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# Extracting building characteristics for natural hazard loss estimation using remote sensing

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Capturing the characteristics of building exposure is one of the major challenges for loss estimation. In the past decade, the resolving power of the commercially available remotely sensed data has improved rapidly at a rate that is analogous to Moore's law. Willis Research Network is currently considering how the improved datasets can be harnessed to extract the building characteristics in the most economical way, taking into account the uncertainty inherent in the results. For loss estimation, another important aspect is to be able to assess the risk in a standardised way. A building inventory characterisation methodology using remote sensing that can be standardised at a global scale is desired.

The increase in the resolving power of the remotely sensed data has provided us with more options when considering extraction strategies. However, it is inevitable that tradeoffs are made between the quality and the time required for analysis as well as the cost of data acquisition. The ultimate goal here is to investigate the most cost-effective method.

As the first step, a case study using the Pylos high-resolution optical satellite images is being conducted on the town of Pylos, located on the west coast of Greece in Peloponnesos. Pylos has approximately 1000 buildings and a ground survey of most of the buildings was conducted as part of the EU funded SEAHELLARC project, which aim is to assess the earthquake vulnerability of the buildings. Subsequently, a Quickbird high-resolution optical satellite image of the entire town was obtained to explore the relationship between the physical characteristics of the buildings that can be extracted using the image and the ground survey results. Currently, the following four parameters: floorspace, height (number of storeys), age and structure type, are the focus of this study which are the key parameters for earthquake vulnerability studies. Initial results from the study suggest that there is a high correlation between the geometric shape and colour of the roofs with the structure types for the buildings in the town of Pylos. Other results, as well as plans for future work will be described.