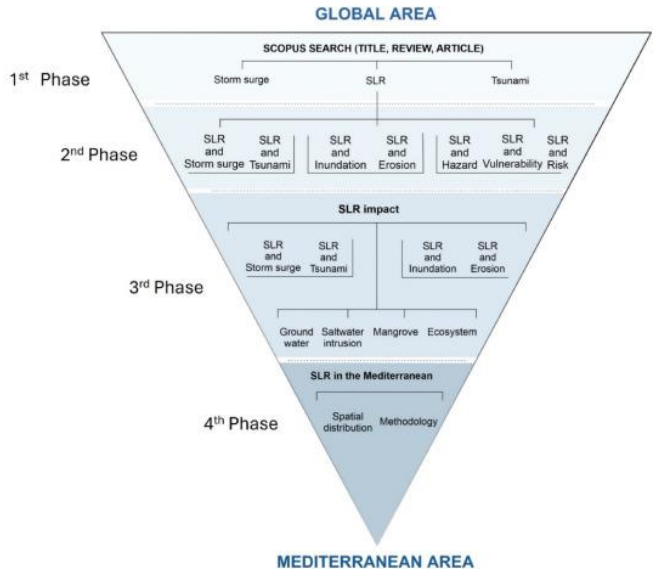
Methodological advances in sea level rise vulnerability assessment: implications for sustainable coastal management in a climate change scenario

Summary

Sea level rise (SLR) is one of the most evident consequences of global warming. Low-lying coastal areas with mobile coastal systems are particularly exposed to sea level change (SLC), both transient (storm surges and tsunamis) and permanent (SLR), especially when coupled with vertical land movements (VLMs), determining local relative sea level rise (RSLR). In this study, starting from a critical analysis of methods exploited for the assessment of the vulnerability to RSLR and their suitability, a tailored approach for the impact assessment as an operative tool for the management of coastal areas in a changing climate is proposed. Our analysis was carried out through the evaluation of 49 selected studies, which were included in a specifically implemented database by searching in Scopus. This insight shows that the static approach represents the most popular method for the analysis and visualization of the expected coastal modifications, followed by the model-based approach. Furthermore, the evaluation of the suitability level of each accounted method highlighted that topographic and index-based methods are significant for regional analyses, whilst model-based approaches are strongly exploited for site-specific analyses. Based on the outcomes of this analysis, a multi-step procedure for coastal zone management is proposed.



Methodological approach applied to implement the database of peer-reviewed papers dealing with the SLR at the global and the Mediterranean scale.

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