

Preface

The increasingly massive spread of small drones in the general market accompanies a rapid evolution of payload hardware and software. From photo/video to multi-spectral sensors, to environmental measurement devices, up to mechanical operation peripherals, even basic drones are getting more sophisticated and miniaturized at the same time. The recent advent of minimal-sized professional drones is specifically to be taken into account, as it can make a substantial difference in terms of usability.

There is some variability about the technical name assigned to these machines. This is generally due to the emphasis put on specific aspects of their nature or goals. The most widespread name of “UAV” (unmanned aerial vehicle) is very general and could apply to any machine able to fly without a crew; the focus in this case is on the aircraft itself. “UAS” (unmanned aerial system) generally implies that the vehicle is part of a wider system, involving a ground control station and possibly other components; “RPV” (remotely piloted vehicle), “RPA” (remotely piloted aircraft), and “RPAS” (remotely piloted aerial system), and their national language variants, emphasize that the vehicle is actively piloted from a remote station.

From a strictly ontological point of view, a difference is admitted between UAVs, in general, and RPAS. The latter are “remotely piloted” while the former could be any kind of aerial vehicle without an onboard crew. This includes then the types of platform which can be taken into the air but with no control whatsoever by a ground crew: free-flight balloons and airplanes, some types of rockets, etc. The distinction is substantial, but current use tends to converge on “UAV” in scientific contexts and “drones” among laymen, so we prevalingly stick to these two names.

Obvious applications can be found, from basic cartography and photogrammetry to specific fields of environmental studies and physical geography. The data acquisition capabilities of drones can also be applied to phenomena which are interpretable in terms of human geography. From “thinking” of a specific survey to actually “doing” it, however, a lot of nuts and bolts are to be put into place.

Meanwhile, aviation authorities all over the world are dealing with the complex task of regulating a set of technologies whose fast development often outruns the

ability of setting rules for them. Once a regulation is issued, chances are it was developed around a specific concept of drones; but it frequently turns out that drone technology has already gone farther. This way, the recently created rules tend to freeze technological development at a certain stage, hampering – de facto – the full development of new tools in many fields.

We are experiencing the actual “dawn of the drones,” and their application potential is boosting everyday. If UAVs are to be acquired as long-living standard tools in geography-related investigations or applications, then it is worthless to get too deep into current implementations or regulatory stages. Rather, concepts, opportunities, and issues are to be considered in a more general sense.

This book does not try to establish recommended solutions for all cases; it specifically introduces concepts about flying small drones (not *any* drone) in some fields (not *any* field) of geographic and geography-related observation. It will therefore take into account questions, answers, and perspectives that directly involve operators as they plan their work before they get to the field.

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The Editors

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