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A spatial-temporal method for assessing the energy balance dynamics of partially sealed surfaces.

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The effects of different types of sealed surfaces on the surface energy balance have been well-studied in the past. However, these field studies typically aggregate these surfaces into continuous units. The proposed method seeks to disaggregate such surfaces into paving and seam areas using spatial methods, and to consider the temperature dynamics under wet and dry conditions between these two components. This experimental work is undertaken using a thermal camera to record a time series of images over two lysimeters with differing levels of surface sealing. The images are subsequently decomposed into component materials using object-based image analysis and compared on the basis of both the surface materials as well as the spatial configuration of materials. Finally, a surface energy balance method is used to estimate evaporation rates from the surfaces, both separately for the different surface components as well as using the total surface mean. Results are validated using the output of the weighing lysimeter. Our findings will determine whether the explicitly spatial method is an improvement over the mean aggregate method.