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## **Tsunami building vulnerability assessment after the 16S 2015 event in the cities of Coquimbo – La Serena (Chile)**

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The Chilean coast is vulnerable to the impact of near-field tsunami events due to its subduction geodynamic context. The cities of La Serena and Coquimbo (Coquimbo Bay, Chile) have been historically affected by tsunamis what, together with the scarce land and urban management plans, make them great examples for the assessment of the tsunami building vulnerability. In this study, we use the PTVA-3 and PTVA-4 models to assess the building vulnerability to a tsunami after being adapted to the construction of northern Chile to compare their results with the damages caused by the September 16, 2015 tsunami. The flooding affected 1,239 buildings with a maximum flood height of 3.5 m. The PTVA-3 model obtains higher Relative Vulnerability Indices (RVI) than the PTVA-4. For the first, only 5.5% of the buildings are classified as “High” or “Very high” whereas 63.6% of them present a RVI score of “Minor” or “Moderate” as they present lower inundation heights or are located at higher topographic levels. On the other hand, the PTVA-4 model classifies 83.5% of the buildings as “Minor” or “Moderate” and only 1.3% as “High” or “Very high”. We have evaluated these results by comparing them with the real damage occurred in the cities using the information provided by the Ministry of Housing and Urban Planning (MINVU). The PTVA-3 model results are more similar to the real damages occurred after the September 16, 2015 in Coquimbo – La Serena whereas the PTVA-4 underestimates the building damages. This study represents a first step towards the development of mitigation and response measurements related to a tsunami impact.