



sUAS and fluvial remote sensing: Are we losing track of important questions?

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Small Unmanned Aerial Systems (sUAS) have now become the de-facto approach for fluvial remote sensing data acquisition. Their low-cost and ease of deployment has decimated the more traditional usage of manned aerial platforms for the acquisition of high resolution imagery data. However, in the course of this methodological gold rush, has the river sciences community been losing sight of some critical research questions that prompted the development of fluvial remote sensing in the first place? This presentation will consider the modern uptake of sUAS in the river sciences in the light of some of the initial objectives of fluvial remote sensing that emerged in the late 1990s. At the core of the discussion will be fundamental concepts of spatial and temporal scales that underpin catchment processes. In the 1980s and 1990s, conceptual frameworks such as the seminal River Continuum Concept and the 'Riverscapes' concept were making a strong argument for synoptic approaches where catchments were seen as whole or single entities. Early authors recognised that the testing of hypotheses within these frameworks would require datasets that are both extensive in scale and of high resolution. These ideas are the early drivers for the development of fluvial remote sensing. Through specific methodological examples such as sUAS-based substrate size mapping and water depth mapping, we will attempt to deliver a frank assessment of the strengths and weaknesses of sUAS as remote sensing platforms in fluvial sciences. We will discuss the obvious scale limitations of sUAS from a technical and legal point of view. Finally, we will propose potential solutions and research avenues that could strengthen the role of sUAS as valuable tools that are directly capable of addressing some fundamental questions in the fluvial sciences.