

Cariño Botado Fault: Quaternary tectonic activity record on the western edge of the Principal Cordillera, central Chile (32°47'S)

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1. RESUME

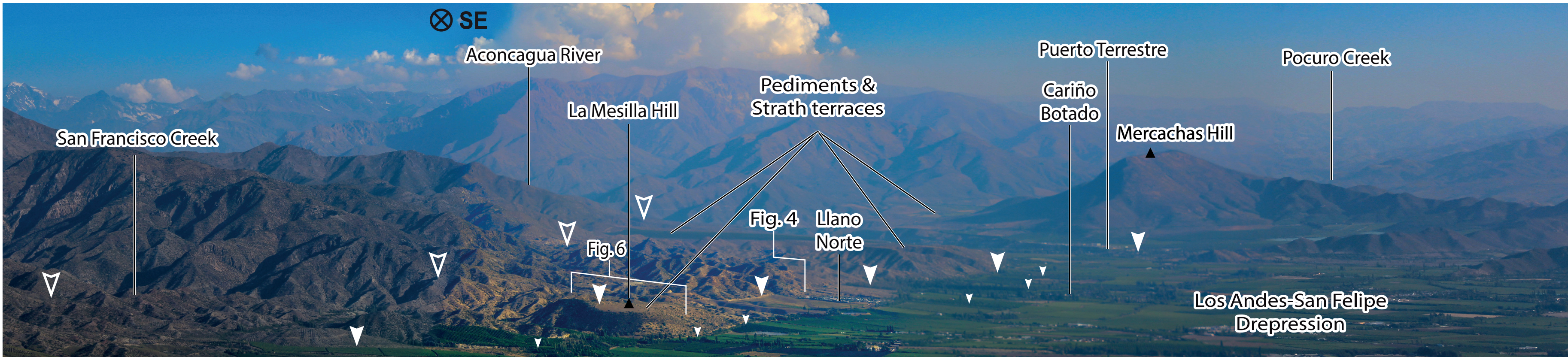


Fig. 1: General panoramic view of the mountainous front to the east of the Los Andes-San Felipe Depression (Estay, 2019; Estay et al., in prep.).

In the mountain area to the east of the Los Andes-San Felipe Depression, the trace of a well preserved Quaternary fault and with an excellent morphological record, the **Cariño Botado Fault**, can be recognized (Fig. 1).

2. BACKGROUND

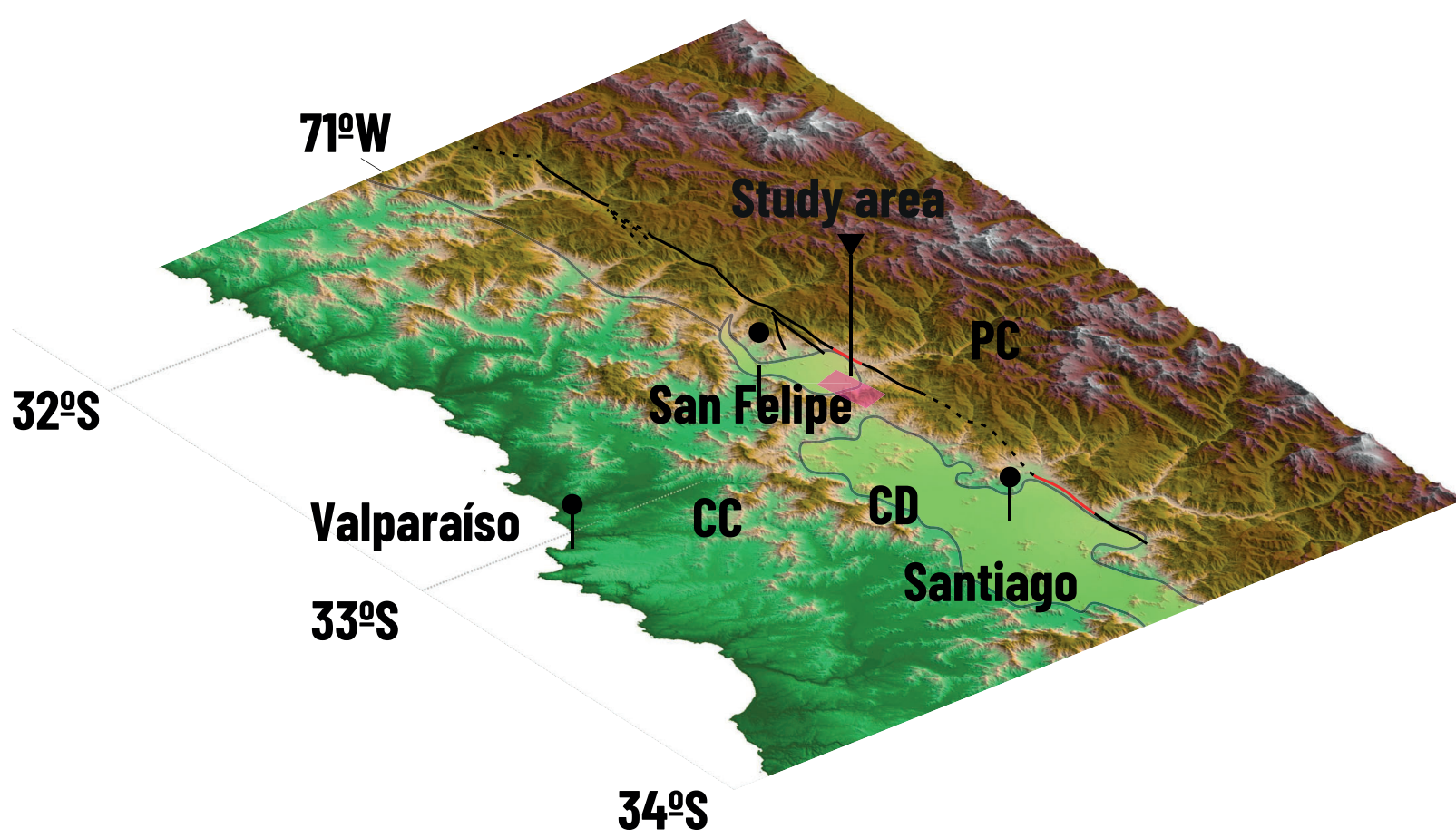


Fig. 2: Study area (magenta polygon) and its morphostructural context. Principal Cordillera (PC), Coastal Cordillera (CC) and Central Depression (CD) (modified from Estay et al., 2018). The trace of the Pocuro Structural System is indicated (Carter & Aguirre, 1965; Rivano, 1993; Mpodozis et al., 2009).

Study area: ~75 km north of Santiago and ~16 km east of San Felipe.

First description: The Cariño Botado Fault (CBF) was first described by Troncoso (2014) in the Llano Norte sector, in the vicinity of Cariño Botado.

Geology: The Cariño Botado Fault is located in the Principal Cordillera (Fig. 2), on the main trace of the Pocuro Structural System (PSS; Carter & Aguirre, 1965; Rivano et al., 1993), and affects Cenozoic units (Fm. Abanico; Canals, in prep.).

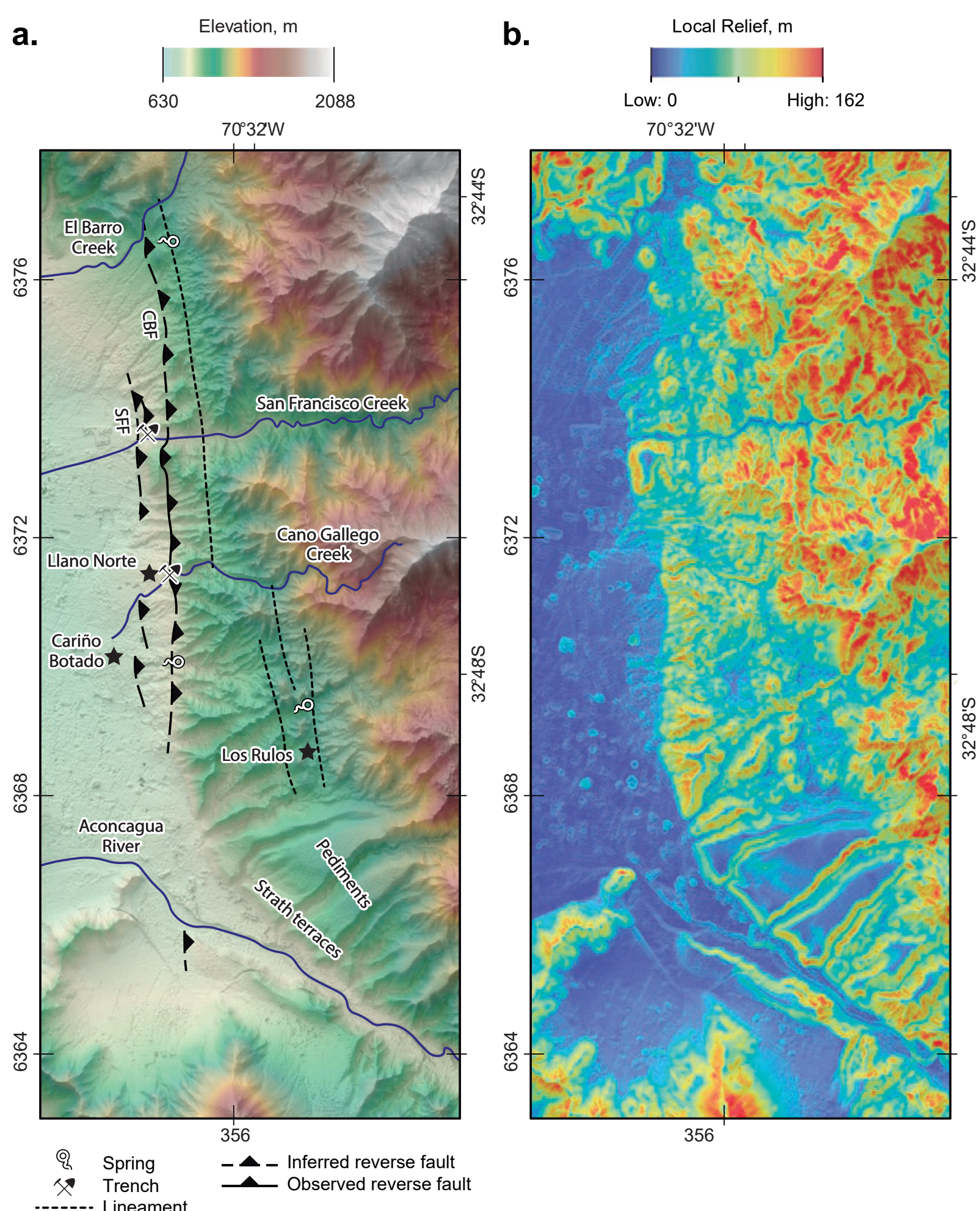


Fig. 3: Geomorphological maps showing the Cariño Botado Fault (FCB) and San Francisco Fault (FSF), lineaments and relict mountain front (Estay, 2019). (a) Shaded relief image and elevation. (b) Local relief calculated in a circular window of radius 50 m. Topographic base: own digital elevation model of 4 m/px.

3. RESULTS

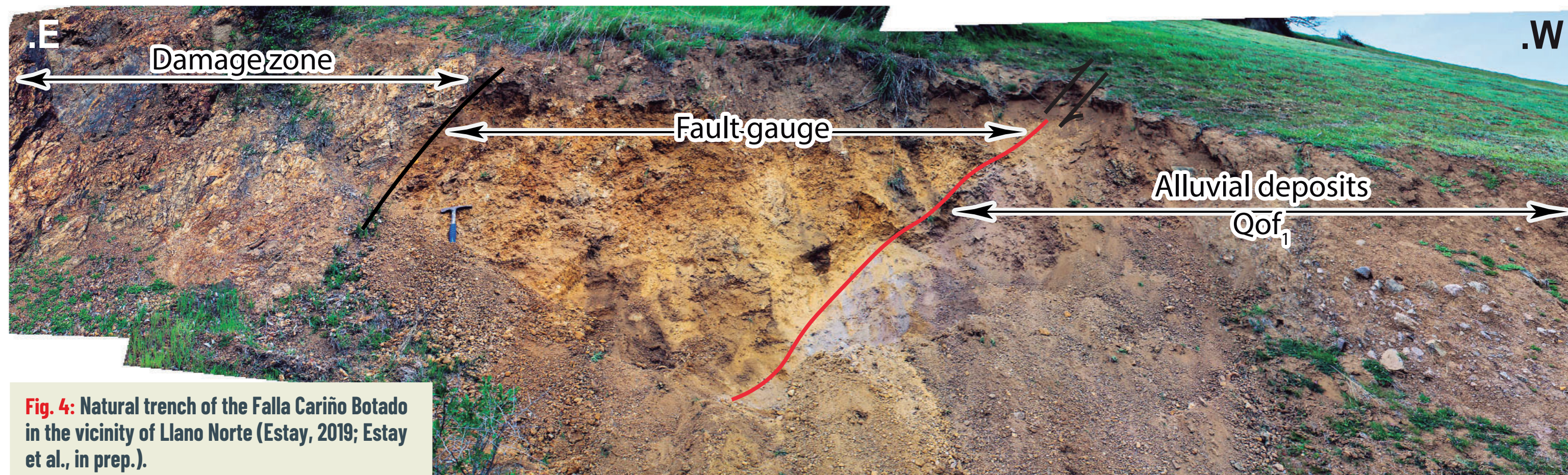


Fig. 4: Natural trench of the Falla Cariño Botado in the vicinity of Llano Norte (Estay, 2019; Estay et al., in prep.).

Through remote sensing (Fig. 3) and terrain analysis, these results were obtained:

- Quaternary alluvial fans (Qof1, Figs. 4 and 5) tilted towards the west due to tectonic deformation of the CBF.
- A N-S segment of the CBF approximately ~7.5 km long is recognized (Fig. 3a).
- It is determined that the main movement of the fault is reverse vergence to the west (Figs. 4 and 5).
- A general fault dip of ~40°E is estimated (Fig. 4).
- A ~30 m high escarpment is determined (Fig. 6) on the trace of the Cariño Botado Fault.
- Further west (~500 m) of the CBF, fluvial deposits (Qovf, Fig. 6) hanging ~100 m above the main fluvial valleys of the study area (San Francisco Creek and Aconcagua River).



Fig. 5: Southward view of tilted Quaternary alluvial deposits. Note the strata drifting to the west, from the topographic break that represents the trace of the Cariño Botado Fault (Estay et al., in prep.).

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4. DISCUSSIONS

The main points of discussion of the study of the Cariño Botado Fault and associated faults are:

- 1) The fluvial deposits perched in the main fluvial valleys would register a regional uplift of the western edge of the Principal Cordillera of ~100 m, west of the Cariño Botado Fault.
- 2) The ~30 m high escarpment on the trace of the Cariño Botado Fault (Fig. 6), would reflect that this structure has a long history of tectonic activity.
- 3) The record of the alluvial fans tilted on the trace of the Cariño Botado Fault corresponds to the most recent activity of this fault in the Llano norte sector, and that would account for a continued uplift of the Principal Cordillera, with vergence structures to west.

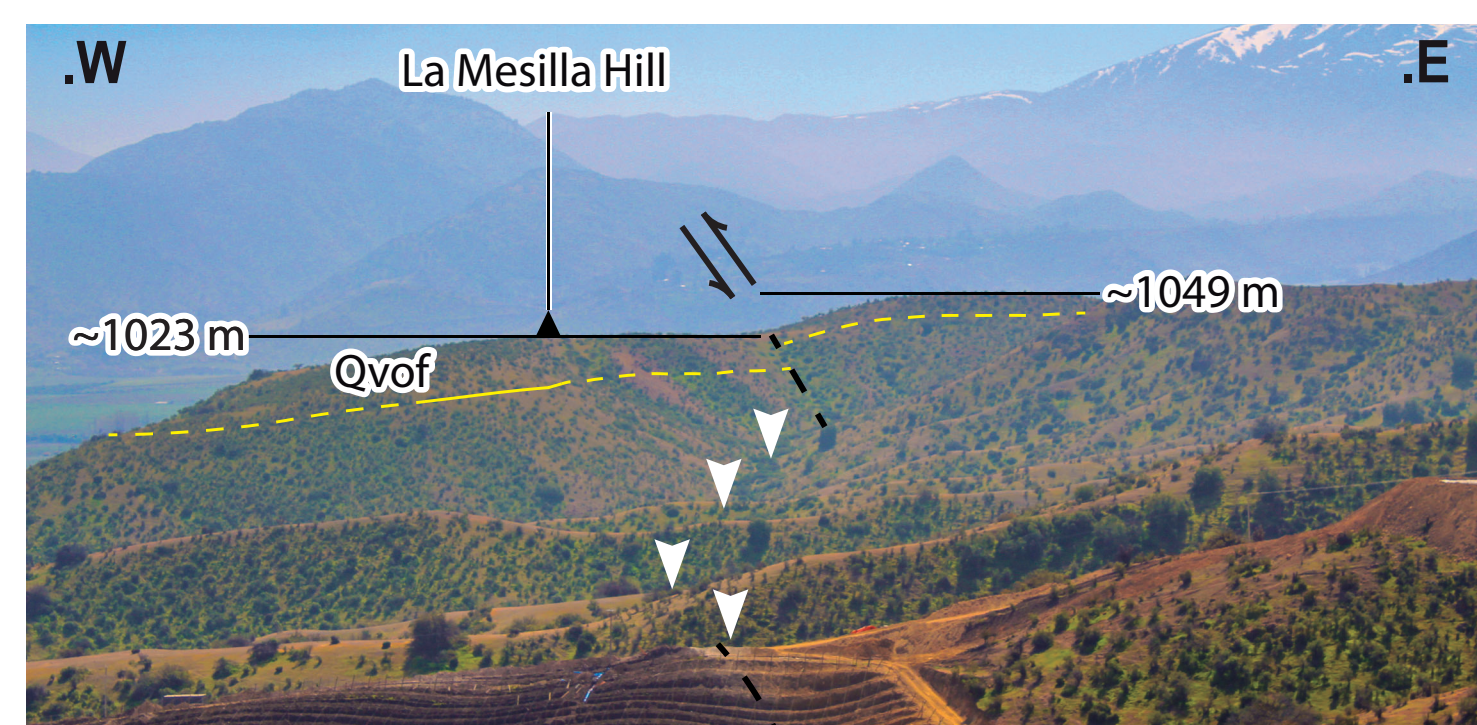


Fig. 6: Profile view of the stratum terrace of La Mesilla hill and its dislocation due to the movement of the Cariño Botado Fault (Estay et al., in prep.).

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