

PERSPECTIVE FROM THE FIELD

Environmental Data Collection and Unmanned Aircraft Systems

Patrick Egan

The promise of unmanned systems has always been low-cost self-guided data collection. This includes many instances where data collection would either be cost prohibitive for equitable study, or in situations proving too dangerous or hostile to humans, such as studies in proximity to active volcanos.

As technology and electronics evolve we see new developments bringing a range of diverse and affordable sensors to market. These sensors allow us to see our environs in new and breathtaking ways without risking life and limb or millions of dollars. We now have the option to put lower weight and lower cost sensors in places that heretofore would have been impossible even with manned aircraft. The sky is truly the limit for unmanned systems technology, as it can augment any study, be it of land, air, sea, or space.

Software development is showing great promise in analyzing all of this new data. Copious amounts of data are being collected, and it is my estimation that “BIG” data will make the leap from words to pictures in the not-too-distant future. Visual representations of problems and solutions will be the only way to digest these massive amounts of data. Further, we will need to develop workflows that will allow us to disseminate actionable data in an efficacious time frame.

As an end user, your potential is almost unlimited; you know best what data is most relevant to your needs, then add to that the almost on-demand acquisition and availability of relevant data, and you can see why the world is excited about unmanned remote sensing.

The biggest impediment to the full realization of benefits is onerous regulation. It restricts everything from flight itself to data management on the other end. It generally stifles development by making business development more difficult. We must consider the regulation in the value proposition. Limited visual line of sight (VLOS) envelopes (the unmanned

aircraft must stay within the pilot’s unaided vision at all times) limit efficiency and thus the return on investment.

If we look to the European model, we see a more scientific system of risk-based and incremental integration. Currently, there are 2000 plus Civil Aviation Authority (CAA) certificated operators in 29 countries legally using unmanned aircraft systems for a myriad of different data collection applications. Their businesses have been allowed to develop and grow because of an environment of progressive regulation.

Companies see consolidation of data collection on land, in the sea, as well as in the air. They are looking to merge capabilities and find people that have remote sensing experience; they see business growth in some cases as high as 1000%. Who doesn’t want that?

The US picture is less rosy, as most in the unmanned aircraft community are only starting to realize that what they are getting themselves into is aviation. By current definition, almost anything that flies and is used in the line of work or research is considered by the Federal Aviation Administration (FAA) to be an aircraft. Since when, you ask? Since both the passage of the FAA Reauthorization bill, and more recently, the November, 2014 National Transportation Safety Board (NTSB) ruling that model or hobby aircraft are aircraft and fall under the purview of the FAA.

There are efforts currently underway to try and provide the FAA with a better understanding of how the systems are currently employed, as well as some future considerations and applications. I say considerations, as I do not believe we will realize the full potential until we have science-based regulation. The science part remains to be seen, but we are guardedly optimistic.

Environmental practitioners are an end-user group with specific applications for data collection. Unfortunately, the potential for data collection is being limited by arbitrary

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legislation. For example, certain areas like national parks, airports, and some urban areas will be off limits. With more responsive and active legislation, we could open the door to new and innovative ways to collect data.

A notice of proposed rulemaking has been released, and we as a community are encouraged by what the FAA is

proposing. There are many rules on the books for aircraft known as Federal Air Regulations (FARs). If the rule comes out and looks like the proposal, many of those FARs may not apply for operations in the US National Airspace System, or as it is commonly referred to, NAS. This would allow environmental practitioners to maximize the potential of self-guided data collection.