B213

LONG-TERM ASSESSMENT OF RELATIVE SEA-LEVEL VARIABILITY CONSIDERING TECTONIC DEFORMATIONS, SEA-LEVEL RISE, STORM SURGE, AND OCEAN WAVES: THE CASE STUDY OF THE CHILEAN COAST.

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INTRODUCTION

Chile is one of the most seismic countries worldwide, with approximately 86.000 km of coastline and a permanent need for development and management. Because of the Nazca plate subducting the South American plate, coastal evolution is modeled by oceanographic variables and plate tectonics. Coastal towns are under permanent tsunami and storm risks, unregulated real estate development, and climate-driven sea-level rise (SLR). IPCC AR6 SSP5-8.5 scenario summarized future trends in Global Mean Sea-Level Rise (GMSLR) of ~0.1 m in the near term (2021-2040), ~0.2 m in the medium term (2041-2060), and ~0.6 m in the long term (2081-2100) along the coast. However, relative sea level is affected by large coseismic uplift and/or subsidence which may be comparable to or larger than SLR (Montecino et al., 2017).

METHODS AND RESULTS

Using satellite and tidal gauge data, a comparison between the AMSL and relative mean sea level (RMSL) was conducted for different locations along the Chilean coast between 1993 and 2020(Figure 1). Merging the satellite altimetry and the tide gauge measurements were done (Cazenave et al.,1999) to obtain vertical land motions (VLM) rates at the tide gauge positions. A trend analysis of the monthly values was compared with GPS stations for each data set.

The earthquake occurrence was obtained from measurements along the coast and compilation InSAR

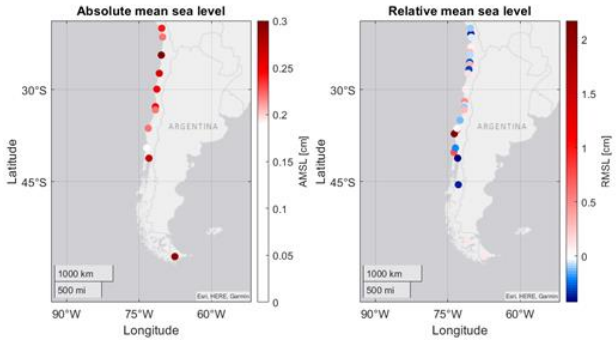

Figure 1: Relative se level vs absolute sea level rise

works. A combination of RMSL estimations, coseismic displacements, and GMSL projections under the SSP5-8.5 scenario was conducted to estimate possible changes in the RMSL along the Chilean coast as well as the analysis of the oceanographic agent's contributions along the coastal area

Storm Surge, Waves, and Wave Run up were also calculated from JR-55 Reanalysis data. For different periods of time with lengths of 60 and 40 years respectively the impacts, trends, and variability of oceanographic agents along the Chilean coast were analyzed to understand the vertical changes affection.

CONCLUSIONS

RMSL strongly varies while the AMSL maintains similar values along the Chilean coast. VLMs were obtained to compare the motion rates of the crustal surface with those projected by SLR. The possibility that large earthquakes could generate coseismic displacements affecting different sites with different orders of magnitude directions (uplift and or Subsidence)

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