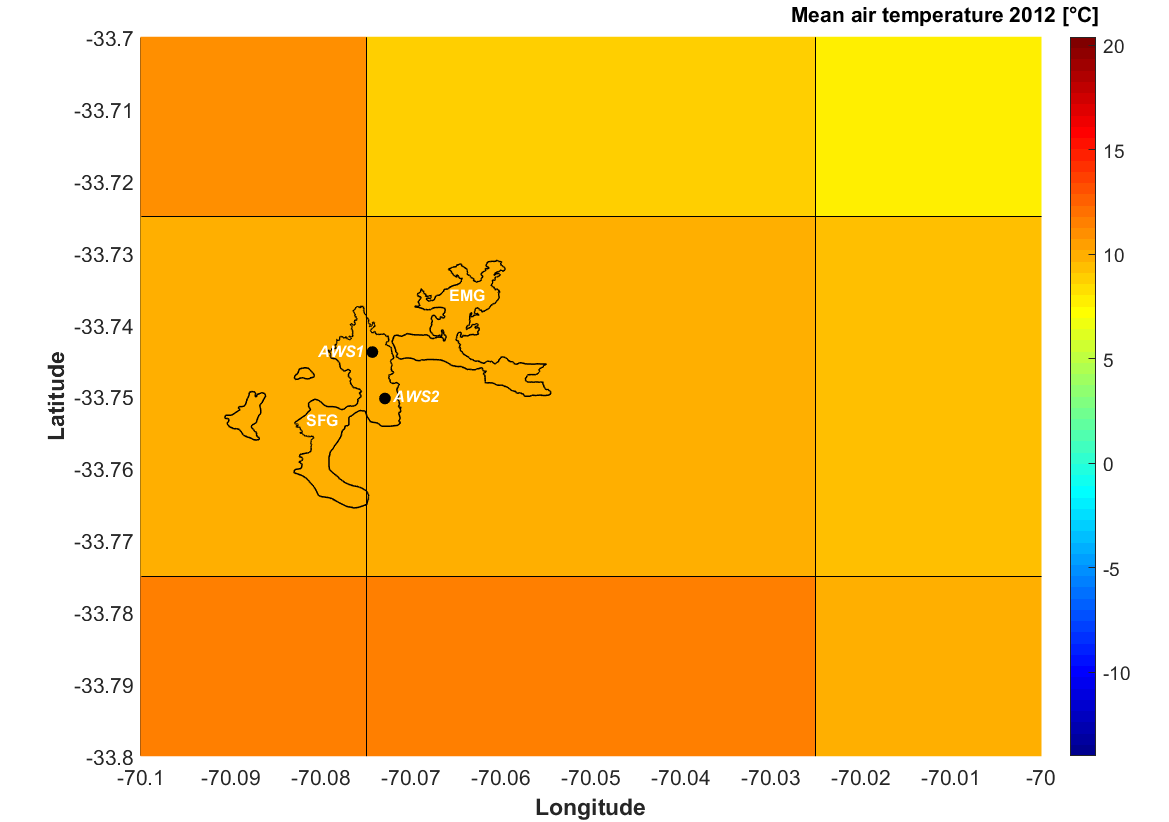
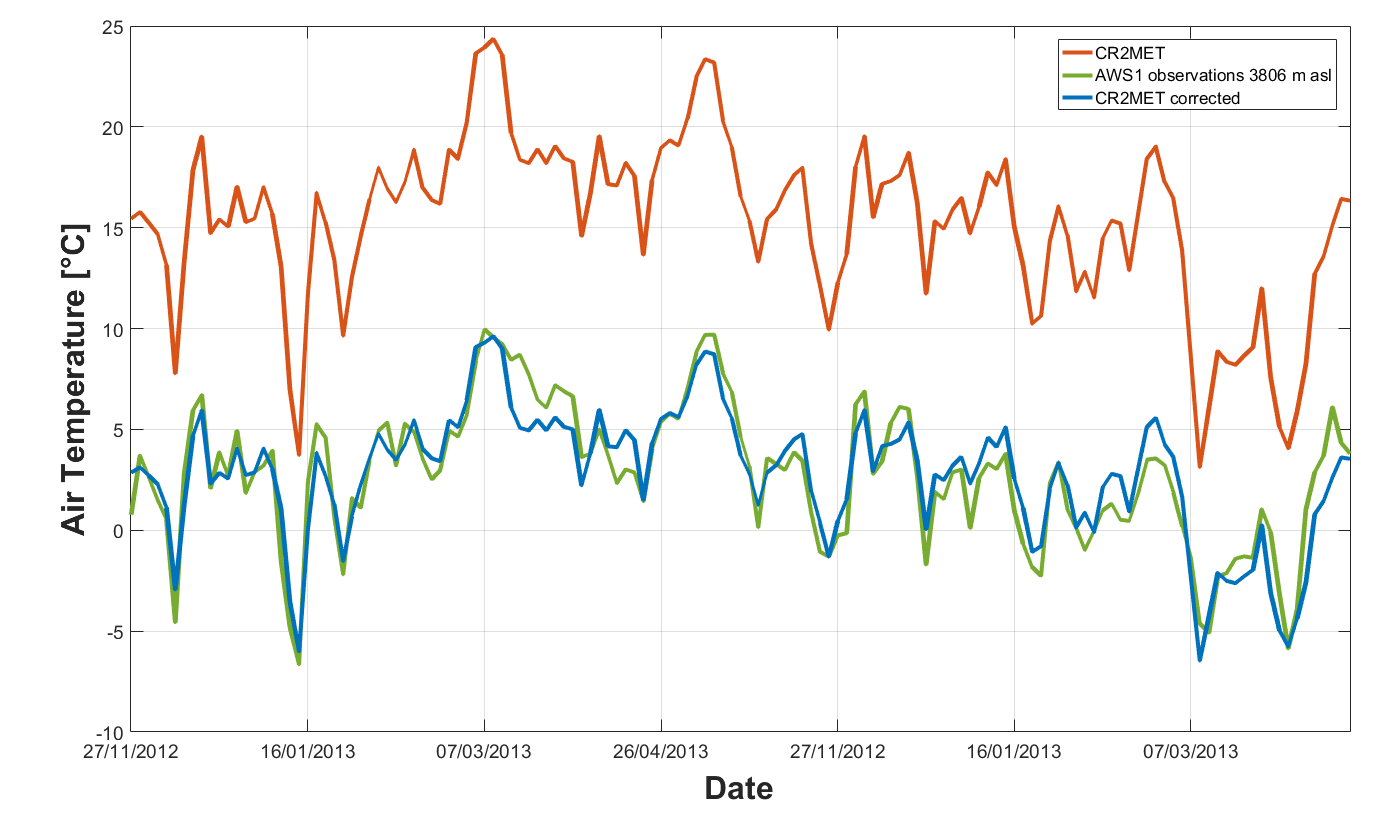
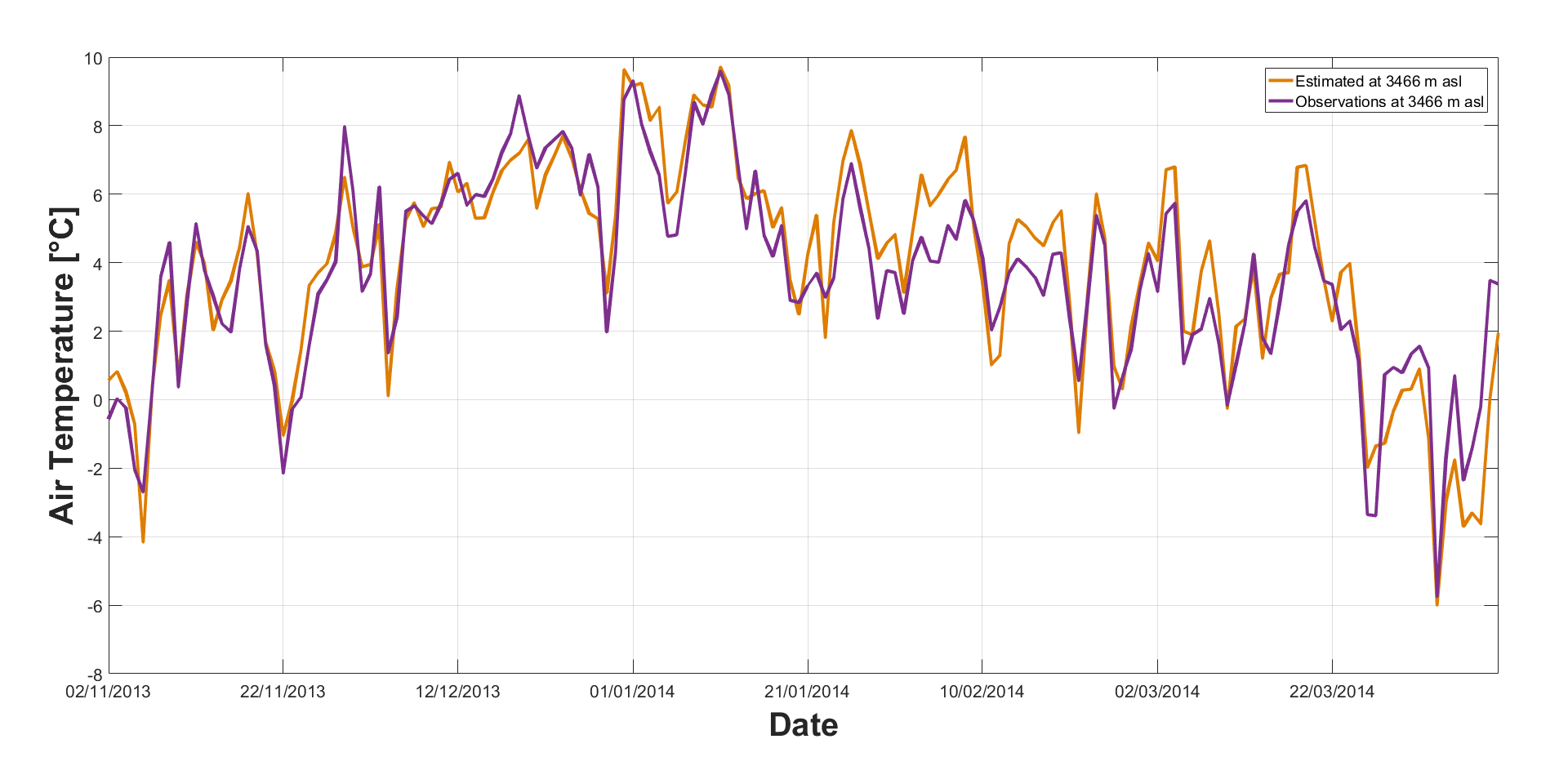
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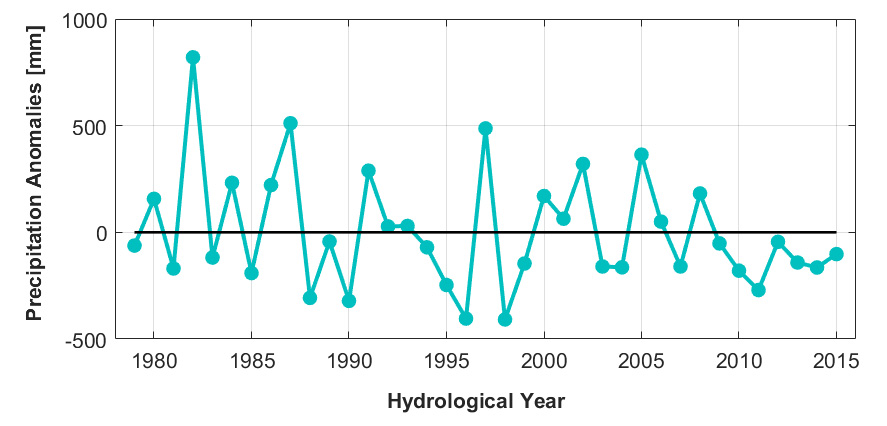
**Figure S1.** CR2MET air temperature grid and glacier outlines of the San Francisco Glacier (SFG) and El Morado Glacier (EMG). The Automatic Weather Station 1 (AWS1) and 2 (AWS) are both located over the SFG.

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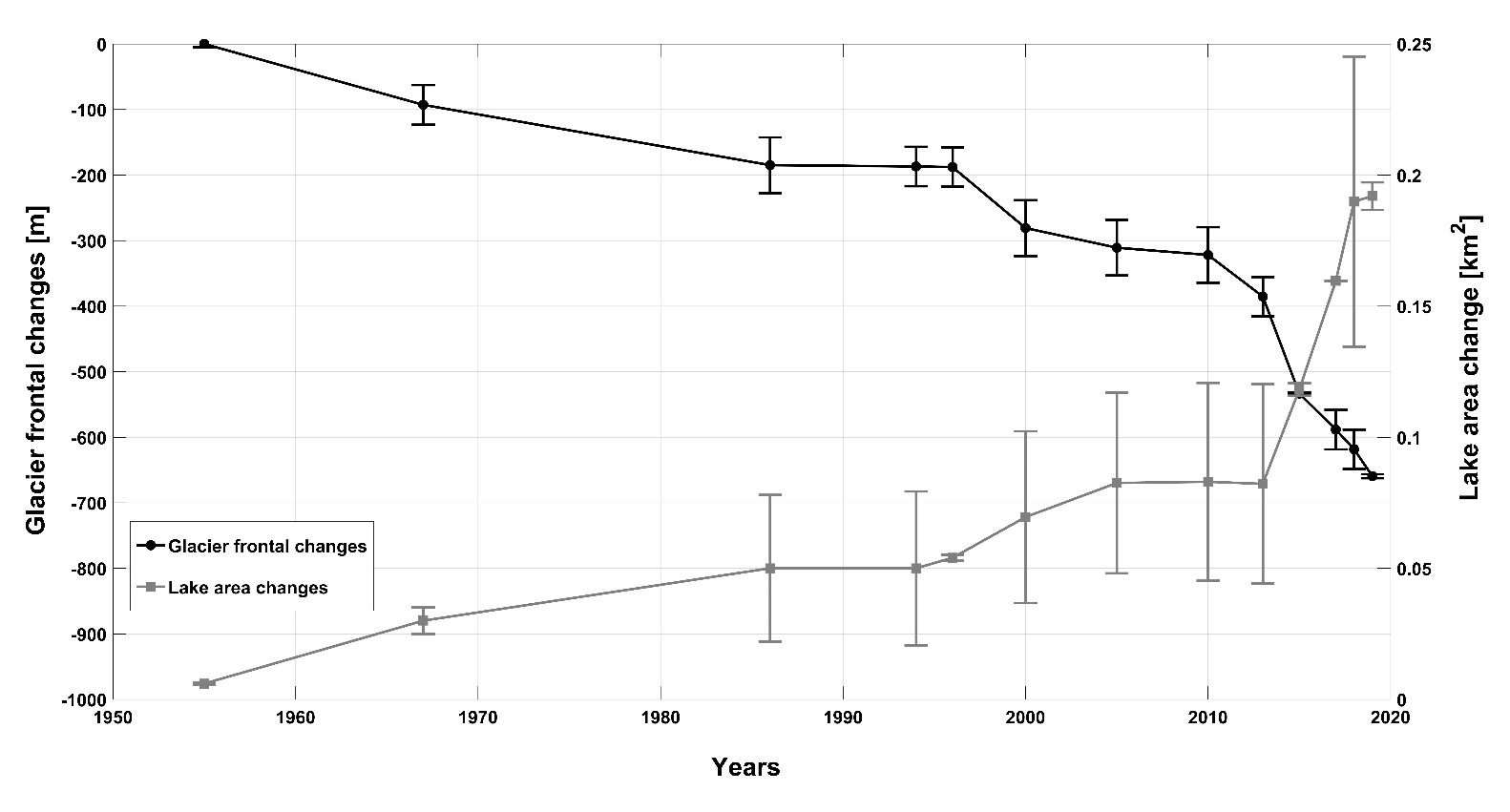
**Figure S2.** Time series of the observed (AWS1), estimated (CR2MET) and corrected daily air temperature at the location of the AWS1.

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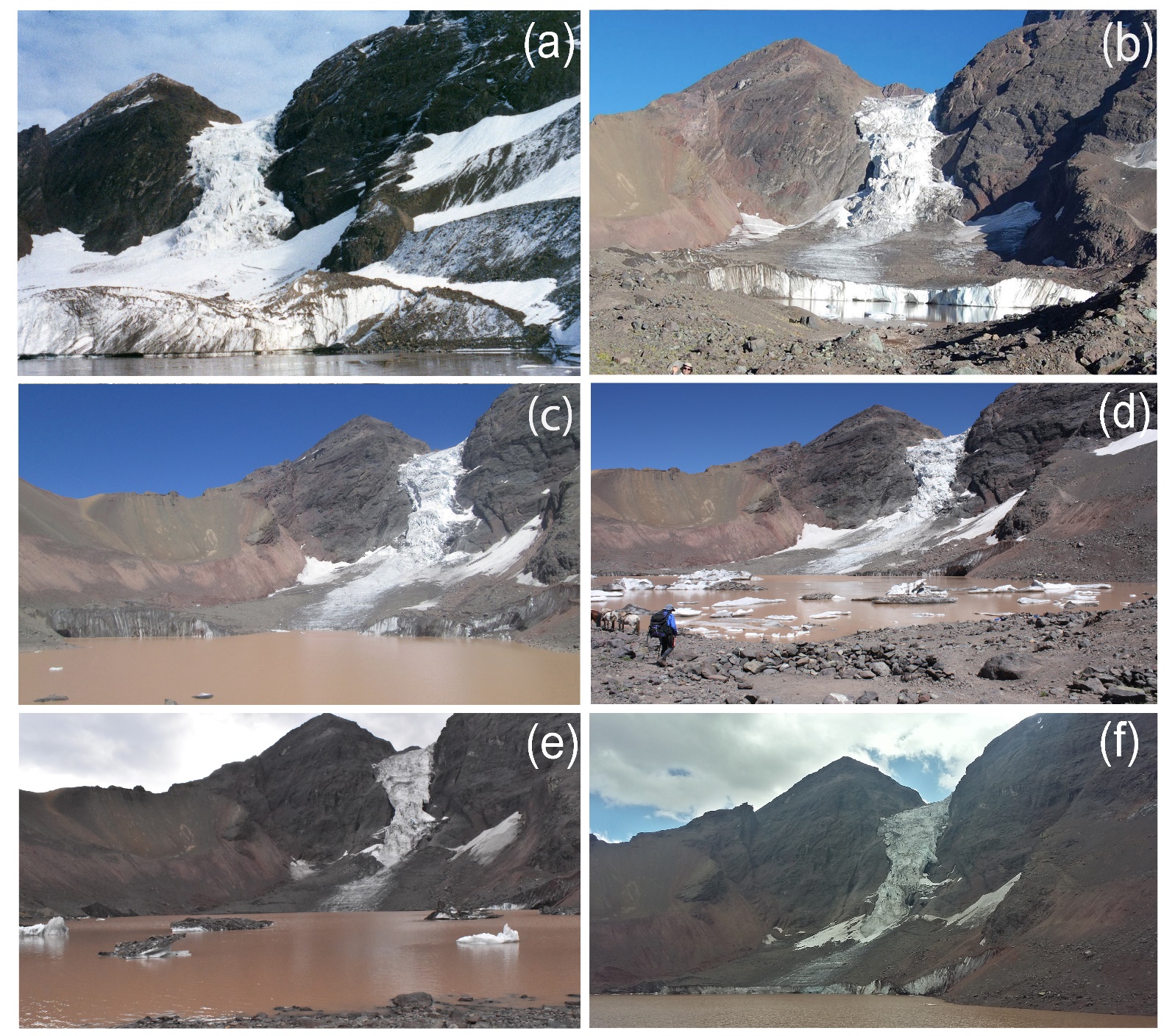
**Figure S3.** Daily air temperature time series from observations at AWS2 and estimation after correction using CR2MET data at the same location.

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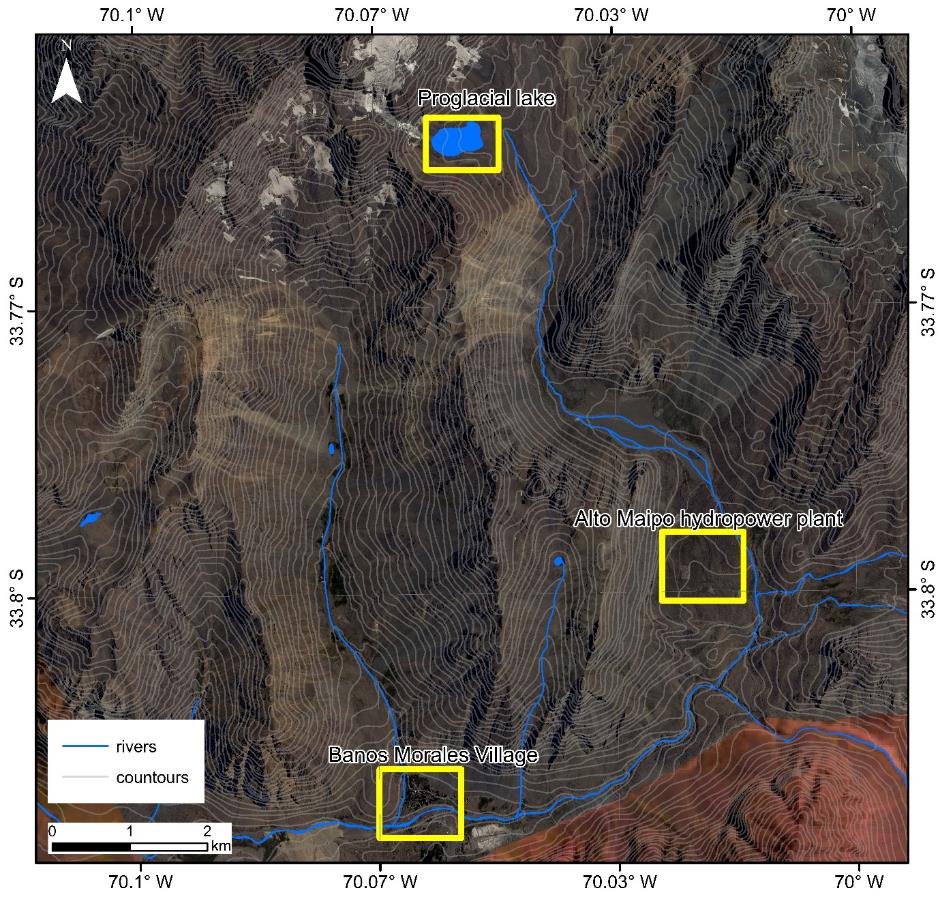
**Figure S4.** CR2MET annual precipitation anomalies during the 1979-2015 period at the location of the El Morado Glacier (EMG)

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**Figure S5.**  Comparison between glacier frontal changes and proglacial lake changes.

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**Figure S6.** Photographs of El Morado Glacier front and proglacial lake between 2003 and 2009. (a) Corresponds 2003, (b) 2009 (Photo: Guillermo Azocar), (c) 2015, (d) 2017, (e) 2018, (f) 2019.

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**Figure S7.** Location of the study area (Proglacial lake), Baños Morales village and hydropower infrastructure. Background: SPOT 6 satellite image (2015).