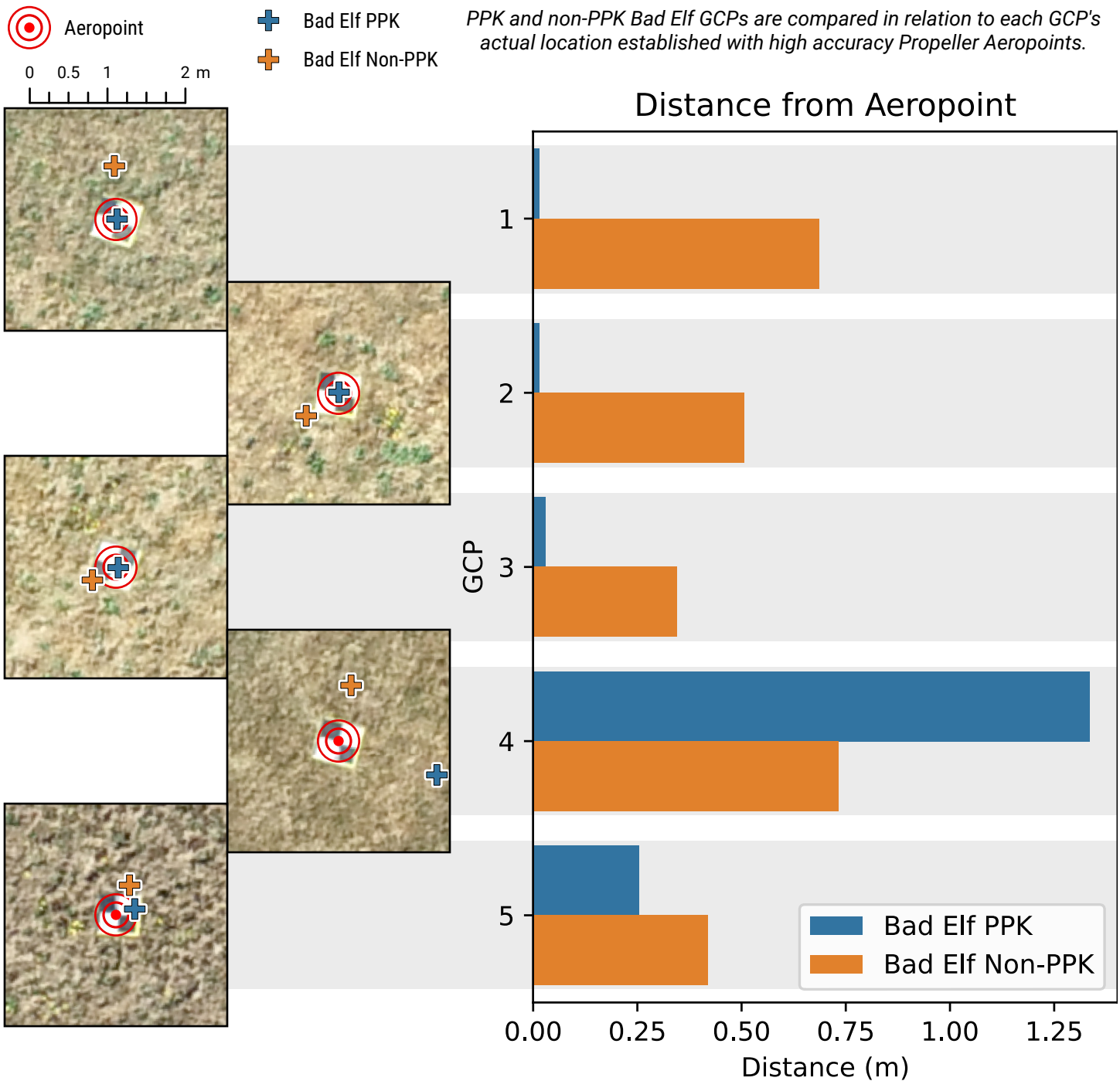


Improving GCP Accuracy Through PPK



Although the Bad Elf (BE) Surveyor is accurate to about 1m at most, using careful GCP collection, Post Processing Kinematics (PPK), and point clustering, we can achieve accuracies close to a much more expensive RTK receiver like in the Propeller Aeropoint. On site, one must allow the BE to get a solid fix and collect a cluster of many points over about 15-20 minutes per GCP. Then, the raw GNSS observation data can be combined and corrected with observation data from a nearby CORS station, using the RTKLib software. This is the PPK step. This corrected BE point data is then imported into ArcGIS Pro where we can

identify clusters of points collected at each GCP using the DBSCAN algorithm of the Density-Based Clustering tool. DBSCAN automatically groups points that are within a minimum distance from each other, which is perfect for the high-density tightly-spaced points the BE collects over GCPs. Then, the mean location for each cluster is found with Mean Center, using the cluster id as the group "case field." These cluster means are the PPK BE GCPs. We export these GCPs to a csv file, and use them in photogrammetry software such as Metashape or Open Drone Map to georeference the process outputs.