# Supplementary Materials for

## Fluvial erosion linked to warming in the Arctic

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**This PDF file includes:**

Supplementary Text
Figs. S1 to S7

## Supplementary Text

Here we present additional figures referenced in the main text that support the conclusions drawn in our discussion.

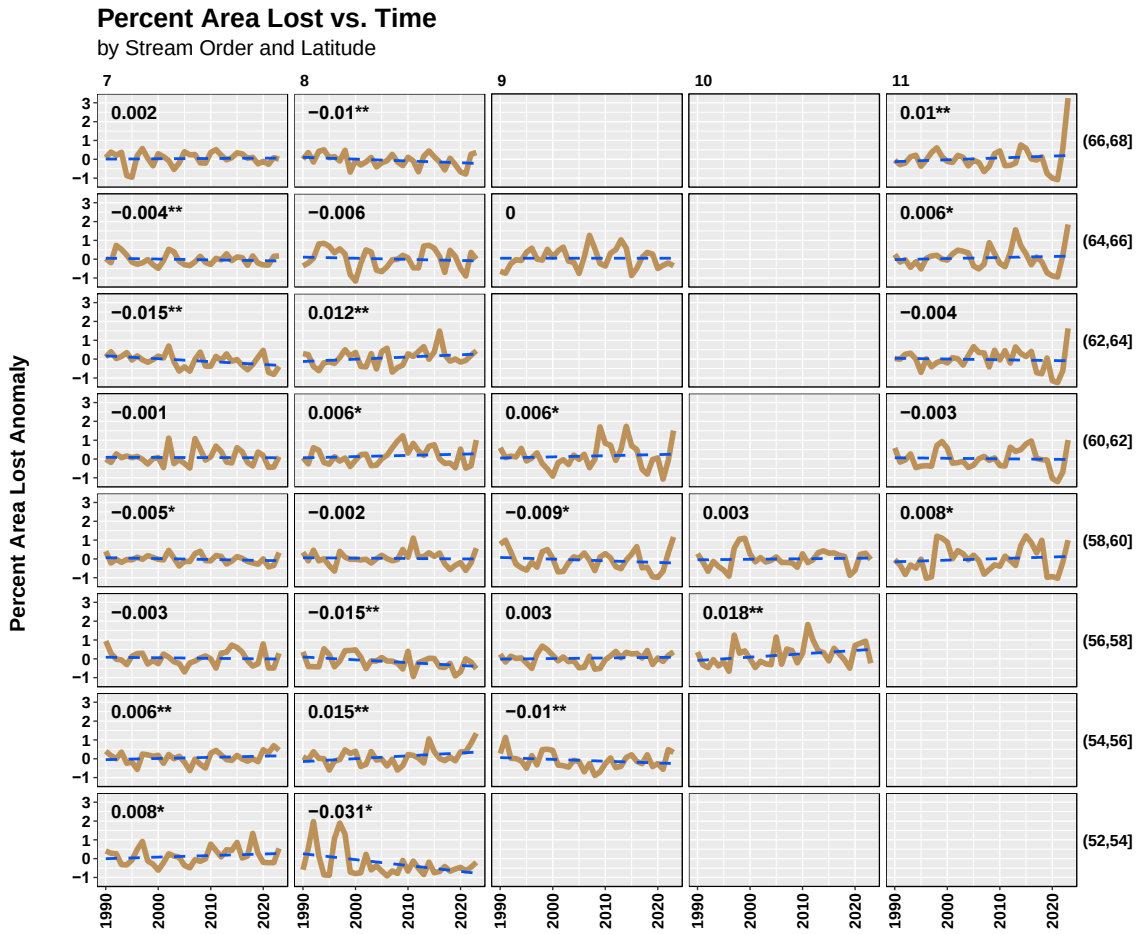


**Fig. S1: Erosion over time.** Percent Area Eroded Anomaly over time segmented by stream order and latitude with the slope of the linear fit (dashed blue line) printed in each panel. Note that most linear trendlines show little change over the whole record but that many sites show large positive anomalies in the later part of the record. A '*' indicates significance at the $p < 0.5$ level; '**' indicates significance at the $p < 0.001$ level.

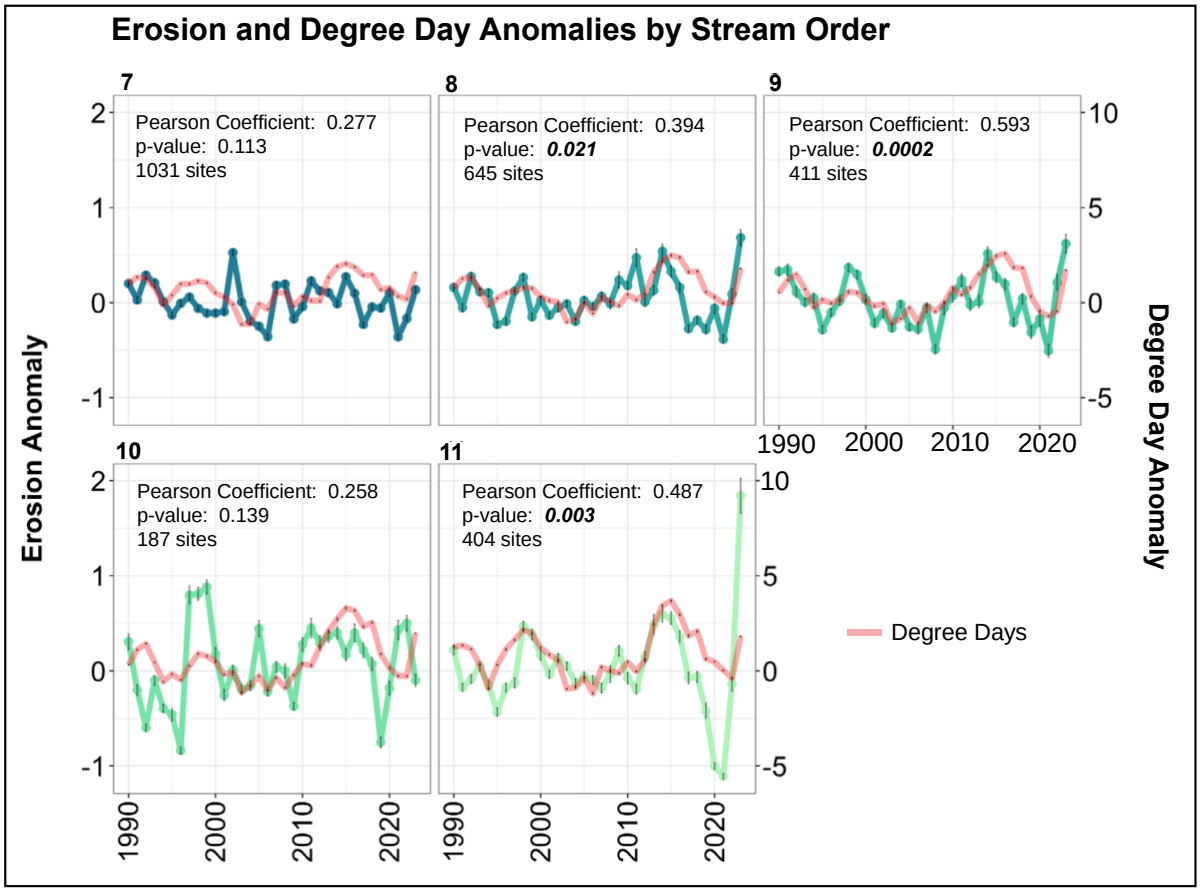


**Fig. S2: Erosion by stream order.** Percent Area Eroded Anomaly over time across all sites compared to degree day and discharge anomalies segmented by stream order. Correlation coefficients for erosion-degree days are shown in black. Error bars are the standard error of values across all study sites.

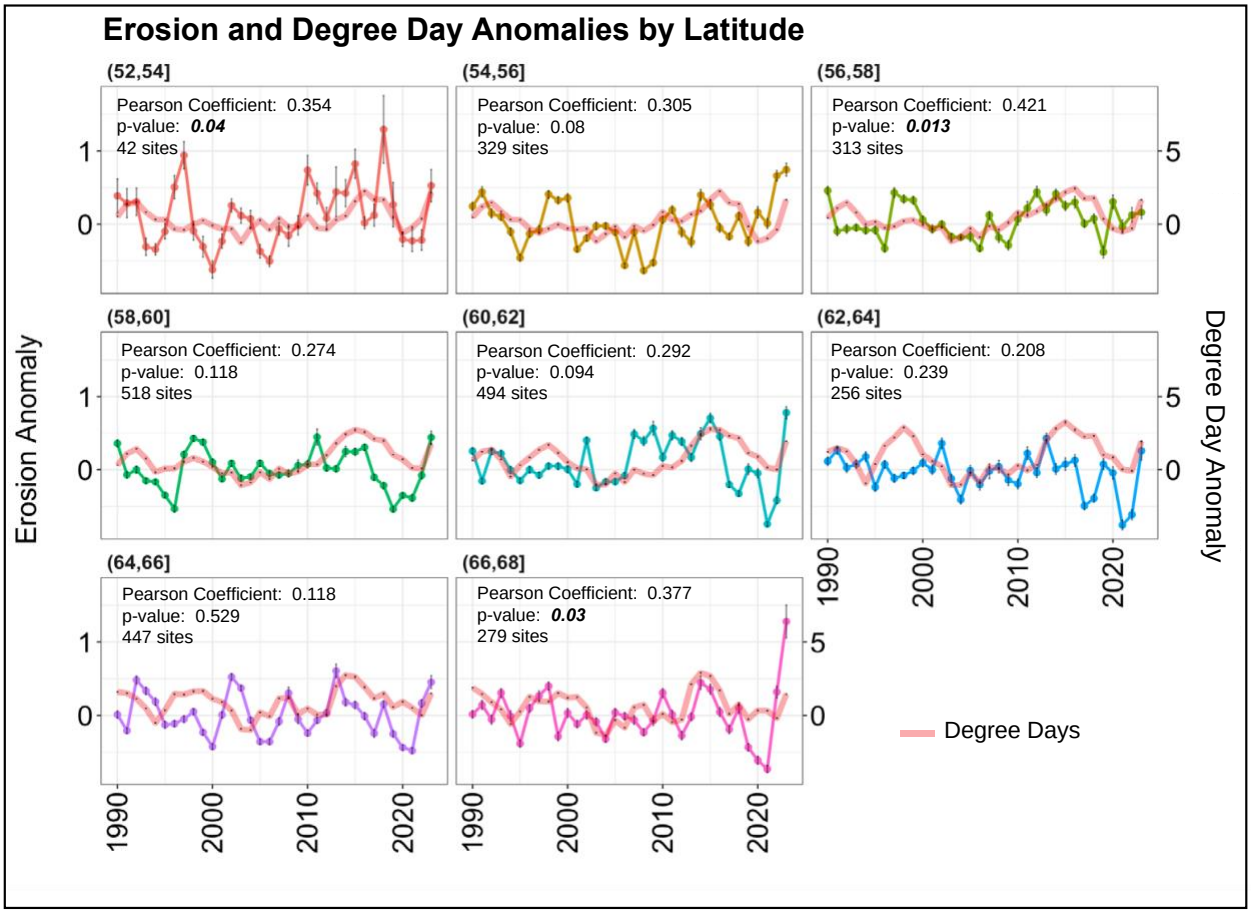


**Fig. S3: Erosion by Latitude.** Erosion Percent Area Eroded Anomaly over time across all sites compared to degree day and discharge anomalies segmented by latitude bin. Correlation coefficients for erosion-degree days are shown in black. Error bars are the standard error of values across all study sites.

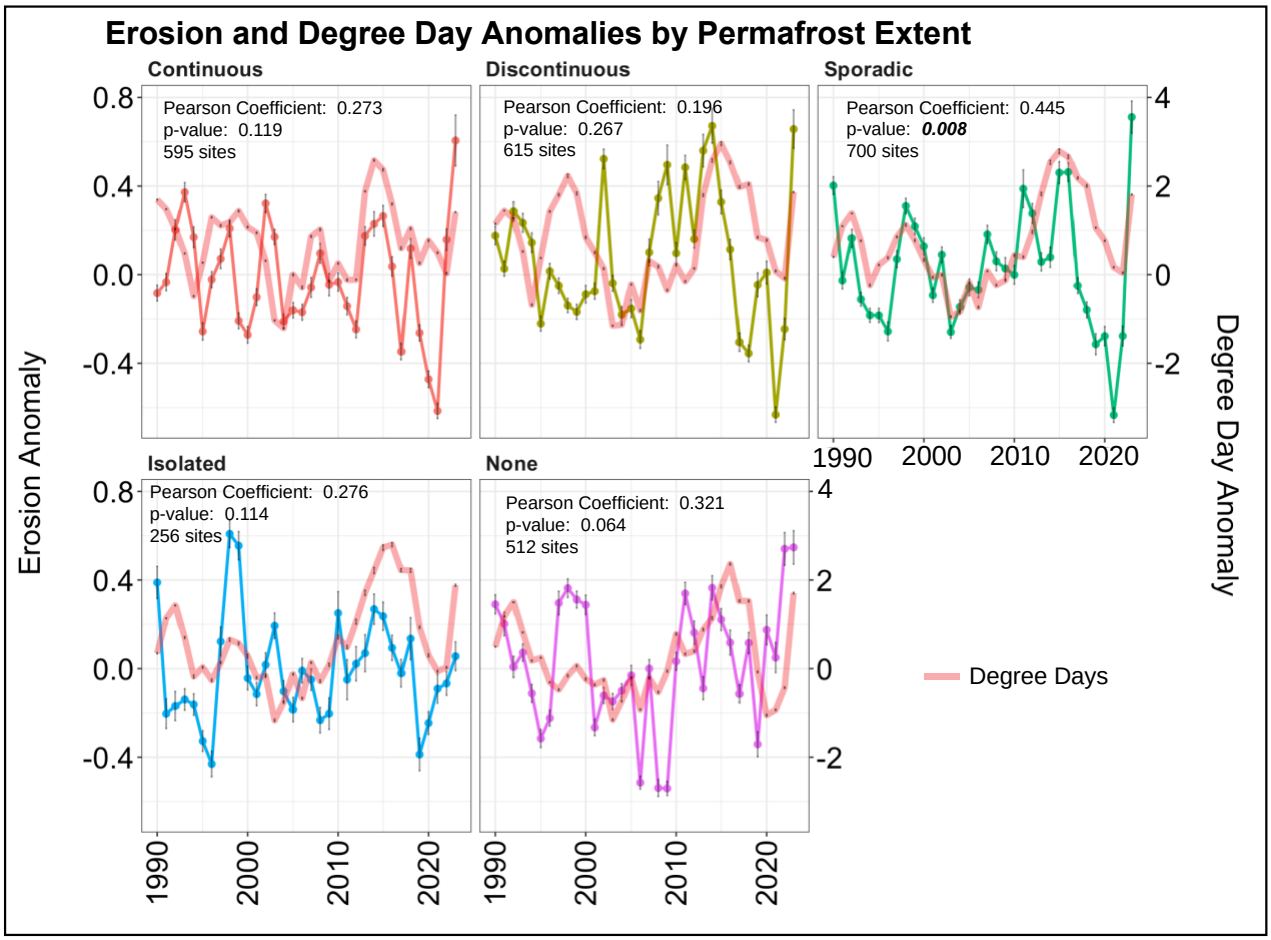


**Fig. S4: Erosion by Permafrost Extent.** Percent Area Eroded Anomaly over time across all sites compared to degree day and discharge anomalies segmented by permafrost extent (data sourced from the National Snow and Ice Data center, derived from Brown et al., 1997). Correlation coefficients for erosion-degree days are shown in black. Only the correlation for the sporadic class is significant, perhaps indicating this class is most susceptible to warming. Error bars are the standard error of values across all study sites.

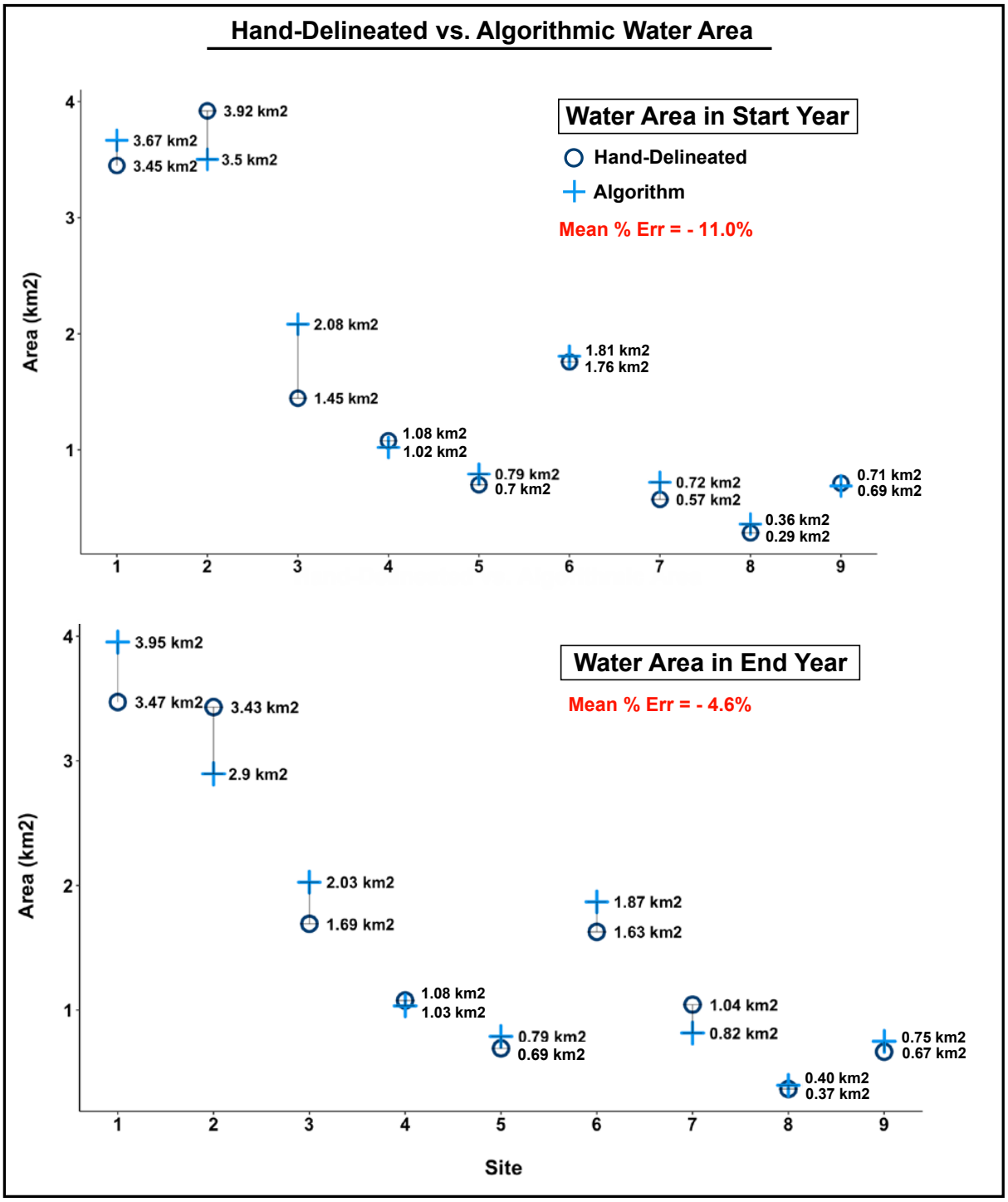


**Fig. S5: Validation of the water-detection algorithm.** Hand-delineated water area vs algorithmically-determined water in selected Thiessen polygons (study sites) in the start (top) and end (bottom) years of our 5-year windows. For ground truthing, all water in the polygon was traced in a Landsat image from one year and then again in an image of the same site five years later. Overall, errors are small.

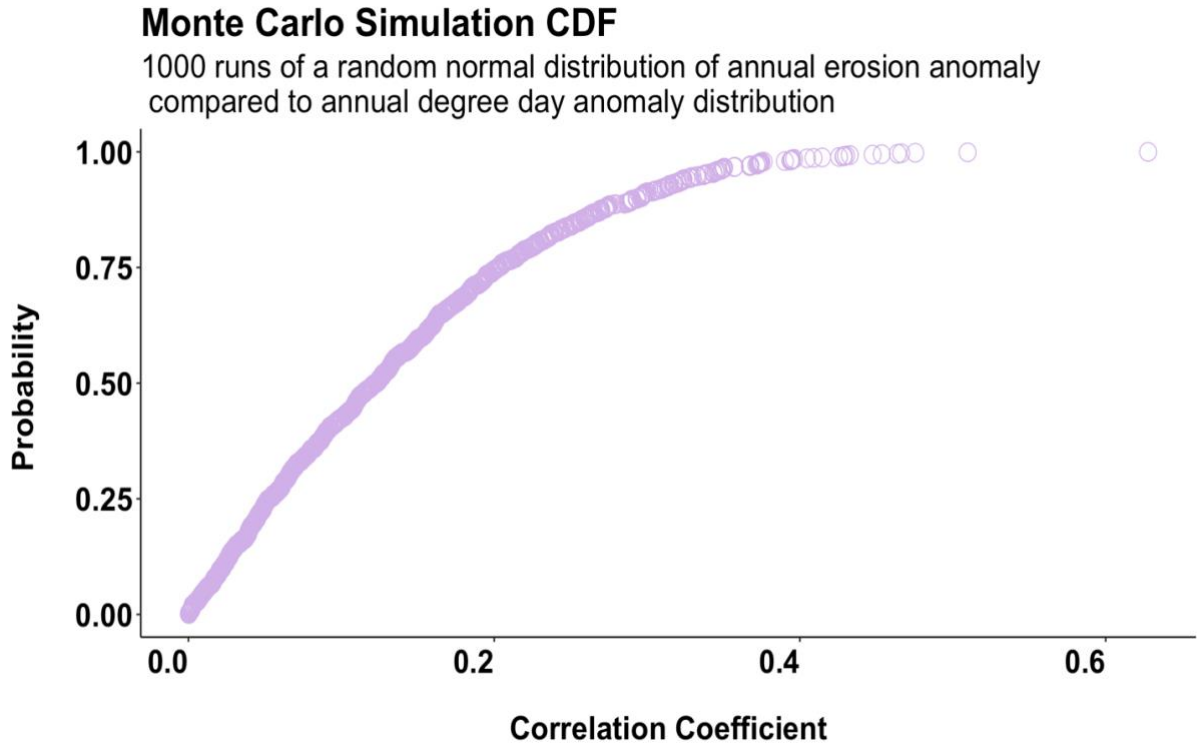


**Fig. S6: Monte Carlo Simulation.** A cumulative distribution of the correlation coefficients generated by the Monte Carlo simulation of one thousand runs of a random normal distribution of annual erosion anomaly compared to the annual degree day anomaly distribution.