

Supplementary material	Caption
Figure S1	Series of figures showing examples of the GNSS time-series used to estimate the last three-year velocity field. Panels show the east, north, and vertical components (left columns) and the model residuals (right columns). The model (red lines) accounts for a linear rate, antenna offsets, earthquake offsets, postseismic decay and seasonal oscillations.
Figure S2	Principal and independent components for Transient No. 1, corresponding to synthetic data set with a transient with a duration of 150 days, that starts on the day 501 of the time series.
Figure S3	Detailed scheme of the method using as an example data set of Transient No. 1, corresponding to synthetic data set with a transient with a duration of 150 days, that starts on the day 501 of the time series. The scheme is divided in two parts, A and B, for better visualization of details.
Figure S4	Results for ICA-based method for synthetic data set No. 3. In (A), we plot the highest correlations ($H\rho$) for every independent component and every station. In (B), IC 2 and detrended time series IMCH, PECL and CONS are plotted (marked in (A)). The red lines correspond to the detected time window, while the green line is the onset time in the simulation. In (C), vectors of displacements in the detected time window are plotted.
Figure S5	Principal and independent components for Iquique dataset.