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Evolution of Copahue volcano eruptive activity based on the surveillance by Landsat satellite images

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Copahue volcano has undergone four eruptive periods between 2000 and 2016, which have been characterized by the occurrence mainly of phreatic and phreatomagmatic eruptions, producing the total vaporization of the acid lake, and the emission of juvenile products. In this work, we have carried out an extended surveillance based on the processing of Landsat TM, ETM+ and OLI images, determining its thermal radiance produced from the active crater, with the objective to establish the evolution of the eruptive process between 2000 and June 2016. One of the most important observations have been the absence of precursors signals in the satellite images, being the thermal anomaly recognized exclusively since the beginning of the eruptive process. The first eruptive period (July-October 2000) presented a thermal radiance between 52 and 155 W/m²sr_{μm}. After twelve years of quiescence, a new eruptive period started in December 2012, lasting by almost ten months, with thermal radiance between 21 and 129 W/m²sr_{μm}. The eruptive activity restarted in July 2014 and finishing in November 2014, with thermal radiances ranging 0.43-80 W/m²sr_{μm}, being its values less intense than December 2012-October 2013 period. A renewed eruptive activity started in October 2015, which has been ongoing at least at June 2016. This last eruptive period presented a thermal radiance highly variable, with values ranging from 1 to 583 W/m²sr_{μm}. The last eruptive period has presented the more intense thermal radiance values between the four periods, probably related to the absence of acid crater lake, the presence of an open vent and the occasional appearance of a small size lava lake. Consequently, new eruptive activity cannot be ruled out in the next months.