Supplement of

On the selection of precipitation products for the regionalisation of hydrological model parameters

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Figure S1: Rain gauges that each merged product used to construct their $P$ estimates over Chile.
Figure S2: Comparison of $P$ products over 2000–2014 (near-normal): $a$) mean annual $P$ for each product resampled to a 0.05° spatial resolution using the nearest neighbour method. The dark red horizontal lines represent the limits of each major macroclimatic zone; and $b$) mean monthly $P$ averaged over each catchment located within each macroclimatic zone (see Figure 1).

Figure S3: Comparison of $P$ products over 1990–1999 (near-normal): $a$) mean annual $P$ for each product resampled to a 0.05° spatial resolution using the nearest neighbour method. The dark red horizontal lines represent the limits of each major macroclimatic zone; and $b$) mean monthly $P$ averaged over each catchment located within each macroclimatic zone (see Figure 1).
Figure S4: Comparison of $P$ products over 2015–2018 (dry): a) mean annual $P$ for each product resampled to a 0.05° spatial resolution using the nearest neighbour method. The dark red horizontal lines represent the limits of each major macroclimatic zone; and b) mean monthly $P$ averaged over each catchment located within each macroclimatic zone (see Figure 1).
Figure S5: Median annual values of four Climdex indices over 2000–2014 (near-normal): a) number of consecutive dry days (CDD); b) number of consecutive wet days (CWD); c) maximum $P$ over five consecutive days (RX5day); and d) annual $P$ that is above the 95th percentile of $P$ accumulated for events that are above the 95th percentile of the daily $P$ for wet days (R95pTOT). The dark red horizontal lines represent the limits of each macroclimatic zone.
Figure S6: Median annual values of four Climdex indices over 1990–1999 (near-normal): 

- a) number of consecutive dry days (CDD);
- b) number of consecutive wet days (CWD);
- c) maximum $P$ over five consecutive days (RX5day); and
- d) annual $P$ that is above the 95th percentile of $P$ accumulated for events that are above the 95th percentile of the daily $P$ for wet days (R95pTOT). The dark red horizontal lines represent the limits of each macroclimatic zone.
Figure S7: Median annual values of four Climdex indices over 2015–2018 (dry): a) number of consecutive dry days (CDD); b) number of consecutive wet days (CWD); c) maximum $P$ over five consecutive days (RX5day); and d) annual $P$ that is above the 95th percentile of $P$ accumulated for events that are above the 95th percentile of the daily $P$ for wet days (R95pTOT). The dark red horizontal lines represent the limits of each macroclimatic zone.
Figure S8: Model parameters obtained through calibration of the 100 selected catchments. The vertical blue lines indicate the upper and lower limits of the parameter ranges.
Figure S9: Performance of regionalisation methods for Verification 1 (1990–1999) according to the hydrological regime: a) snow-dominated; b) nivo-pluvial; c) pluvio-nival; and d) rain-dominated. N denotes the number of catchments per hydrological regime.
Figure S10: Performance of regionalisation methods for Verification 2 (2015–2018) according to the hydrological regime: a) snow-dominated; b) nivo-pluvial; c) pluvio-nival; and d) rain-dominated. N denotes the number of catchments per hydrological regime.

Figure S11: Regionalisation performance of the P products over the 25 smallest catchments (area < 353.1 km²).
Figure S12: Model parameters obtained through calibration in snow-dominated catchments. The vertical blue lines indicate the upper and lower limits of the parameter ranges.

Figure S13: Model parameters obtained through calibration in pluvio-nival catchments. The vertical blue lines indicate the upper and lower limits of the parameter ranges.
Figure S14: Model parameters obtained through calibration in rain-dominated catchments. The vertical blue lines indicate the upper and lower limits of the parameter ranges.
Figure S15: Mean monthly water balance components over snow-dominated catchments, obtained by forcing the TUW model with different $P$ products for the: a) calibration (2000–2014); b) Verification 1 (1990–1999); and c) Verification 2 (2015–2018) periods. The mean monthly $P$ was added for comparison purposes.
Figure S16: Mean monthly water balance components over pluvio-nival catchments, obtained by forcing the TUW model with different $P$ products for the: a) calibration (2000–2014); b) Verification 1 (1990–1999); and c) Verification 2 (2015–2018) periods. The mean monthly $P$ was added for comparison purposes.
Figure S17: Mean monthly water balance components over rain-dominated catchments, obtained by forcing the TUW model with different $P$ products for the: a) calibration (2000–2014); b) Verification 1 (1990–1999); and c) Verification 2 (2015–2018) periods. The mean monthly $P$ was added for comparison purposes.