

Public Abstract

First Name: Joshua

Middle Name: Gregg

Last Name: Swanson

Adviser's First Name: C. Mark

Adviser's Last Name: Cowell

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Title: A TEST OF DIFFERENTIAL GPS CORRECTION METHODS AT FORT HUACHUCA, ARIZONA

High accuracy GPS using inexpensive field equipment is increasingly made possible through use of reference data provided by the Continuously Operating Reference Station (CORS) network. There are currently three CORS within 100km of Fort Huachuca, Arizona, but use of CORS data in differential correction has previously proven unreliable. The effectiveness of base data acquired through use of a second field unit as an on-site base station was compared with the use of CORS. The accuracy of data differentially corrected using base data acquired from an on-site base station showed marked improvement over the use of CORS base data. Accuracy of locally corrected points improved by 75cm and 95cm in two study areas as compared to uncorrected data, while accuracy actually degraded by 28cm and 1cm in these areas when differentially correcting using the nearest CORS. Sub-meter accuracy was attained in over 90% of local base corrected Differential GPS (DGPS) points.

This project explores differences in horizons at rover and base as one possible explanation for the limited utility of CORS base data at Fort Huachuca. The 'Sky Islands' of southeastern Arizona present widely varying terrain conditions over relatively short distances, and blockage of the sky due to horizon differences is one variable condition at the collection sites. Upon testing, however, variability in horizon did not prove to be the primary cause of limited utility of DGPS using CORS at Fort Huachuca. Thus, site conditions limiting the utility of CORS in the Sky Islands, and perhaps other areas, remain to be identified.