

Public Abstract

First Name:Sean

Middle Name:Johann

Last Name:Zeiger

Adviser's First Name:Jason

Adviser's Last Name:Hubbart

Co-Adviser's First Name:

Co-Adviser's Last Name:

Graduation Term:SS 2014

Department:Forestry

Degree:MS

Title:MEASURING AND MODELING STREAM AND AIR TEMPERATURE RELATIONSHIPS IN A MULTI-LAND USE WATERSHED OF THE CENTRAL UNITED STATES

A nested-scale experimental watershed study design approach was used in an urban watershed of the central U.S. to investigate water quality, specifically stream water temperature (T_w) in Hinkson Creek, during water year's 2011, 2012, and 2013. Drought conditions were observed during water year 2012 when total annual precipitation was approximately 340 mm less than the 30 year record. Sudden increases in T_w of >1 °C within a 15 minute time interval (T_w surges) following summer thunderstorms were observed at urban sites in Hinkson Creek. T_w surges degrade stream habitat. Differences in mean T_w between gauging sites were related to urban land use and downstream distance as discharge increased. The relationship between T_w and air temperature (T_a) data was critically examined. Additionally, tools land managers use to predict T_w (T_w models) were created and evaluated. The Soil and Water Assessment Tool (SWAT), and a new processed based T_w model were tested. Results showed the T_w model used in SWAT and the new processed based T_w model accurately predicted daily average T_w in Hinkson Creek. Results from this study will provide land managers with information and T_w models needed to make informed management decisions and improve water quality in urban watersheds.