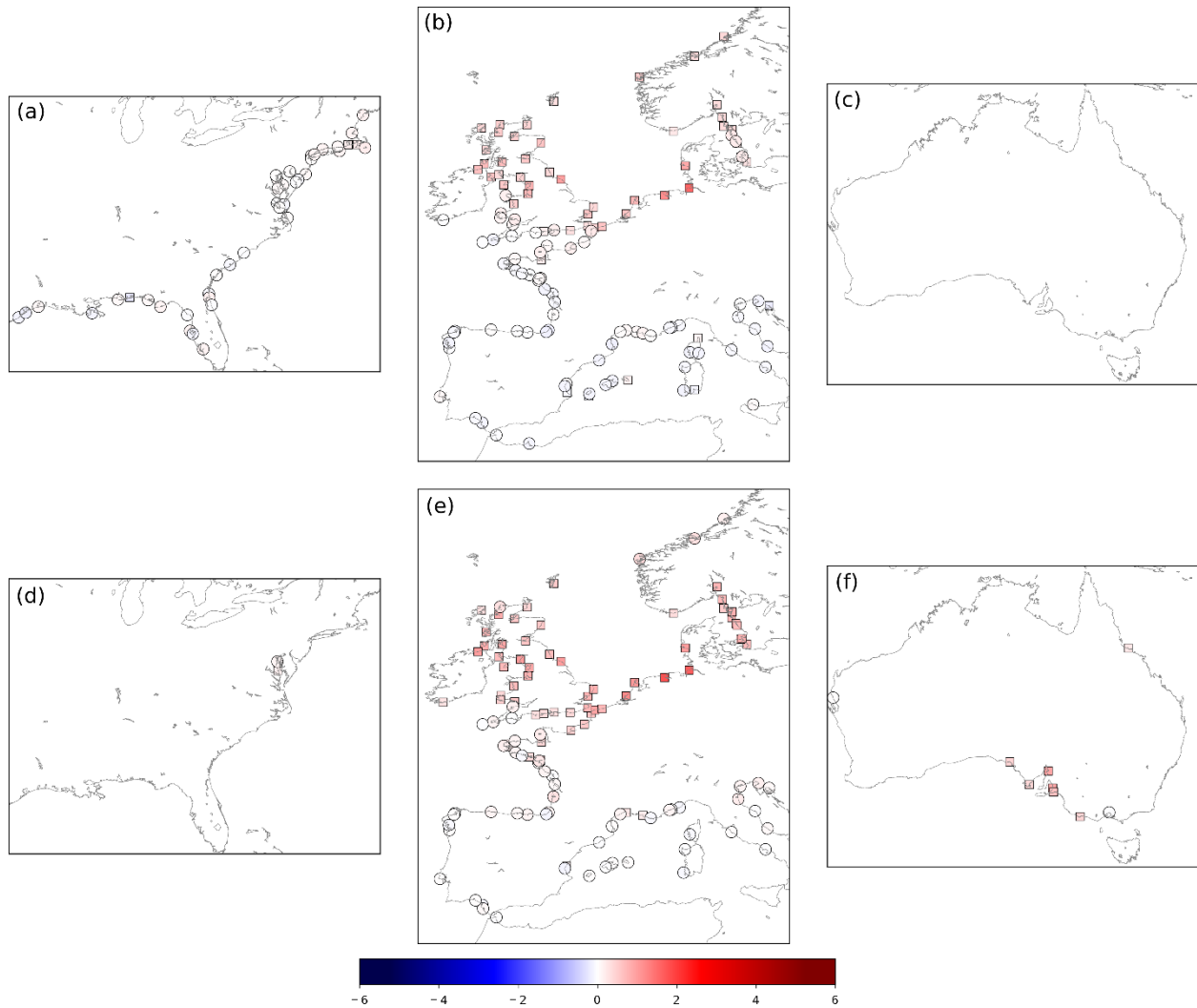
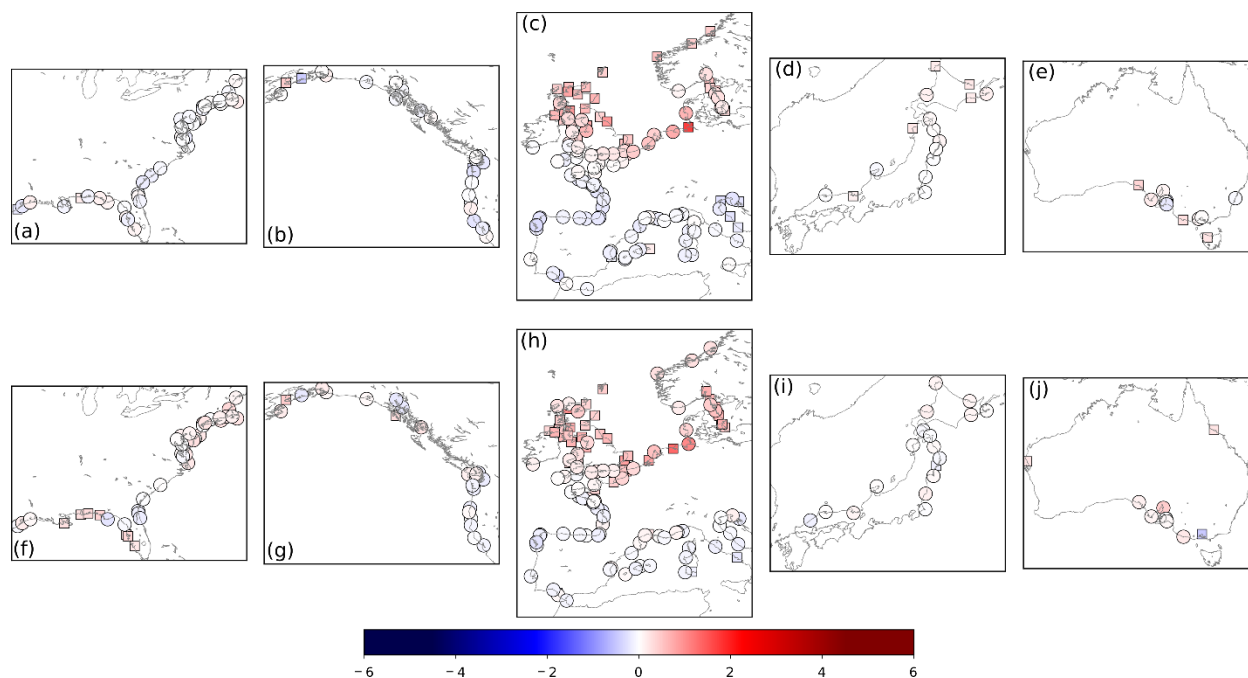


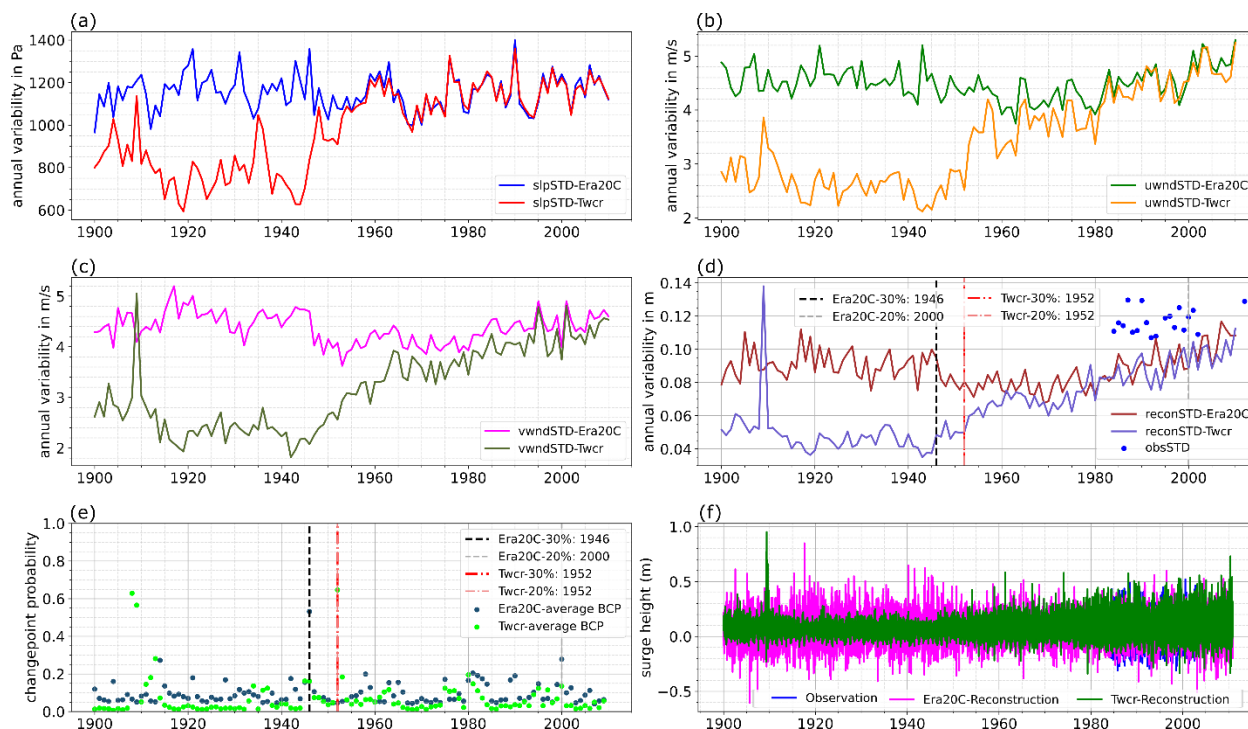
## Supplementary Figures



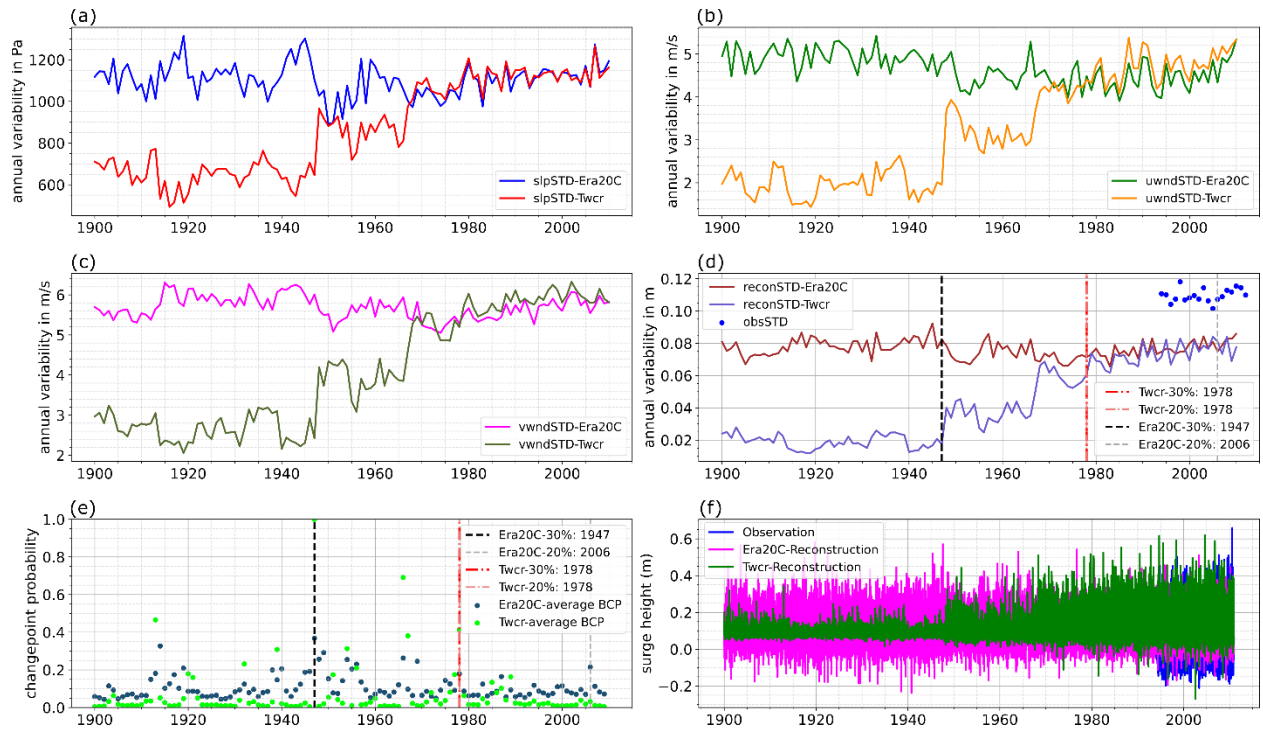
Supplementary Figure S1. Trends (mm/year) for the 95th percentile surges for G-20CR (a-c) and G-E20C (d-f) corresponding to the 1930-2015 and 1930-2010 respectively. Rectangle markers indicate significant trends at the 5% significance level.



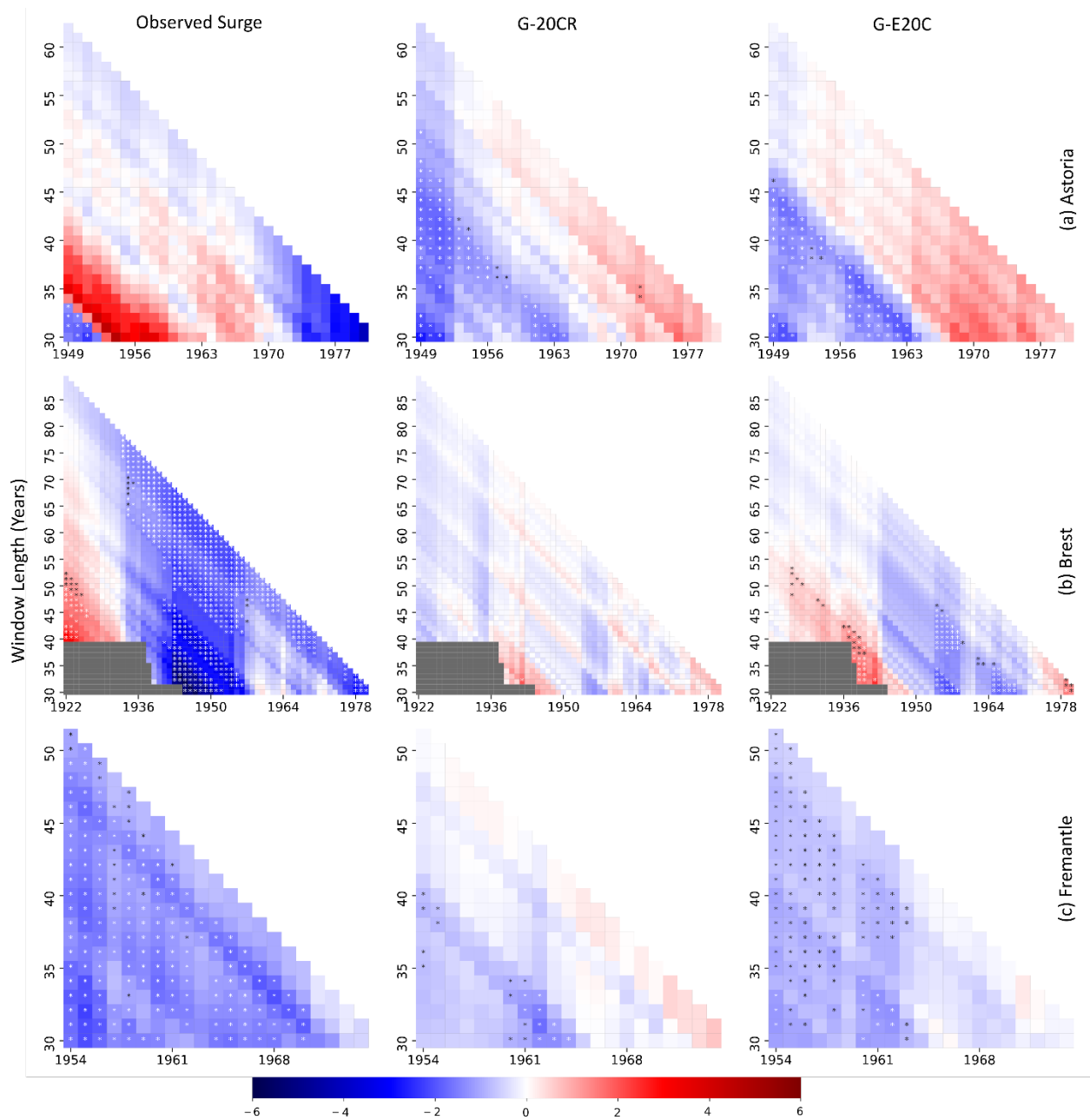
Supplementary Figure S2. Trends (mm/year) for the 95th percentile surges for G-20CR (a-e) and G-E20C (f-j) corresponding to 1950-2015 and 1950-2010 respectively. Rectangle markers indicate significant trends at the 5% significance level.



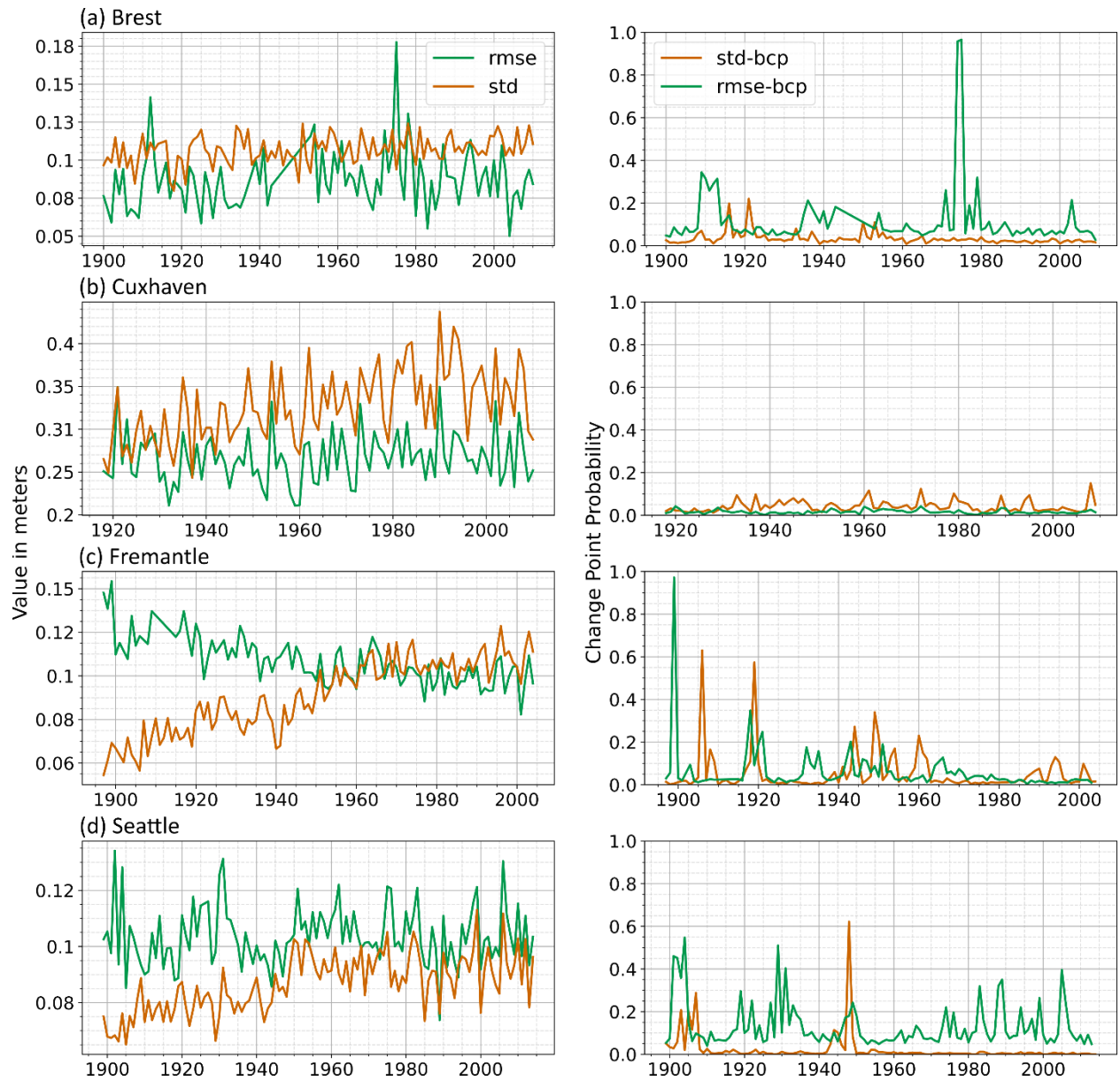
Supplementary Figure S3. Comparison of change point analysis for G-20CR and G-E20C for the 1900-2010 period for Antarctica Base Prat



Supplementary Figure S4. Comparison of change point analysis for G-20CR and G-E20C for the 1900-2010 period for Kerguelen Island



Supplementary Figure S5. Trends (mm/year) comparison for 99<sup>th</sup> percentile observed surge (left), G-20CR (middle), and G-E20C (right) for Astoria (a), Brest (b), and Fremantle (c). Trends are computed starting with a minimum window length of 30 years up to the length of available data. Significant trends at 5% significance level are marked with an asterisk. Grey rectangles indicate time period where data is not at least 75% complete.



Supplementary Figure S6. Annual RMSE (green) and Standard Deviation (std; orange) time series (left) and the corresponding change point probabilities (right) for selected tide gauges with long observational records.