Supplementary materials for:

The surface displacement response of a tropical glacier to intra and inter annual forcing, Cordillera Blanca, Peru

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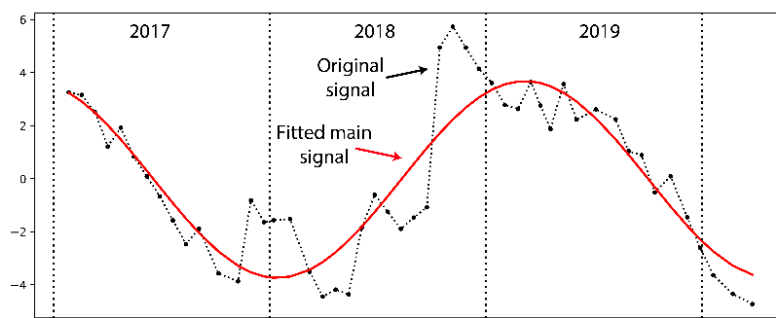
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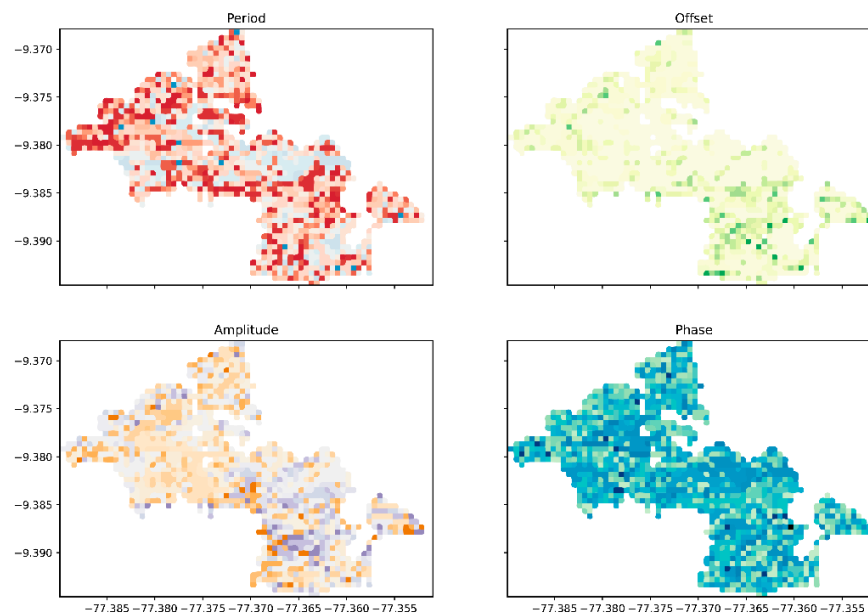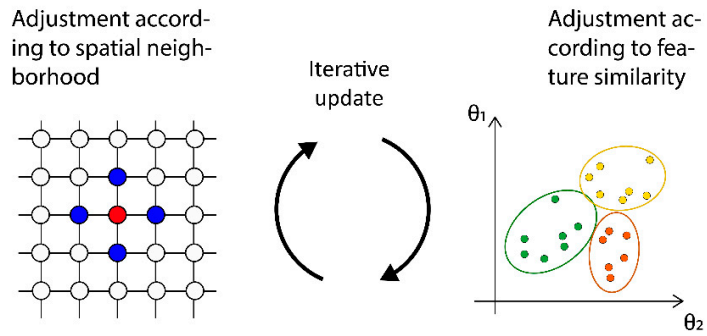
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Figures S1 to S10

(a)

(b)

(c)

Adjustment according to spatial neighborhood

Iterative update

Adjustment according to feature similarity
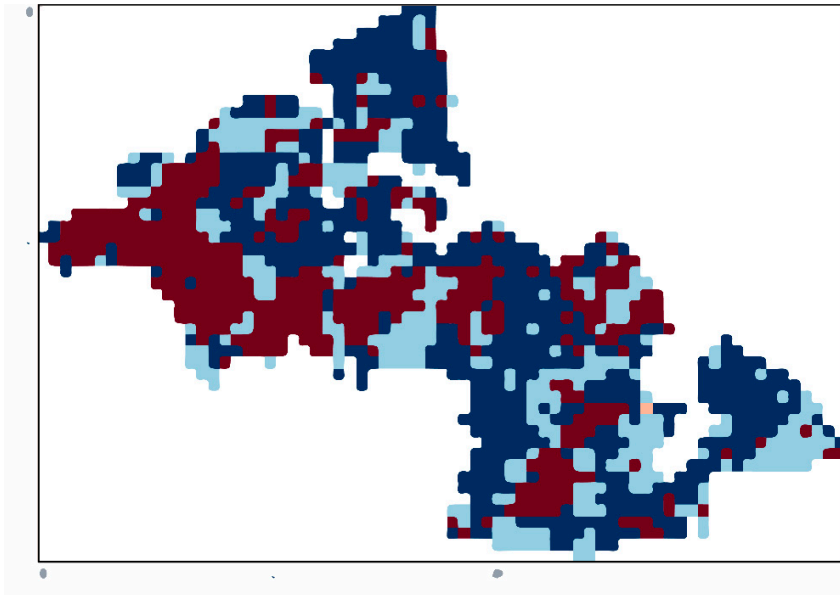
θ_1

θ_2

(d)

Figure S1: Conceptual representation of the clustering approach: **(a)** step 1, extraction of the dominant signal in the time series; **(b)** step 2, visualization of the spatial distribution of period, offset, amplitude and phase of the dominant signals; **(c)** step 3, schematic representation of the unsupervised machine learning algorithm (HNRF-GMM), combining spatial proximity and feature similarity in an iterative Bayesian approach; **(d)** step 4, spatial distribution of cluster results (see Fig. 7c in main text for results within a spatial context).
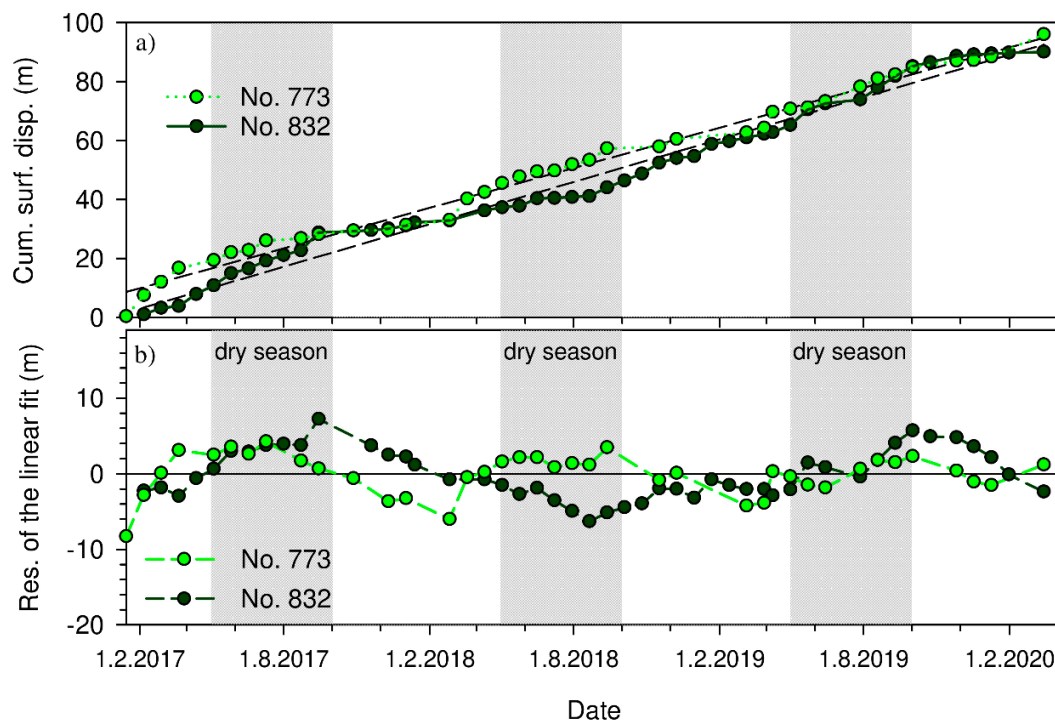
Figure S2: Displacement time series and residuals for selected points in Zone S3 (Figure 1, main text)
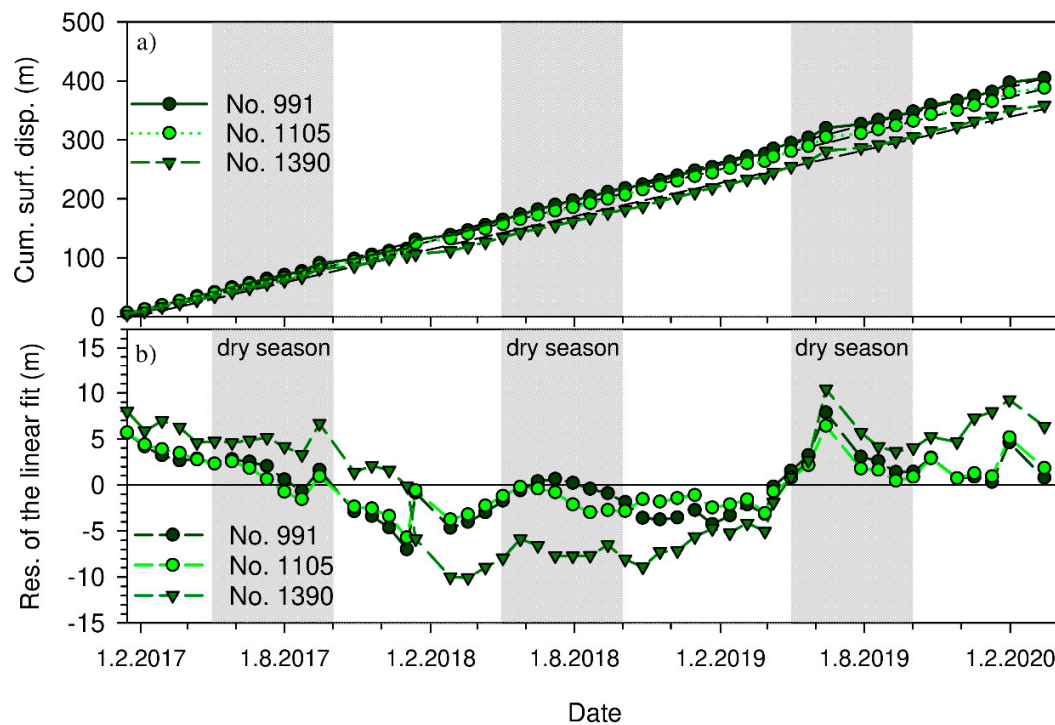

Figure S3: Displacement time series and residuals for selected points in Zone S4a (Figure 1, main text)
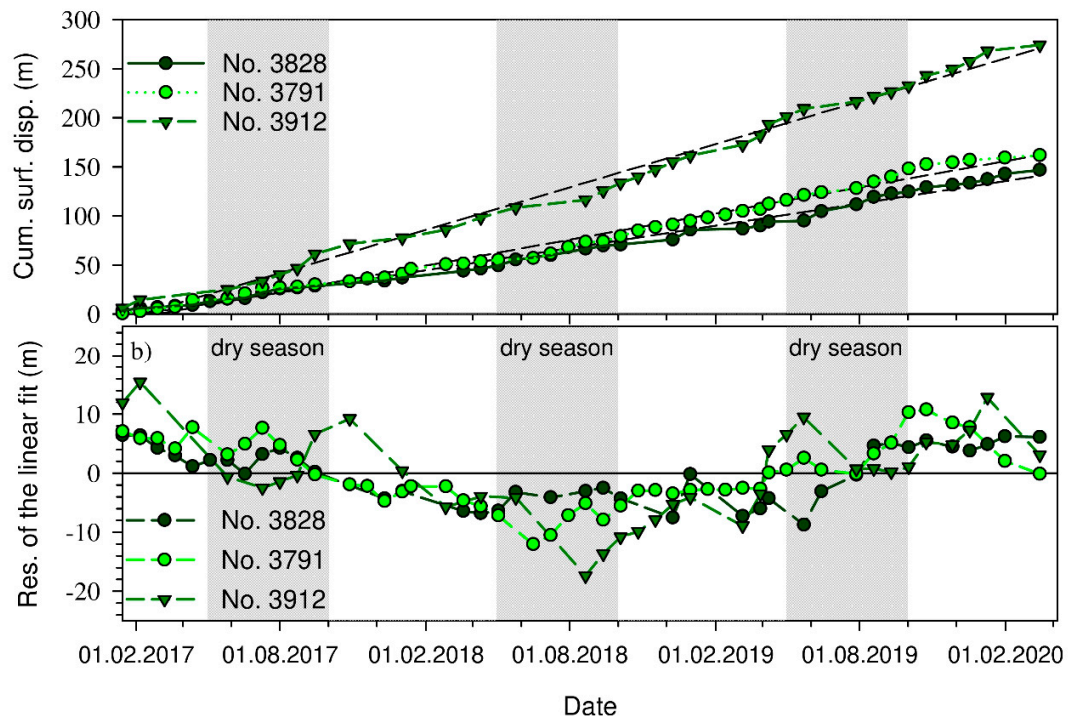
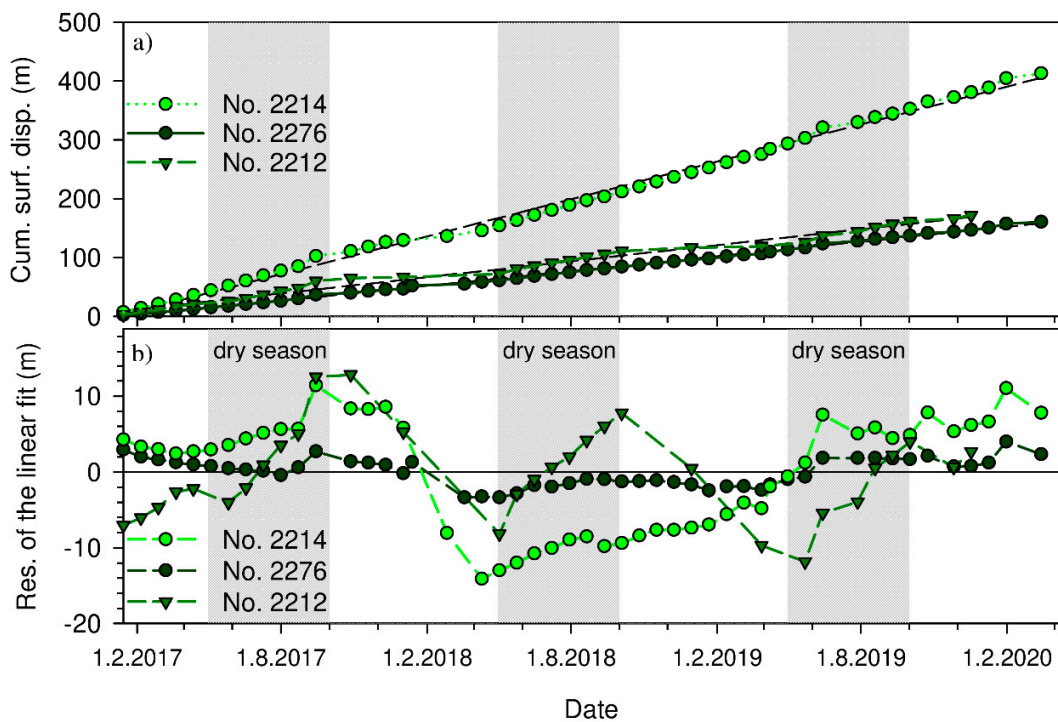Figure S4: Displacement time series and residuals for selected points in Zone E1 (Figure 1, main text)

Figure S5: Displacement time series and residuals for selected points in Zone E2 (Figure 1, main text)
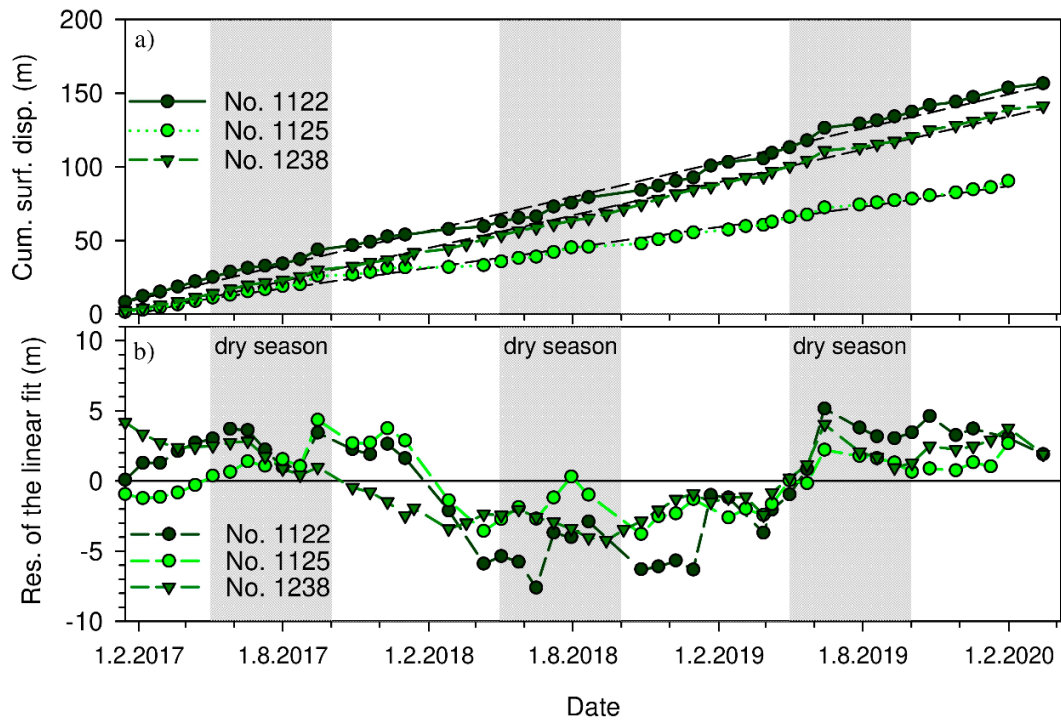
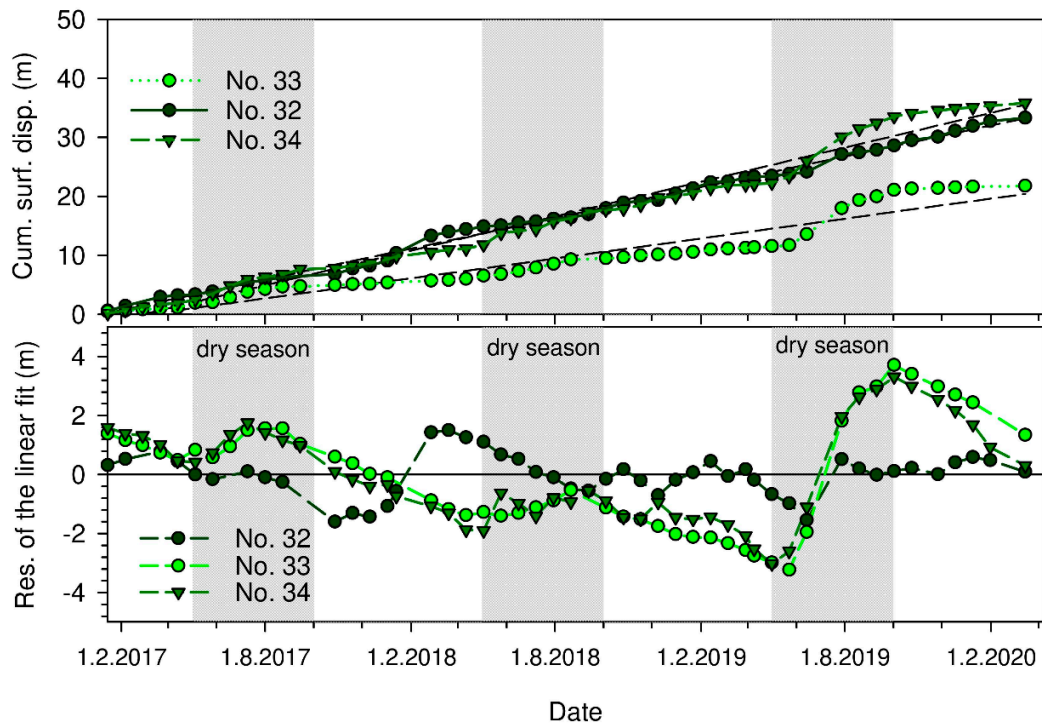Figure S6: Displacement time series and residuals for selected points in Zone S5 (Figure 1, main text)

Figure S7: Displacement time series and residuals for selected points in Zone S1 (Figure 1, main text)
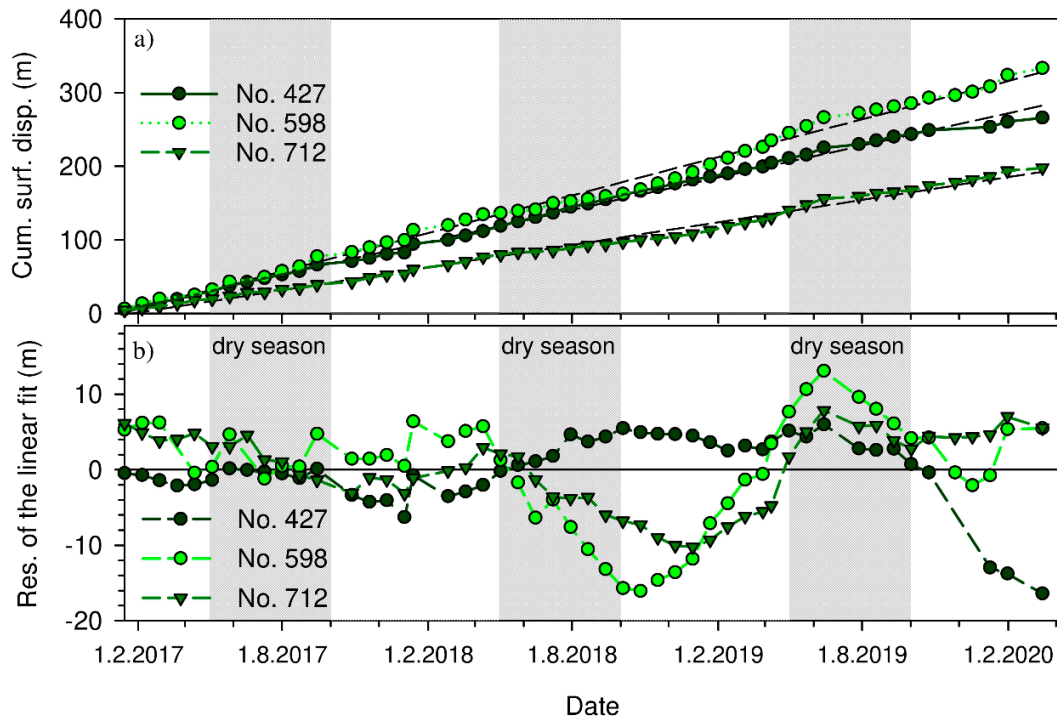
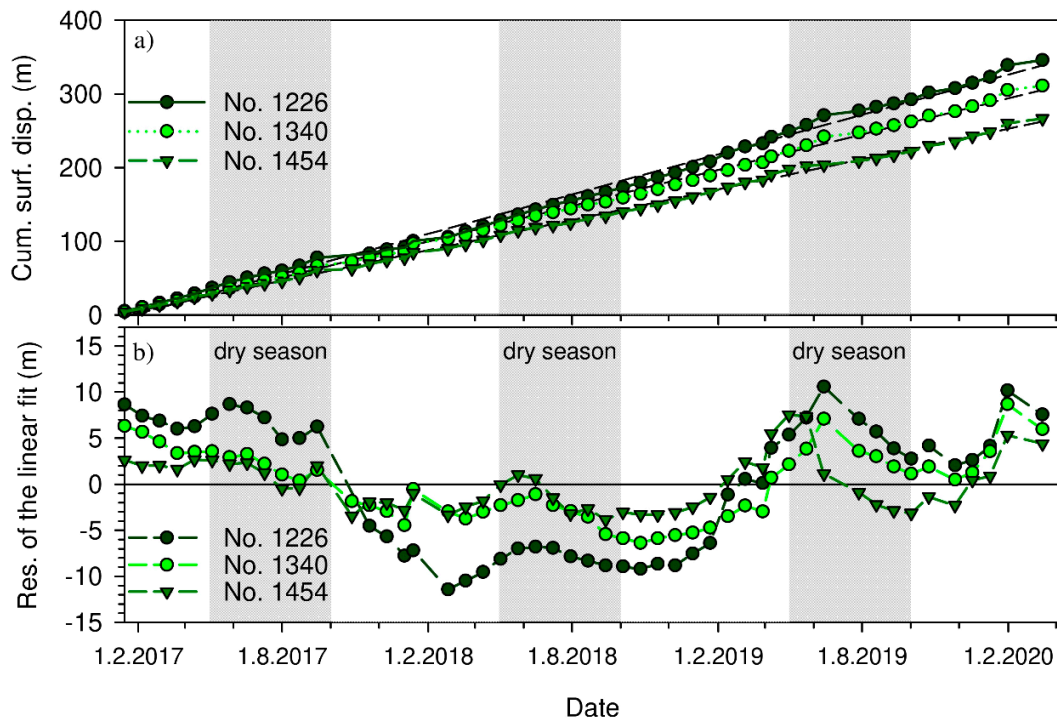Figure S8: Displacement time series and residuals for selected points in Zone S2 (Figure 1, main text)

Figure S9: Displacement time series and residuals for selected points in Zone S4b (Figure 1, main text)
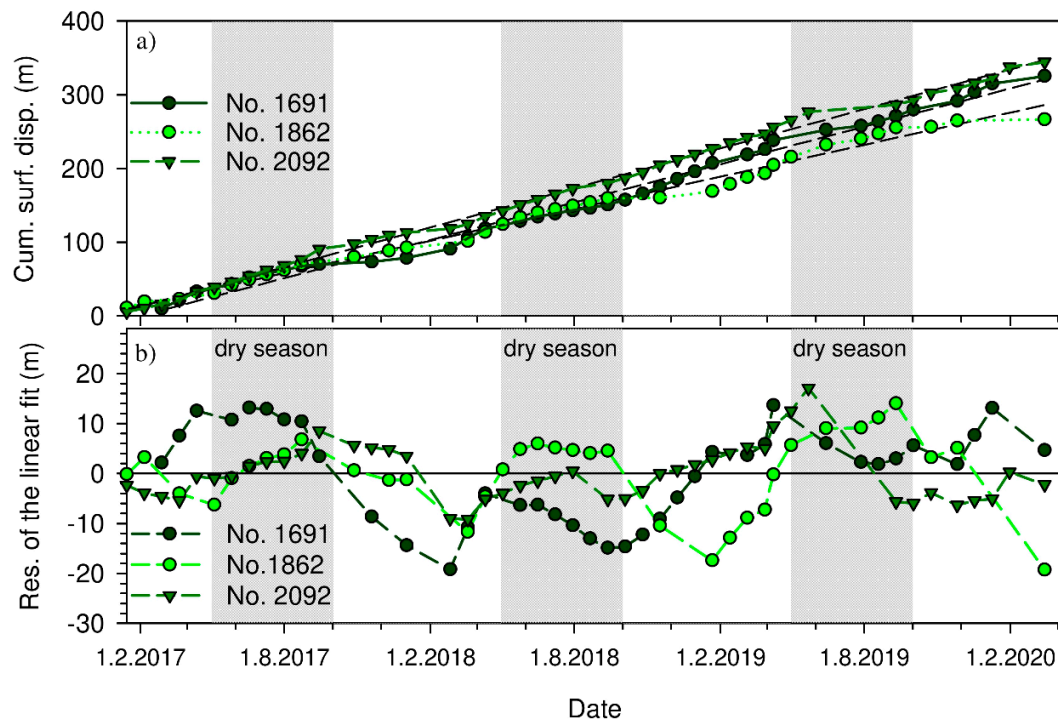
Figure S10: Displacement time series and residuals for selected points in Zone E3 (Figure 1, main text)