

Southeastern Section - 58th Annual Meeting (12-13 March 2009)

**Paper No. 16-29**

**Presentation Time:** 8:30 AM-12:30 PM

## **THE IMPACT OF GOLF COURSES ON STREAM WATER TEMPERATURE IN THE UPPER PIEDMONT, GREENVILLE, SOUTH CAROLINA**

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Golf courses are an increasingly prominent feature across the southern U.S. landscape. Most courses contain streams that pass through the course grounds. The impact that these courses have on a stream's aquatic ecosystem is an area of active research. Previous work has focused on the impacts of course runoff and potential non-point source pollution on stream chemistry, but significantly less work has been done on the impacts to physical characteristics like stream water temperature.

In this study a comparative analysis of stream water temperature was conducted at six different golf courses in Greenville, South Carolina. Courses were selected that had continuous, tributary free and lake free reaches that passed through the golf course grounds. At each course, stream water temperature was measured at 5 minute intervals from June – November 2008 at a site upstream and downstream of the course. An Onset Water Temp Pro V2 temperature logger secured to the stream bottom was used to measure water temperature. In addition to stream temperature, a number of other parameters were assessed along the golf course stream reach including stream discharge measurements under baseflow conditions, stream length between sampling sites, the extent of riparian cover along the stream banks, and any human alterations to the stream's channel morphology.

Under baseflow conditions during the period of record, the sites downstream of the courses exhibited (1) consistently higher stream water temperatures (on the order of 4 – 10 °F during the afternoon hours) and (2) significantly larger diurnal temperature ranges (typically two to three times larger) compared to their upstream counterparts. The observed temperature differences between the up and downstream sites were primarily due to the lack of riparian cover along the golf course reaches and to a lesser extent alterations in the stream channel morphology. Temperature differences among the sites were governed by differences in stream discharge and stream length in addition to the extent of riparian cover and channel alteration. Although the impacts of these temperature modifications on the ecology, biology, and chemistry of the stream system are not known, the magnitude of the temperature change is large enough to be of potential consequence.

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[General Information for this Meeting](#)

Session No. 16--Booth# 29

[Undergraduate Research \(Posters\)](#)

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