Supplemental Materials:

Basal Seismicity of the Northeast Greenland Ice Stream

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List of Figures

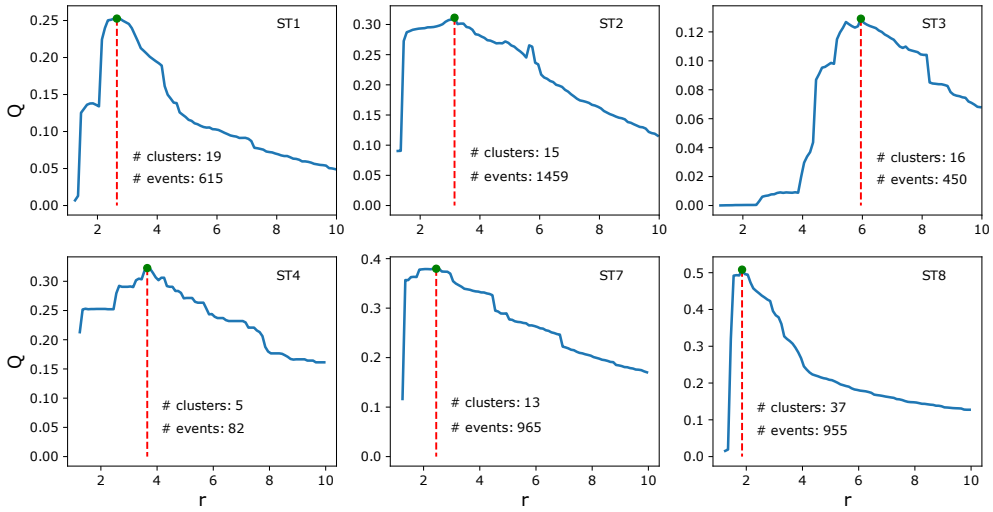

Figure S1: Modularity of MCL cluster results as a function of r, calculated separately for each station. Maximum values are marked by red line. Number of clusters obtained and total number of events assigned to repeating event families for each station are listed.

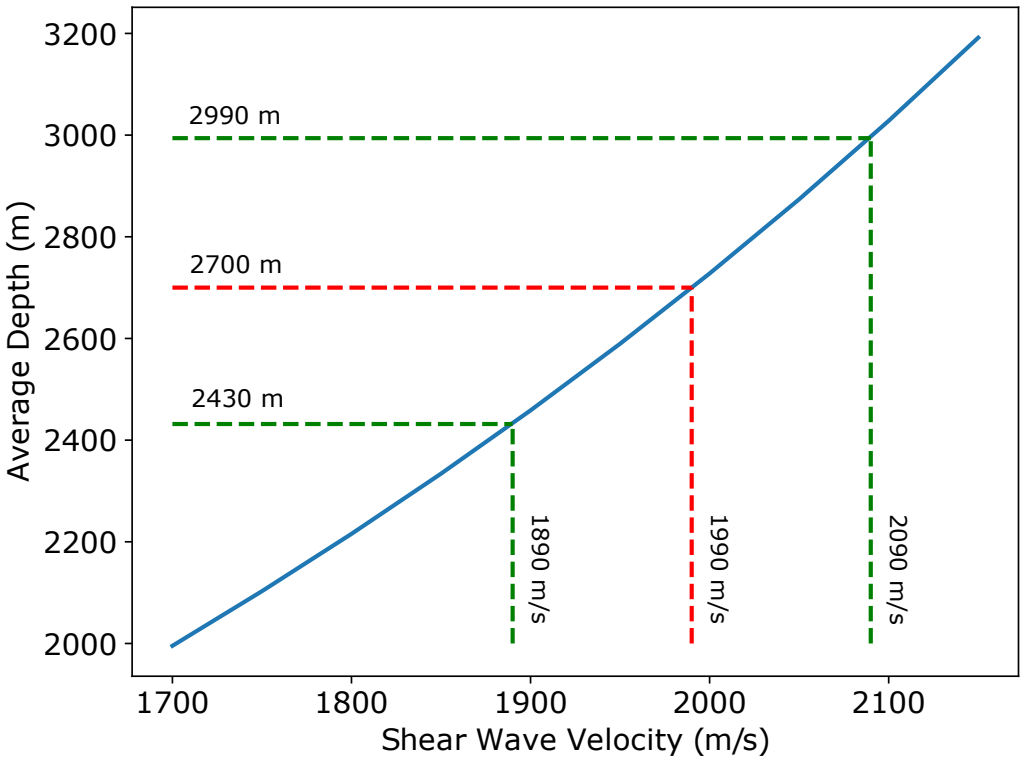

Figure S2: The mean depth of all 43 earthquake templates computed for V_p = 3,840 m/s and a range of S-wave velocity values. The average glacial bed depth of 2,700 m occurs at V_s = 1,990 m/s. For V_s =1,990 m/s $\pm$ 100 m/s, average depths vary between 2,430 m and 2,990 m.

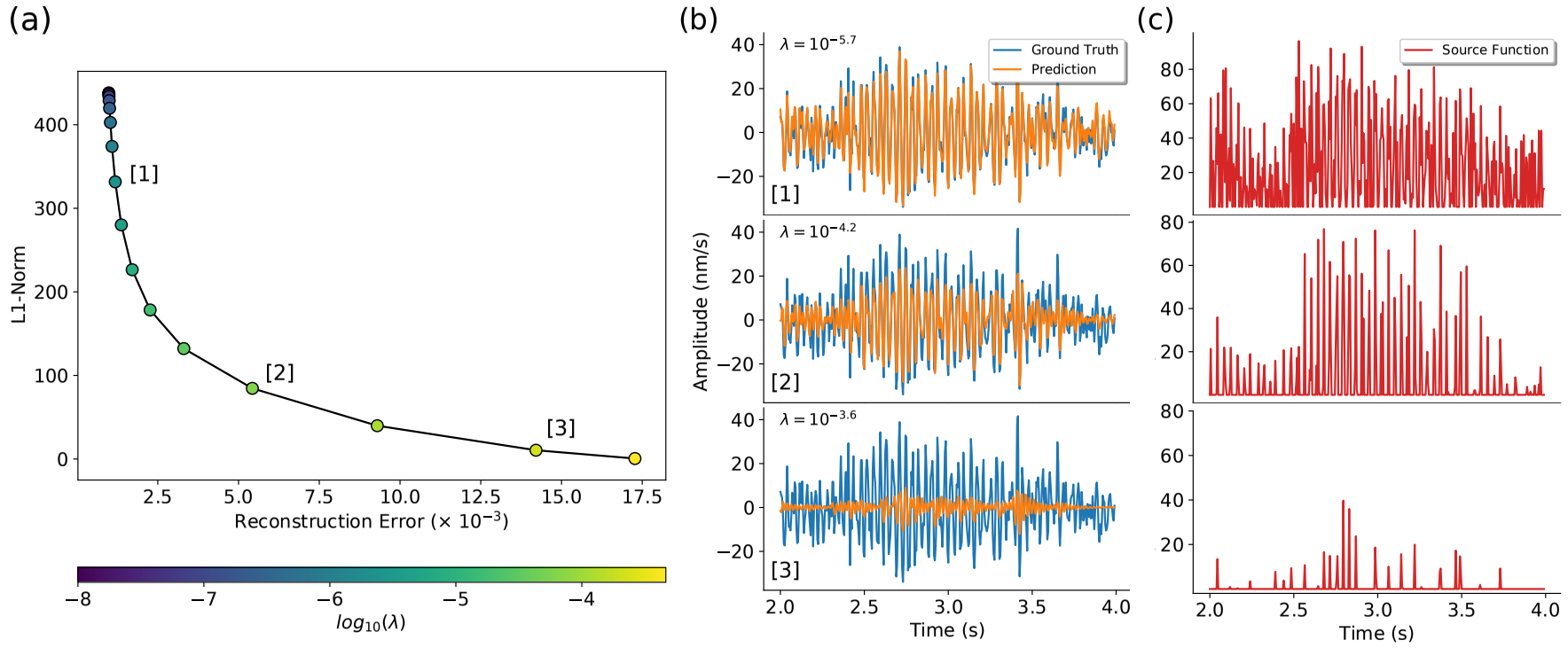

Figure S3: An analysis of the tremor inversion sensitivity to the L1-norm penalty weight, λ, in (Eq. 7). Results are shown for the tremor record example of Figure 12. (a) L1-norm of the solution ($\boldsymbol{s}$) and reconstruction error plotted as a function of λ. (b) Example reconstructions for three representative values of λ marked (1-3) in panel (a). (c) The resulting source time functions for each of three reconstruction examples shown in (b).

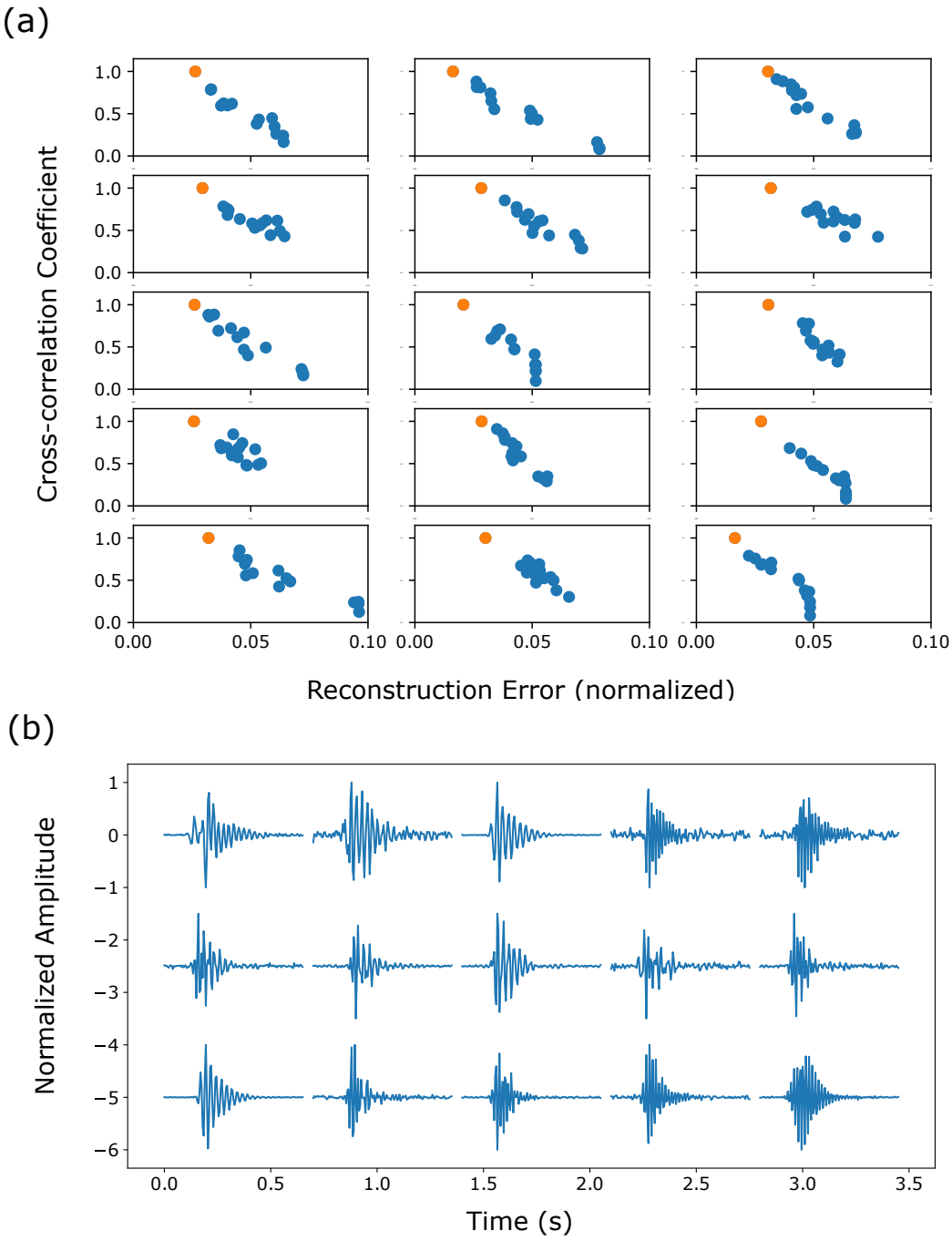

Figure S4: An analysis of the tremor inversion sensitivity to the choice of greens function, g. (a) For all 15 templates of station ST2 a random tremor record with ∼20 events/second and large b-values ($b \approx 8$) (implying many similarly sized sources) is generated and then inverted using all 15 templates. The resulting reconstruction error is plotted along with the cross-correlation coefficient between each template and the template that generated the tremor sequence. The template marked in orange is the correct template for that inversion, and in all cases this is also the template with the minimum reconstruction error. (b) HHN channel of all 15 template waveforms of station ST2. The top left template in panel (b) is the same template that optimally reconstructs the ∼1.2 hr tremor record from Figure 10(a) of the main text.

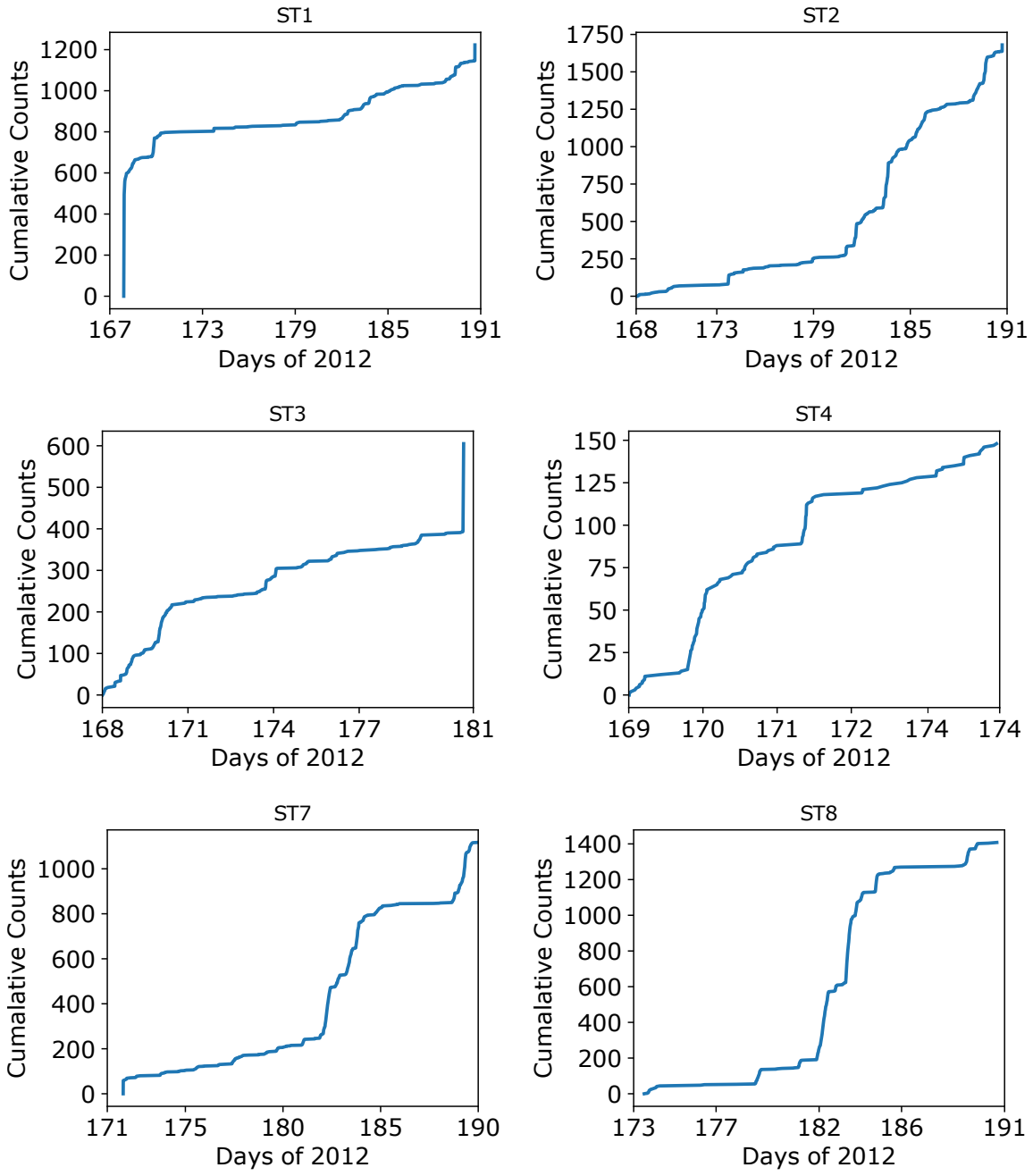

Figure S5: Cumulative counts of detected events for all stations over time.

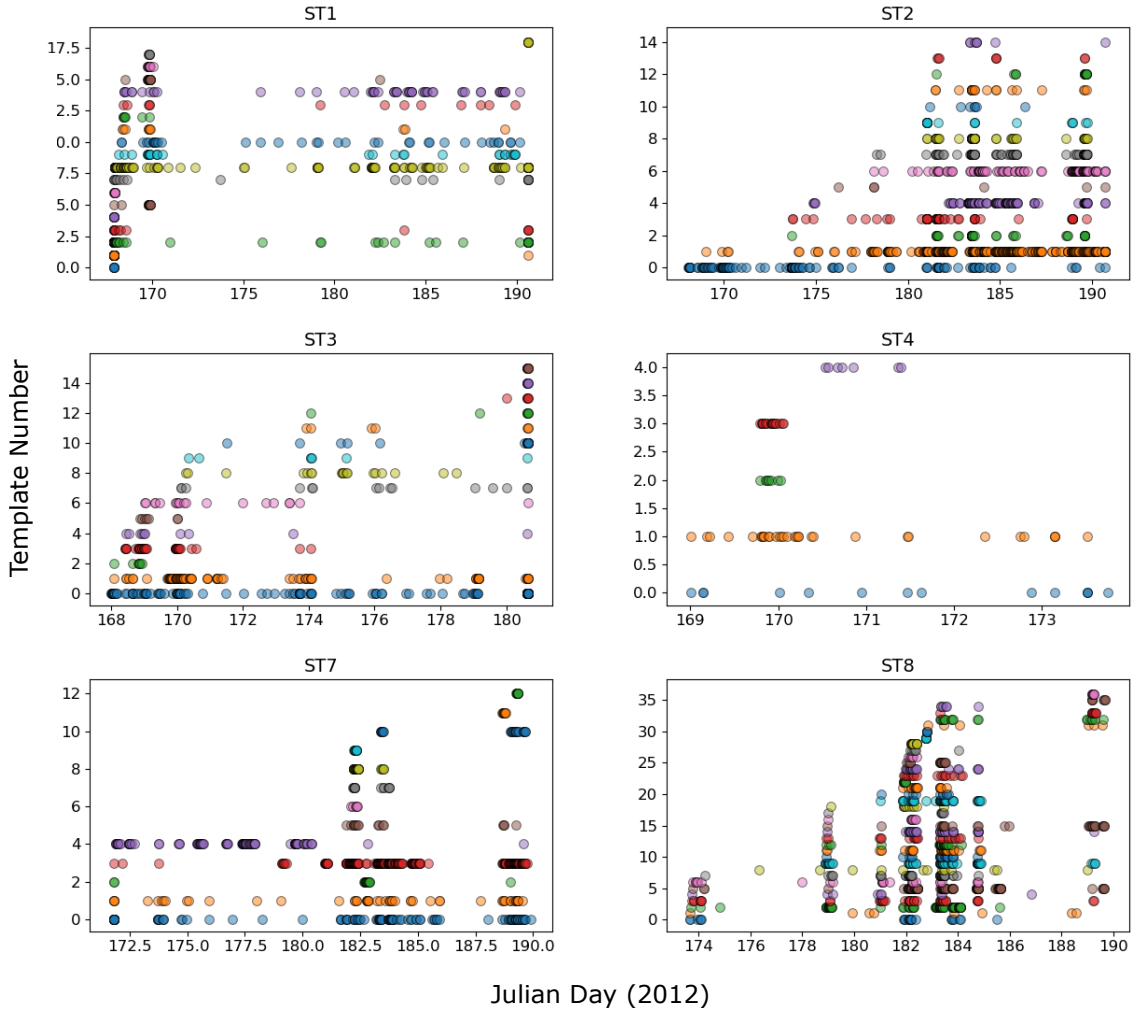

Figure S6: Event times of all earthquakes of each repeating group, for each station. Distinct event groups are color coded together and ordered by the first occurrence of an event in each group. Events are shown with a transparency value of 50%.