

Reconstruction of extreme events (storms, floods and tsunamis) from the coastal sedimentary files in the Coquimbo region, 30 ° S, Chile.

Karen Araya ^{* 1,3}, Laurent Dezileau ², Praxedes Muñoz ³, Antonio Maldonado ⁴, Kevin Pedoja²

¹ Laboratoire de Geosciences, Université de Montpellier, Francia

² Laboratoire de Morphodynamique Continentale et Côtière, UMR CNRS 6143 M2C, Université de Caen-Normandie, Francia

³ Facultad de Ciencias del Mar, Universidad Católica del Norte, Chile

⁴ Centro de Estudios Avanzados en Zonas Áridas (CEAZA), Chile

Abstract:

Floods, extreme storms and tsunamis are natural disasters that have marked the history of the Chilean coast. The recent flood event that hit several regions in northern Chile occurred in 2015, where the Atacama region was the most affected, causing the death of some 28 people, the disappearance of 48 people and economic losses estimated at \$ 1.5 billion.

One of the characteristics of these extreme events is their ability to leave sedimentary traces that can be studied and dated to know their spatial and temporal evolution, which is necessary for the implementation, adaptation and mitigation strategies to protect the population from future events.

In this study, we analyzed sedimentary files collected in the Coquimbo region to identify sedimentary traces of extreme events that affected the Chilean coast. Analysis of granulometry (laser granulometry), geochemistry (XRF) and chronology (¹⁴C, ²¹⁰Pb and ¹³⁷Cs) were performed. The grain size and geochemistry results showed the presence of seven alluvial levels characterized by high K content and fine grain size and two events of marine origin were visualized, characterized by coarse grain and high content of Ca and Sr. The dating of these levels is in progress to identify the time in which they occurred.

Project: FONDECYT-1180413/ FONDECYT-1140851/ClapPrograme

Keywords: Storms, Floods, Tsunamis, Chile.