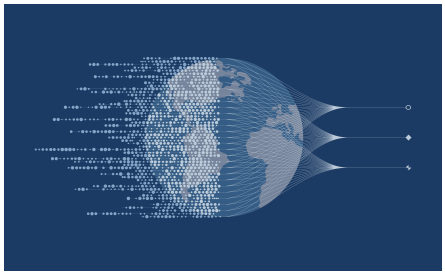

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Seismicity in Southern Brazil: Analyzing the Nature of Events

The southern region of Brazil, comprising the states of Rio Grande do Sul (RS), Paraná (PR), and Santa Catarina (SC), exhibits low seismic activity compared to other regions of the country. However, it has experienced significant events over time. Notable earthquakes include a magnitude 5.9 event in 1939 on the continental margin, a magnitude 5.5 event in 1948 near the Uruguay border, and a magnitude 5.2 event in 1990. In total, over 30 events with magnitudes exceeding 3.5 have been recorded across the region. The region is predominantly within the Paraná Basin, characterized by Mesozoic sedimentary rocks and Precambrian crystalline basement. Additionally, the region has experienced five cases of seismicity induced by reservoirs (SIR): Machadinho, Itá, and Barra Grande, all in SC; and Capivari and Capivara, in PR. The largest reservoir in the area, Itaipu, has not reported any cases of reservoir-induced seismicity (RIS). This study aims to provide a comprehensive analysis of the seismicity in southern Brazil, investigating its nature, causes, and the influence of geological and anthropogenic factors using data from the Brazilian seismic catalog SISBRA.

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