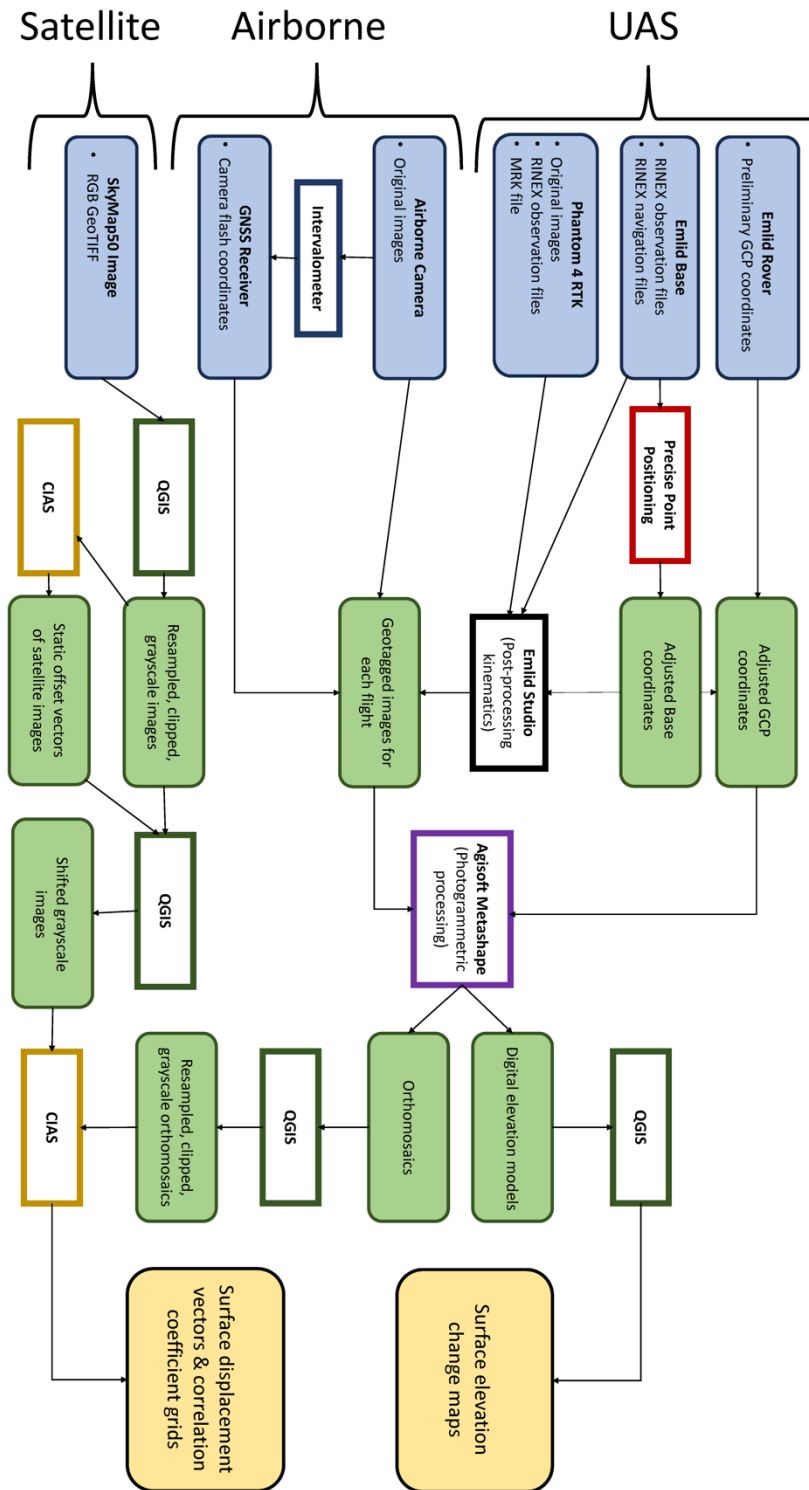
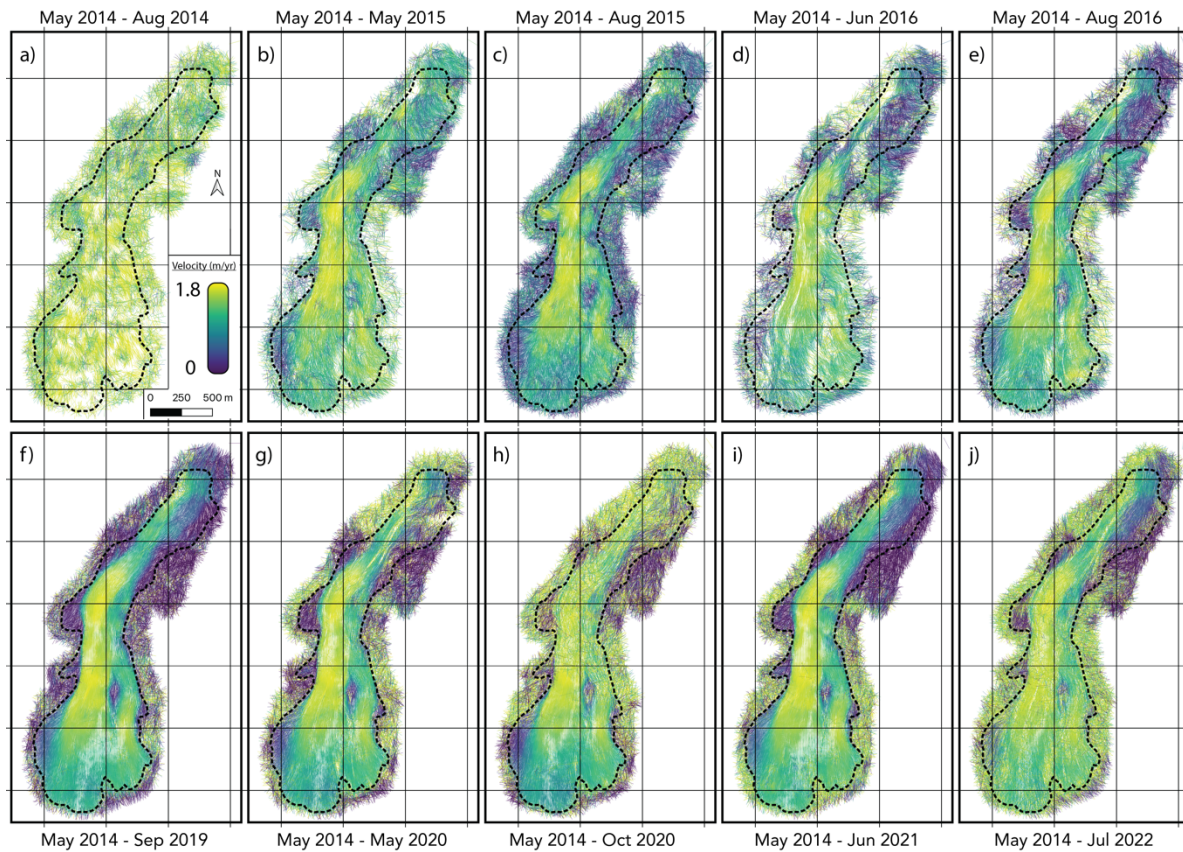


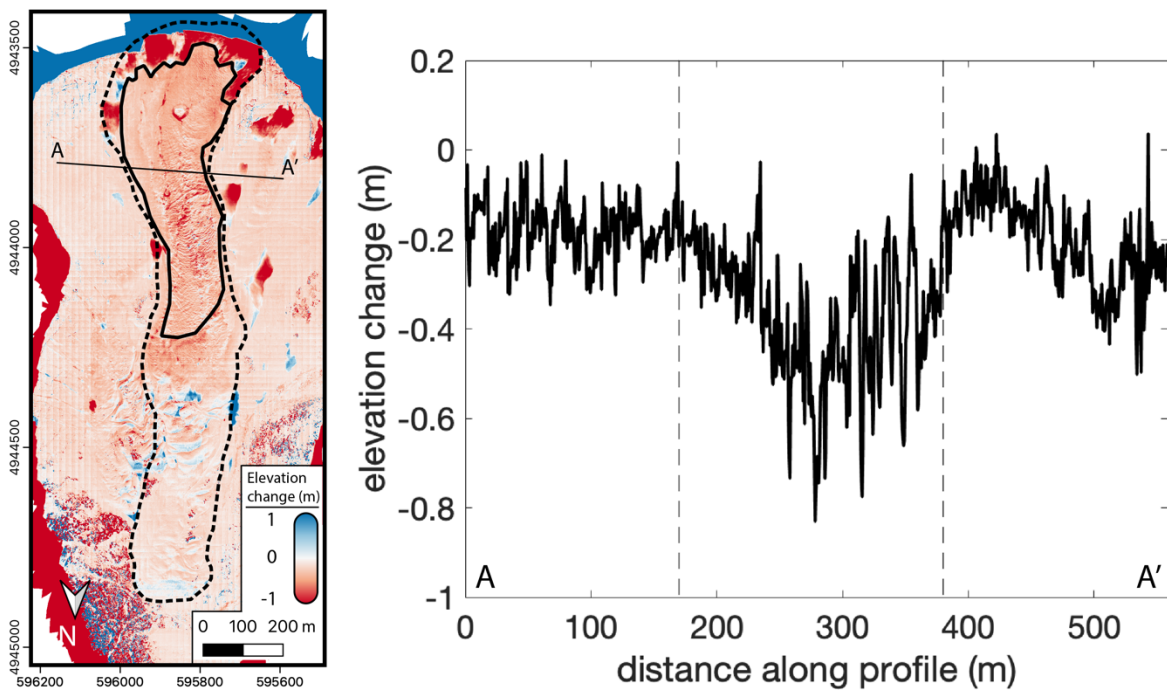
Supplementary Figures for *Photogrammetric monitoring of rock glacier motion using high-resolution cross-platform datasets: formation age estimation and modern thinning rates*



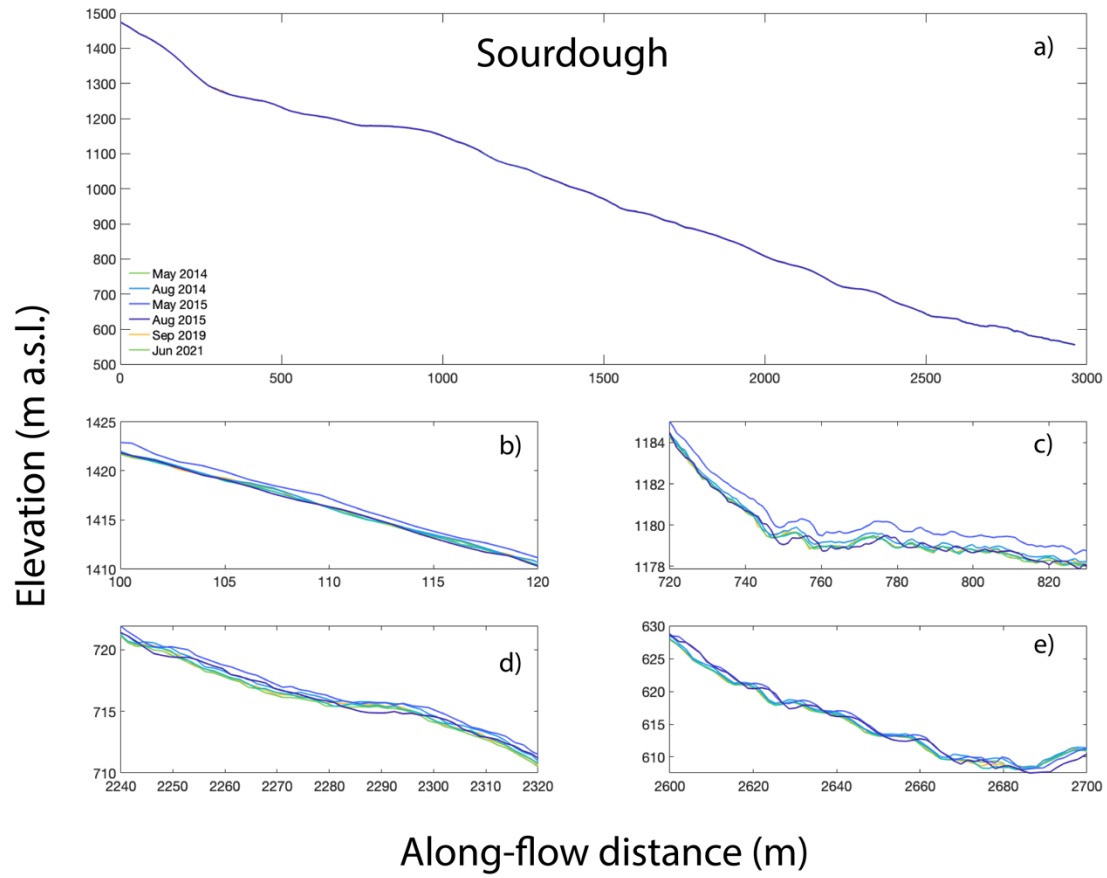
**Figure S1:** Workflow diagram showing the methodology for combining UAS, airborne, and satellite data to measure each rock glacier's horizontal displacement and elevation change.



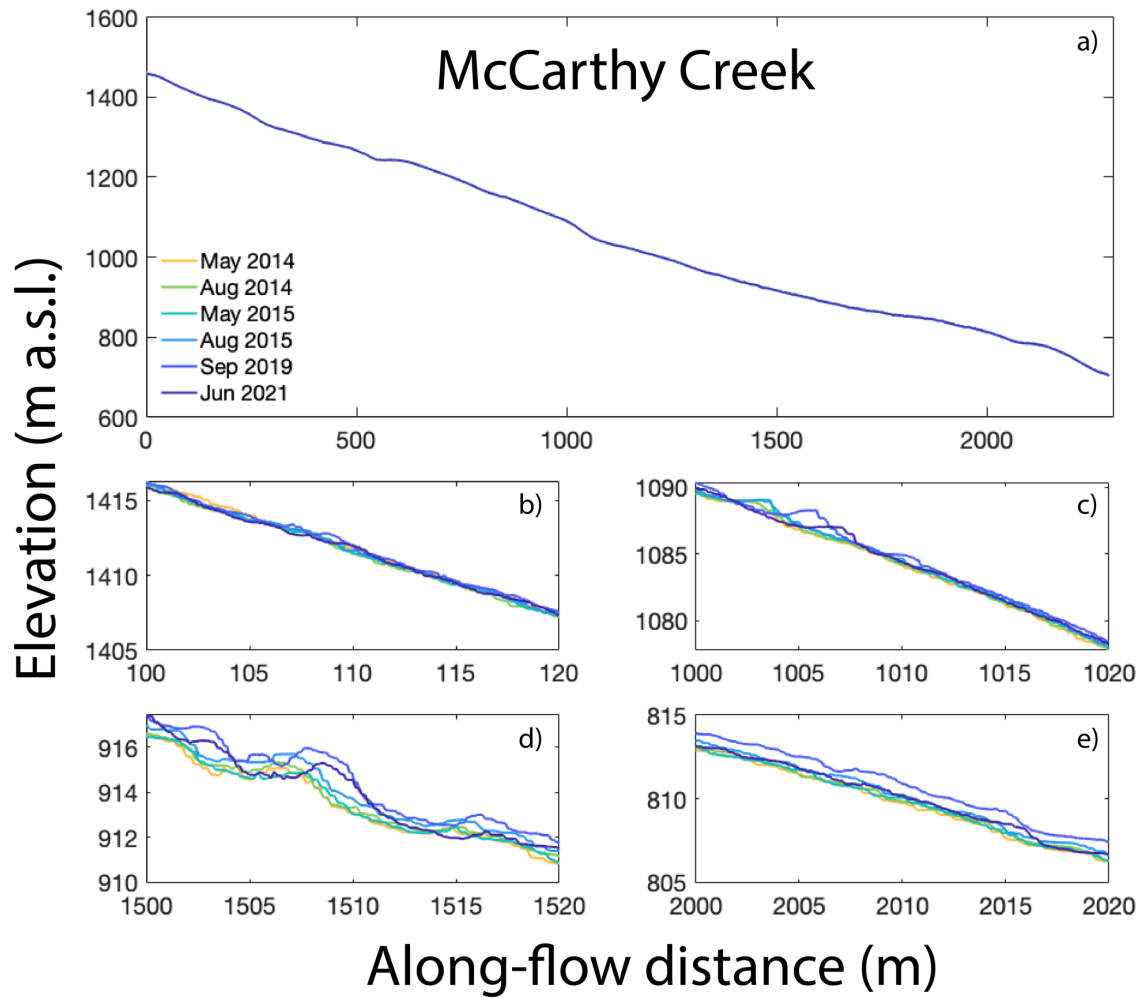
**Figure S2:** Sequence of change detection results at Sourdough where the first image in each pair is the May 2014 orthomosaic, and the date listed for each panel is the second image in the pair. These results show varying levels of noise, but they also reveal a consistent signal in the velocity field with no apparent surges or seasonal patterns detected.



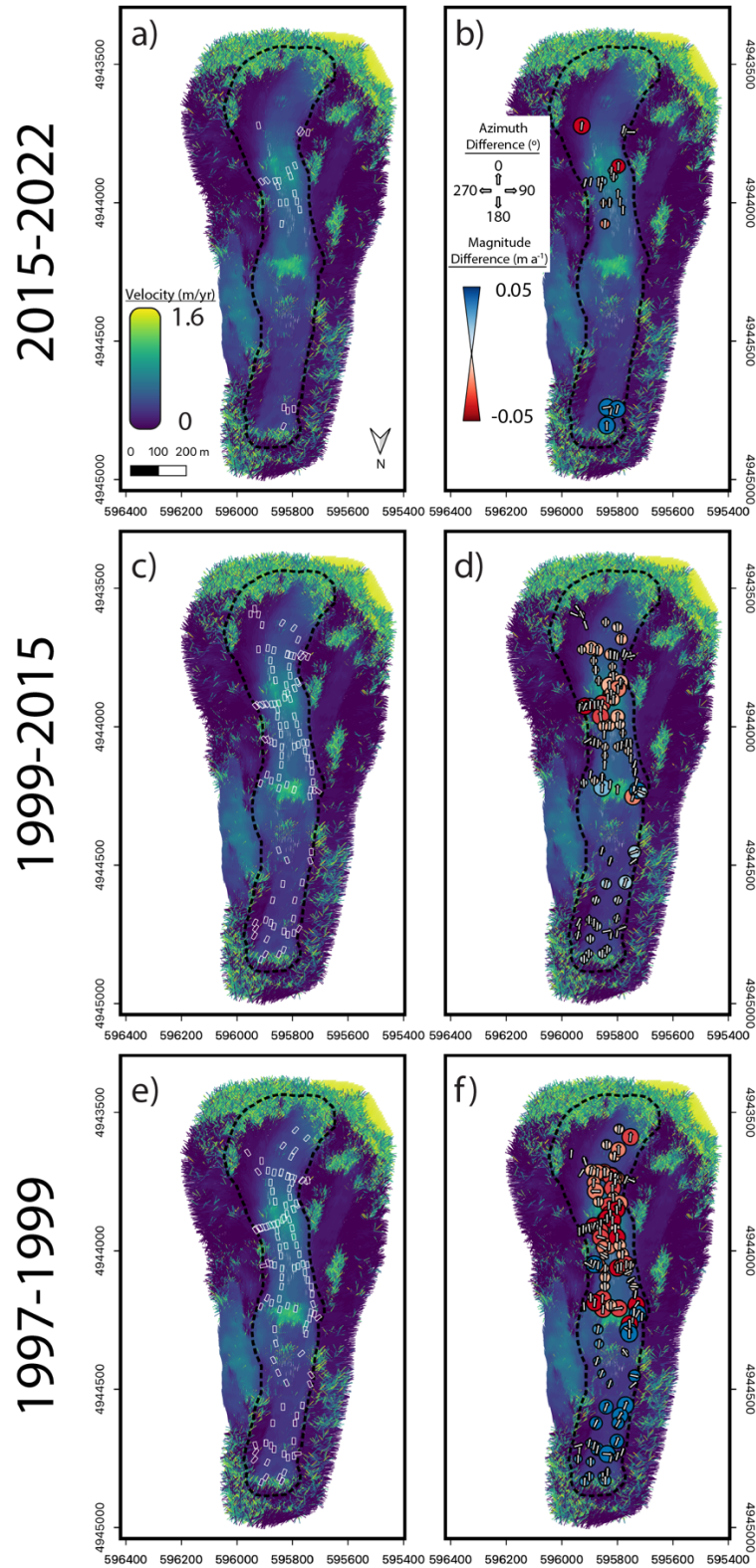
**Figure S3:** The left panel is a map showing elevation change when subtracting the August 2020 DEM from the August 2022 DEM at Galena Creek. The profile A-A' in the map is plotted in the right panel. The dashed lines in each panel mark the mapped rock glacier margin.



**Figure S4:** (a) Full longitudinal elevation profile for six different DEMs at Sourdough following the profile mapped in Figure 5b. Panels b-e show progressing subsets along this profile, where the motion of surface ridges can be observed and the uncertainty in the elevation data can be characterized; the September 2019 DEM is a clear outlier from the other plotted years, and there does not appear to be an correlation of elevation increase or decrease with increasing time.



**Figure S5:** (a) Full longitudinal elevation profile for six different DEMs at McCarthy Creek following the profile mapped in Figure 7b. Panels b-e show progressing subsets along this profile.



**Figure S6:** Comparison of surface-based boulder velocity measurements for the time intervals 2015-2022 (a & b), 1999-2015 (c & d) and 1997-1999 (e & f) with the 2020-2022 surface velocity field measured via UAS. The panels in the left column show the velocity vectors colored according to their magnitude and oriented in the appropriate direction, and the panels in the right column visualize the magnitude and azimuth differences between the remotely sensed velocity vectors and the surface-based velocity vectors for each time interval shown.