**SAGEEP 2025**

**Special Session on the Future of Geophysics**

Presentation title: **Drone Geoscience**

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Drones applied to the mapping of the earth whether through to acquire remote sensing data or geophysical is an accepted practice all over the globe. During the past 10 years, the utilization of off- the-shelf unmanned aerial vehicles (UAV) fitted with a magnetometer can be described as “phenomenal”, with the primary application being the exploration for extractable resources followed closely, in the US at least, by the need to locate orphaned oil and gas wells. Adding to the options of geophysical data collectable via a remotely piloted small aircraft are a variety of emerging EM instruments including GPR. A few companies and research institutions are developing the capability to collect seismic and gravity data using a drone. In short, the future will be one where autonomous mapping of the earth using airborne robots will become the rule rather than a novel concept. I propose the term “Drone Geoscience” be used to refer to this emerging subdiscipline of earth study based on the joint collection of geophysical and remote sensing data.

While the advantages of using small UAV are clear, there are limitations that sometimes are overlooked or not well understood. Some working in the sector might point to the regulations controlling the air space. Others might point to the politically motivated restrictions currently creating havoc. I will briefly summarize these issues before moving forward to describe the advances in technology pertaining to drones during the last ten (10) years in sensors and aircraft. I believe a review of where we started leading to the technology that is available today will informs us, the consumers of drone geoscience data about what to expect in the autonomous mapping technology vis a small Unoccupied Aerial System (sUAS) by 2028, three (3) years in the future. If you are not using geoscience data collected via a sUAS at this time, you will be.

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