

# LETTER FROM THE EDITORIAL OFFICE

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Drones: They're everywhere! Actually, the preferred name for drones is Unmanned Aircraft Systems (UASs). Most notoriously, UASs have played a significant role in our military operations in the Middle East, particularly on the front lines of the battle with ISIS and al Qaeda forces. The use of UASs to collect various forms of remotely sensed information and data has increased dramatically in recent years, giving rise to a serious ethical debate concerning potential breaches of personal privacy and potential nefarious uses of this technology.

In January 2015, a quadcopter landed on the White House lawn at 3:00 am, prompting the Secret Service to close down several blocks surrounding White House as they searched for the 'copter's owner. The owner eventually called the Secret Service to inform them that he had been flying the 'copter in a rather inebriated state and had lost sight of it! More recently, pop singer Enrique Iglesias was bashed by a UAS during one of his concerts, badly injuring his fingers. The irony here is that he employs UASs during his concerts to capture video of his fans, and he sometimes purposely snags a passing UAS to take a selfie! I guess he missed this time! The Dallas Cowboys football team has announced that it will use UASs to take video of their practices so their coaches can design better offensive and defensive plays. Given their recent track record with Spygate and Deflategate, I suspect the New England Patriots will be next in line to order a fleet of UASs. Some of my high school friends who have been longtime aficionados of remote-controlled planes are now flying UASs for fun, though I have never asked them what exactly "fun" entails.

All kidding aside, UASs are not some passing fad, they are here to stay. UAS technologies have made dramatic technological advances

in the past decade. Their use domestically is currently tightly constrained by existing Federal Aviation Administration (FAA) regulations. Within the next few years, the FAA is expected to provide a regulatory framework that allows for a greatly expanded role for UASs in domestic airspace, for a wide variety of applications. One of those applications will be remote sensing for land and natural resource monitoring. From hazardous waste site characterization to assessing and monitoring public land resource quality, UASs can be expected to revolutionize the quantity and quality of data sets available to decision makers and environmental scientists while significantly reducing the cost of acquiring such data sets. Indeed, at DePaul University (where I teach), the Department of Geography is now incorporating quadcopters outfitted with digital video cameras into their advanced remote sensing courses. It is my hope that the next generation of entry-level environmental scientists will be thoroughly trained on the uses of UASs for various forms of environmental data collection and surveying. I view the significance of UAS technology in environmental science applications in much the same way I viewed the rise of global positioning system (GPS) and geographical information system (GIS) technology 20 years ago. These technologies are now de rigueur in the environmental consulting world.

The September 2015 issue of *Environmental Practice (ENP)* is devoted to the application of UAS technologies for land and natural resource management. Several of the pieces in this issue were written by the participants of "Applications of Drone Technologies to Land and Natural Resource Management," a workshop held at Argonne National Laboratory in July 2014. We would like to thank the workshop organizer, Konnie Westcott, and everyone at Argonne National Laboratory for bringing these pieces to our attention.

In their research article, **Hearst and Cherkauer** present a methodological

approach for extracting small spatial plots from geo-registered UAS imagery of crop fields. Experimental crop fields often contain large numbers of small spatial plots that require separate analysis. It can be difficult to precisely locate these plots in high-resolution imagery of the fields gathered by UAS. This prevents UAS imagery from being applied in High-Throughput Precision Phenotyping and other areas of agricultural research. If the imagery is accurately geo-registered, then it may be possible to extract plots from the imagery based on their map coordinates.

We received three submissions in our *Environmental Reviews and Case Studies* category. **Detweiler et al.** present a case study describing the use of micro-UASs that fly in immediate proximity to the environment, enabling them to collect physical samples and capture sensor data that cannot be obtained at a distance. Their first study presents an aerial water sampler that flies to remote locations and dips a pump into the water to collect samples for laboratory analysis. Their second investigation involves using a micro-UAS to fly within a meter of crops to accurately measure their height. Each application required different sensors and methods specifically tailored to operating and interacting near the environment. The authors evaluate the performance of these systems and present preliminary validation that this technology collects data that are compatible with those gathered by existing approaches. The authors conclude that, despite numerous pending challenges, UASs that directly interact with the environment will transform the way environmental data is collected.

**Dulava, Bean, and Richmond** found that UAS technology provides efficient and repeatable methods for surveying wildlife, especially waterbirds. They examined the relationship between flight altitude and camera focal length on bird identification,

then conducted a post-hoc analysis to examine the effect of flight altitude on bird flushing behavior. They concluded that a minimum pixel resolution of approximately 5 mm was needed to identify most waterbird species. Their results suggest that using gas-powered UASs flown at low altitudes may result in increased rates of flushing for some waterbirds. The authors also report that UASs show promise for censusing and monitoring waterbirds, with careful surveying and processing workflow design.

In a departure from the use of UAS technology in environmental monitoring, **Khakzad and Elfimov** present a case study on environmental impacts during and after the flushing of the Dez Dam Reservoir in southern Iran. Their study investigated potential upstream sources of pollution, sediment concentration, water-quality parameters, and downstream water uses, with respect to impacts on fish and macroinvertebrate diversity. The results of this study will aid in determining the appropriate hydraulic conditions to decrease the negative environmental impacts of dam flushing on downstream aquatic conditions.

We received two *Perspectives from the Field* submissions. **Christopher Lippitt** discusses a paradigm shift taking place in the field of remote sensing through the use of small unmanned platforms, while **Patrick Egan** presents his perspective on the use of UAS for environmental data collection.

DePaul University is privileged to serve as the Editorial Office (EO) for *ENP*. We enjoy a wonderful and productive relationship with the National Association of Environmental Professionals (NAEP), and we admire the passion, commitment, and wise counsel of the NAEP Board, Association Manager Tim Bower, and the NAEP Publications Committee. We have a dedicated Editorial Advisory Board (EAB) that we call upon to review manuscripts, and they are most faithful in their service. Indeed, the quality of the journal in large part reflects the quality of the in-depth and constructive manuscript reviews provided by our EAB.

One of the main tasks of the EO is to work with the NAEP Publications Committee to identify topics and issues that we feel are of interest to the *ENP* readership, then present these topics to our readership in the form of themed issues. Past themed issues of *ENP* have been devoted to sustainability, fracking, environmental issues in China, the Great Lakes, and professional ethics. All of these themes were suggested to the EO by *ENP* readers! This thematic approach is vital to maintaining and sustaining the three “ships” of the NAEP: membership, authorship, and readership. Moreover, this tactic has been quite effective in bringing in new perspectives and topics on environmental issues to achieve greater interdisciplinarity, as well as maintaining the mission of the NAEP by providing quality articles that balance the interests of both the practitioner and the scholar in the environmental professions. Looking ahead, the December issue of *ENP* will tackle transportation issues.

It takes a lot of effort to produce a thematic issue of *ENP*, and we need your assistance. Please send us your ideas for interesting and relevant thematic topics in the field of environmental practice. Also, if you are particularly passionate about a topic, then consider signing on as a guest editor. Dan Carroll, *ENP*'s managing editor, has produced a set of guidelines for guest editors with the goal of making the guest editor process easy. Contact Dan if you are interested in serving as a guest editor.

*ENP* currently has five manuscript categories.

#### Peer-Reviewed:

Research Articles  
Environmental Reviews and Case Studies

#### Non-Peer-Reviewed:

Perspectives from the Field  
Reviews  
Dialogue

Beginning with the March 2016 issue, the journal will add the following categories:

## Counterpoint

Some of us old geezers will remember the “Point/Counterpoint” segment of the CBS program *60 Minutes*, featuring journalists Shana Alexander and James K. Kilpatrick, in which the two debated issues of the day from opposing viewpoints. For our *Counterpoint* category, the EO will be on the lookout for potentially discussion-generating articles, and, when we receive one, we would like to recruit authors to write a response piece to initial piece. These manuscripts would be similar in length to a *Perspectives from the Field* piece, in the range of 1,000–1,500 words. Each manuscript would, however, need to be grounded in literature citations in a way that a *Perspectives from the Field* piece is not, because the goal of a *Counterpoint* piece would be to respond to a cited, peer-reviewed article. However, these manuscripts themselves would not be peer reviewed. So if you wish to emulate Shana or James, then contact Dan Carroll! Let's engage in a rousing debate on hot-topic issues.

## Working Group

In this category, we will give the NAEP working groups an outlet to report their findings in the pages of *ENP*. These manuscripts will vary in length, according to the specific projects being reported on by the working group, but will be similar in length to our peer-reviewed manuscripts (roughly 5,000–6,000 words). These manuscripts would be peer reviewed.

## Student Perspective

Students are the future of NAEP. As such, we will work with the NAEP student chapters to provide students with an outlet for getting out their first peer-reviewed publication. Functionally, these manuscripts would be the same as our usual peer-reviewed manuscripts, but would be identified as a student work. Ideally, this series will highlight the work of up-and-coming student practitioners, aiding them in their future careers, and will also identify the NAEP as a beneficial organization for student practitioners (thus attracting future NAEP members).

## Career Development

This manuscript category would act as a topic-focused version of our *Perspectives from the Field* section. The NAEP has members who work in a wide variety of fields, all of whom can provide particular

insights into the future of careers in their industry. We would like to recruit these professionals to write short opinion pieces, in the range of 1,000–1,500 words, on career development, with advice for other working professionals. These manuscripts would not be peer reviewed.

If you have ideas for other categories, please let us know!

James Montgomery, Dan Carroll