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Quantifying Natural Resources Using Field-Based Instruction and Hands-On Applications

Daniel Unger, I-Kuai Hung, David Kulhavy, and Yanli Zhang

Undergraduate students pursuing a Bachelor of Science in Forestry (BSF) degree at Stephen F. Austin State University (SFA) attend an intensive 6-week residential hands-on instruction in applied field methods. For students pursuing the BSF degree knowing the exact location, length, or area of a forestland is crucial to the understanding and proper management of any related natural resource. The intensive 6-week instruction includes teaching how to use the Global Positioning System (GPS) to accurately record the true spatial location of an earth's surface feature. After receiving hands-on instructions, students are taken to the field to collect real-world locations and area measurements. Upon returning from the field students are instructed how to assess the accuracy of their GPS collected waypoints by deriving the Root Mean Square Error (RMSE) comparing their GPS collected locations, derived perimeter and area assessments with the actual location, length and area respectively. Overall objective was to assess the effectiveness of GPS hands-on instruction methodology within a field-based setting. Since accurate quantitative data are crucial in any natural resource management plan, a student being able to accurately assess the real-world location and derived GPS perimeter and area measurements is essential. One hundred percent of students, when working in a group setting, scored ≥ 80 percent on a group participation lab. Ninety-three percent of students scored ≥ 80 percent when tested individually on a hands-on GPS exam. The high lab and exam scores of students attending field station in the summer of 2013 validate the teaching effectiveness of ATCOFA faculty in quantifying natural resources using field-based instruction and hands-on applications.

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