

Evaluation of a CORS for Use by Alabama Producers

PROJECT REPORT

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Principal Investigators

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Introduction

Data provided by a Continuously Operating Reference Station (CORS) can be used for Real-Time Kinematic (RTK) applications in agriculture. The main use for CORS in agriculture has been to replace traditional base station use by producers for RTK level guidance systems. Agriculture equipment outfitted with an internet accessible cellular phone or modem (with internet data package) and RTK-level GPS equipment can utilize the around-the-clock data output for their GPS correction signal (Figure 1). A CORS provides extended signal range (with no line-of-sight required; only cellular coverage), accessibility by a wide range of users, and reduced investment costs for RTK-level technology (i.e. auto-steer systems). Therefore, the objective of this study was to evaluate the accuracy of autoguidance systems utilizing CORS as their correction service.



Figure 1. Tractor equipped with RTK GPS receiver and internet accessible cellular phone which receives real-time GPS correction signal from a CORS site in

Courtland CORS Project

In March 2008, ACES facilitated a partnership between Lawrence County, Alabama farmers, the Alabama Department of Transportation, the Lawrence County Board of Education and Alabama commodity groups (Alabama Cotton Commission and Alabama Wheat and Feed Grain Committee) for installation of the first CORS site designated for agriculture (Figure 2). While the site remains accessible to the public, the primary users have been Alabama producers, making it the first of its kind in the nation.

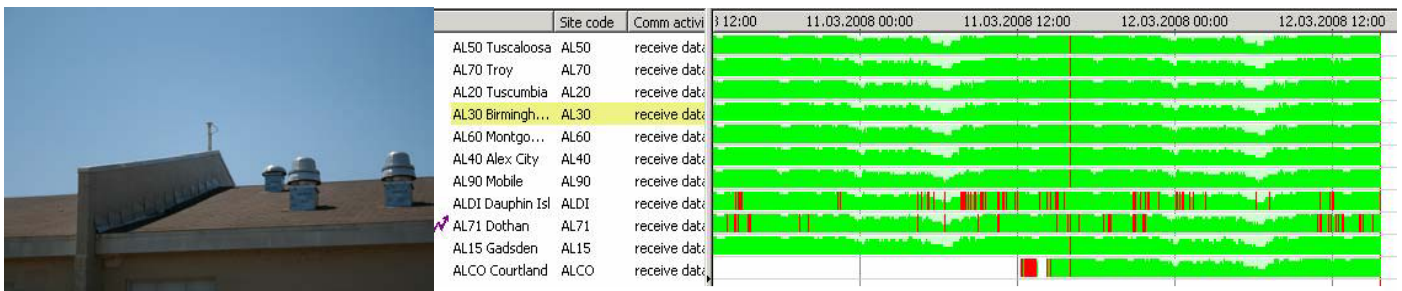


Figure 2. CORS GPS receiver mounted on top of a building in Courtland, AL (left) and streaming data output from Courtland station (right).

Results and Planned Efforts

Preliminary data collected on the Auburn Campus suggests that 2 to 4 in. horizontal accuracy can be maintained up around 25 miles from the base station. However, a more thorough investigation is planned during 2009 with compatible autoguidance systems setup to use CORS. RTK auto-steer systems at the Tennessee Valley (Belle Mina, AL) and Gulf Coast (Fairhope) Research and Extension Center were upgraded in 2008 to make them compatible for use with CORS. Each tractor was upgraded to a Trimble Field Manager Display, RTK GNSS AgGPS 442 Receiver with NavII Controller and 900 MHz radio. The appropriate modems and data packages installation is planned for February 2009 with testing to commence shortly thereafter. Research will focus on evaluating the position accuracy, repeatability and applications of CORS for agriculture during 2009 at both Research and Extension Centers. The dynamic assessment will determine horizontal and vertical position accuracy as a function of distance from the CORS site; accuracy of CORS as compared to a traditional base station; and repeatability of CORS data as compared to RTK base stations.