A Comparison of GPS Receiver Accuracy

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Objective – To determine the accuracy of four commercially available GPS units and the potential value of real-time differential correction.

Unit and Approximate Cost –

- Eagle Explorer - $200
- Lowrance Global Nav12 - $300
- Trimble GeoExplorer II - $3000
- Trimble Pro XR – $10,000 (*The only unit with real-time differential correction capabilities)

Methods –

- Four United States Army Corps of Engineers surveyed boundary monuments were used as control points.
- Positions were collected over a period of three months using each unit.
- ArcView 3.1 was used for statistical analysis.

Unit Variation using Uncorrected Data

UNIT	**Location One -**20% canopy cover	**Location Two** -40% canopy cover	**Location Three -**80% canopy cover	**Location Four** - open field	**Cumulative**	**Range of Accuracy**
Eagle Explorer	64 m	66 m	68 m	39 m	59 m	13.6 – 178.5m
Lowrance GlobalNav12	132 m	28 m	94 m	21 m	69 m	12 8.2 – 551.0m
Trimble GeoExplorer	20 m	29 m	67 m	69 m	46 m	10.1 – 165.1m
Trimble Pro XR	0.9 m	4 m	1.1 m	0.76 m	1.8 m	0.27 – 18.2m

Unit Variation using Post Processed Data

UNIT	**Location One -**20% canopy cover	**Location Two** -40% canopy cover	**Location Three -**80% canopy cover	**Location Four** - open field	**Cumulative**	**Range of Accuracy**
Trimble GeoExplorer	4.5 m	3.5 m	4.4 m	1.6 m	3.5 m	0.21 – 13.25m
Trimble Pro XR	0.8 m	0.7 m	1.1 m	0.5 m	0.8 m	0.10 – 2.02m

Conclusion

- Units lacking real-time differential correction capabilities generally lacked consistency.
- Real-time differential correction capabilities allow a high degree of accuracy while in the field.