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Tephrochronological data from Lanin National Park: Towards a reconstruction of the Holocene volcanic history of Northern Patagonia, Argentina

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We present the first findings that make the reconstruction of the Holocene volcanic history for the Lanín system possible, as well as a first estimate of the territorial extent of the impact of explosive eruptions in the Lanín National Park area, by identifying the resulting tephra deposits and corresponding eruptive center. Three minor volcanic centers (La Angostura and Arenal cones, and the Achen Ñiyeu volcano with its associated lava flow), together with Lanín and Quetrupillán stratovolcanoes, are the main active volcanoes with Holocene explosive activity in the area, corresponding to the Villarica-Lanín volcanic system. Short cores from Huaca Mamuil (HM) and Huechulafquen lakes together with road-cuts and exposures north and south of Lanín volcano were studied and AMS dated. Twelve ashfall deposits were identified and characterized. A flow deposit overlain by a tephra fall layer exposed in several road-cuts in Curruhue area, was dated at 9560-10520 cal yr B.P. El Escorial lava flow, originated in the Achen Ñiyeu cone, was dated with a maximum age at 1260-1060 cal yr B.P. A dacitic tephra identified in HM cores is attributed to the Quetrupillán volcano last major eruption (ca. 1650 yr B.P.) and is used as chronostratigraphical marker. Several other tephra layers are attributed to La Angostura cone according to their petrographic characteristics. The youngest tephra identified in the cores corresponds to the 2015 Calbuco eruption. Further work is being carried out to complete this reconstruction in order to improve volcanic hazard assessments for this emblematic region.