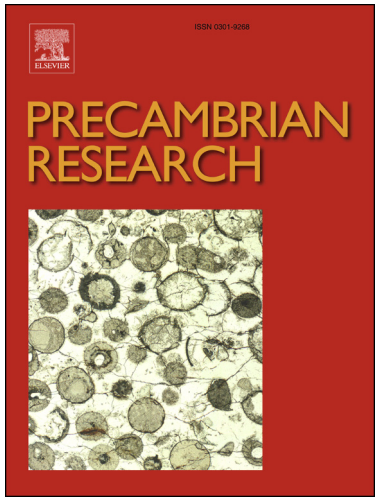

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Paleoproterozoic andesitic volcanism in the southern Amazonian craton, the Sobreiro Formation: new insights from lithofacies analysis of the volcaniclastic sequences.

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Abstract

The Sobreiro Formation (SF) records one excellent and well-preserved example of subaerial Precambrian (ca. 1.88 Ga) volcanism on earth. It is located in the São Felix do Xingu region (SFX), in the eastern part of Pará State, southern Amazonian Craton, northern of Brazil. The high-K calc-alkaline composition of the Sobreiro rocks indicates that this formation likely generated in an ocean-continent convergent margin. This paper documents the architecture of a series of basaltic-andesite to andesite and minor dacite lava flows and associated volcaniclastic rocks. These rocks are divided into primary and secondary lithotypes, depending if they resulted from a direct volcanic activity (pyroclastic) or reworked processes and massive to stratified, depending on the different transport and emplacement mechanisms. Primary lithofacies is formed of pyroclastic flow and surge deposits, volcanic breccias and welded ignimbrites; secondary volcaniclastic litofacies consist of reworked debris. Mass-flows, hyperconcentrated flows and stream floods are interpreted as fluvial/alluvial deposits representing periods of stream and river reworking and re-establishment after an eruptive phase or an edifice failure event. These different lithofacies record the volcanic history of the Sobreiro formation. A complex volcanic environment is thought to have existed with emission of large lava flows and explosive eruptions. The modern volcanological approach used here can serve as a model for the evolution of Precambrian volcano-sedimentary basins. Our approach sheds new light on the different processes operating on volcanic edifices and to constrain the depositional environment and thus geodynamic setting of