

RPAS-based data collection techniques for coastal restoration monitoring: Advancements, challenges and lessons learned.

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Remotely Piloted Aircraft System (RPAS) technologies have seen significant advancements in capabilities and consumer accessibility in recent years. Digital Surface Models (DSMs) and orthomosaics produced from RPAS data using photogrammetric techniques can be utilized in coastal restoration projects to improve or replace traditional methods of data collection and environmental monitoring. This presentation will discuss the capabilities and limitations of RPAS in challenging coastal environments, with lessons learned from multiple managed realignment and tidal wetland restoration projects in Nova Scotia, Canada. Multi-temporal data collection with a DJI Phantom 4 RTK aircraft showed that the integration of survey-grade positioning to RPAS may increase data accuracy, allowing for hyper-resolution measurements of surface elevation change at the site scale and mapping of embryonic channels in developing drainage networks. RPAS technologies greatly increase our ability to research site evolution, by allowing the measurement of difficult to access areas, site-level data collection in minimal time, and hyperspatial data products. However, care must be taken when using photogrammetric techniques to measure homogenous surfaces such as wet mud, and when calculating sedimentation and volumetric change rates that may be affected by below-ground processes and surface offsets.