be insufficient for capturing peak exposure levels during critical windows of fetal and child growth and development. The goals of this study were to determine day-to-day variability in TTHM concentrations from household samples of surface or shallow well community water during peak run-off season, and to determine how mean TTHM concentrations compare with existing community water supply monitoring program data. Daily water samples were collected over 15-days in the fall of 2010 from 9 households served by 4 water companies. South Dakota Department of Health tested for TTHMs using EPA protocols and water companies were contacted to obtain reported TTHM concentrations around the same time. The overall median TTHM concentration was 36 μg/l, with mean concentrations ranging from 0.7 to 88 μg/l across households. Day-to-day variability within a household over the 15 days ranged from 8% to 22% and there were significant differences among water company values ($p<0.001$). Mean TTHM concentrations in household water samples during peak run-off were greater than concentrations reported by the water companies, and 6 of 9 households had mean TTHM concentrations higher than their respective water company values, confirming the importance of individual household-level monitoring of TTHM exposure.

TTHM Concentrations
Eastern South Dakota & Western Minnesota



Households 7 & 9 and 1 & 2 were supplied by the same water company, but different locations.

Comparison between Mean and Reported TTHM Concentrations



Mean TTHMs were calculated from 9 households collected over 15 days from 7 different water companies in eastern South

/