MATH 480
Senior Seminar
Spring 2009

**Date:** April 15th, 2009

**Speaker:** Lauren Hodges, UNC Asheville

**Title:** *Pattern analysis of French Broad hydrographs using wavelet transforms*

**Abstract:** In surface water hydrology, a hydrograph is a graphical representation of stream discharge over time. Historic hydrographs can be analyzed with wavelet transforms to detect temporal patterns in discharge level, or combined with precipitation data to determine the effect of urbanization on stream flow. Although Fourier transform methods have dominated hydrologic pattern analysis over the years, wavelet transforms have recently become popular due to their ability to detect patterns over multiple time scales.

This talk will discuss how wavelet transforms can be used to analyze a real-life data set. The United States Geologic Service (USGS) installed North Carolinas first stream gage in the French Broad River, and it has collected daily discharge levels since 1895. The National Climatic Data Center (NCDC) has recorded daily precipitation levels in Asheville since 1905. We will use wavelet transform methods to determine if there is a correlation between precipitation levels and discharge rate in the French Broad.