

Scholars shed light on 'moving target' of drone regulation in the US

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For some, they're a hobby. For other people, they're tools. And for many, they're just a big nuisance. Love 'em or hate 'em, drones—or, unmanned aerial systems—are increasingly a part of life for millions in

the U.S. In fact, the Federal Aviation Administration estimates annual sales of drones should hit 7 million by 2020.

But a growing thicket of regulations and laws can make drone operation confusing for hobbyists, [commercial operators](#) and researchers who use drones.

"The FAA is supposed to be the ultimate authority on drones, and the National Transportation Safety Board is supposed to be involved if there are certain kinds of accidents," said Bill Johnson, professor of geography and [atmospheric science](#) at the University of Kansas. "But now you've got all these state and local regulations popping up or being proposed. For example, Oklahoma was trying to put this bill together allowing shootdowns, but it didn't go anywhere. The city of Raleigh (North Carolina) is considering pretty much banning drones in their parks. Back in 2014, the National Park Service said no to drones, unless you have a special use permit."

To help sort out the current "adolescence" of drone laws, Johnson and KU graduate student Dakota Burt recently published [new research in Earth Magazine](#) detailing myriad legal underpinnings of operating drones in the U.S.

"We read through everything we could find online, in newsletters and in the FAA documents pertaining to regulations—including the advisory circulars and memorandums," Johnson said. "It's an ever-evolving thing. When you look at FAA documents that have been addressing drones for a decade or so, you see there are all these contradictions. Some regulations said there's no cap on high they can go—or you just fly prudently. But now the regulations are pretty well set at 400 feet for drones, but a kite and balloon can go up to 500 feet. And the model aircraft thing is still a bit unclear."

According to the KU researcher, different sets of regulations apply to hobbyists and commercial operators of drones. However, both these groups must abide by a core set of rules.

"You always need to have visual contact with your drone—but you can't use binoculars, that doesn't work," Johnson said. "And there's the 400-foot limit, and at least three-mile visibility. Also, you can't go over 100 mph. Of course, you can't carry hazardous materials or weapons. And you can't fly within five miles of an airport. These rules apply to drones between .55 and 55 pounds. Over 55 pounds, it's a whole new ballgame."

Johnson recommends the "B4UFLY" [smartphone app](#) developed by the FAA to help drone operators check the status of their location for drone operation. His own passion for drones stems from his work using them extensively in geology and landform analysis.



Credit: University of Kansas

"I'm a physical geographer," he said. "I work in more recent geologic time, not 'deep geologic time.' With my interest in landscapes and the sediments below, I've worked in lots of counties here in Kansas. I'm interested in landscapes—and being able to document them is a fascination. With a drone, you can create 3-D models or get a new perspective on a rock outcrop or sand dune or river meander by collecting photographic data."

Johnson said he hopes to get a forward-looking infrared system that will pick up on differences in heat to map landforms and soil. "Drones are a neat new tool, and the whole field is going crazy for them—geologists and landscape people."

Academics and researchers fall mostly under these [drone](#) regulations that apply to commercial users, according to Johnson. Thus, he recommends they obtain a Part 107 remote pilot certificate. The certificate requires the applicant to be a U.S. citizen older than 16, have no disabilities inhibiting UAS operation, pass an aeronautical knowledge test and a TSA screening.

"It's really pretty simple," he said. "There's clarification in a memorandum because academics didn't know if they were deemed hobbyist or commercial users. It made it clear if you're getting paid to teach a course and using drones to teach that's a commercial endeavor. Scholarly research also is commercial use—it's too close to the edge."

Johnson himself has obtained the certificate for his work, including the

certification for operating drones at night, after taking a week-long course and passing a two-hour FAA exam.

This fall, Johnson will teach a KU course on drones with two faculty colleagues in the Department of Geography & Atmospheric Science, Stephen Egbert and Xingong Li.

"It'll be about all the rules and regulations that apply," Johnson said. "Safety and how to take care of them and so on. From there, become familiar with flying them. We've purchased some [DJI Phantom 4 Pros](#), the newest generation of these popular white drones. That's the workhorse they'll be learning on first, here at the band practice fields on west campus. We'll be laying out the orange kiddie soccer cones, and they will have to fly that pattern of cones sideways, turning, rising and dropping while moving and practicing getting imagery. Once they're deemed safe and reasonably good pilots, students will go out in small teams with an assigned project to collect imagery for constructing 3-D models of landscapes or structures."

Students will be directed toward obtaining commercial certification if they plan to operate drones for research or other commercial ventures down the road.

Provided by University of Kansas

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