

Supplementary Bed Material Comparisons

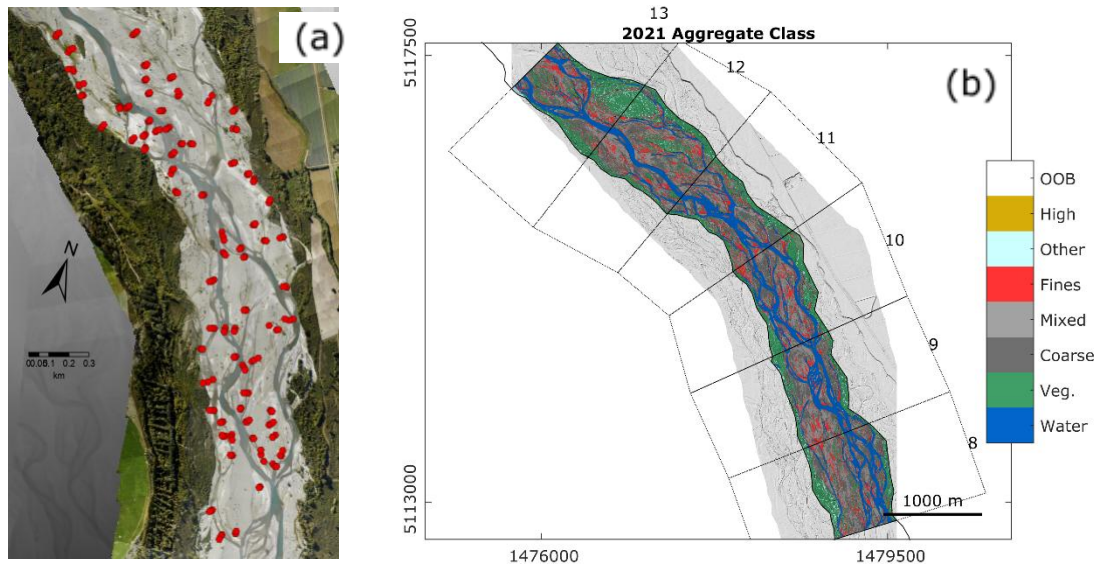


Figure S1 – (a) Map of NIWA (now ESNZ) pebble count data $N > 200$ pebble counts in riffle/run/pool channel types and bed, bank and bar top geomorphic units between river kms 9-12 (imagery: this study). (b) Aggregate class map from this study

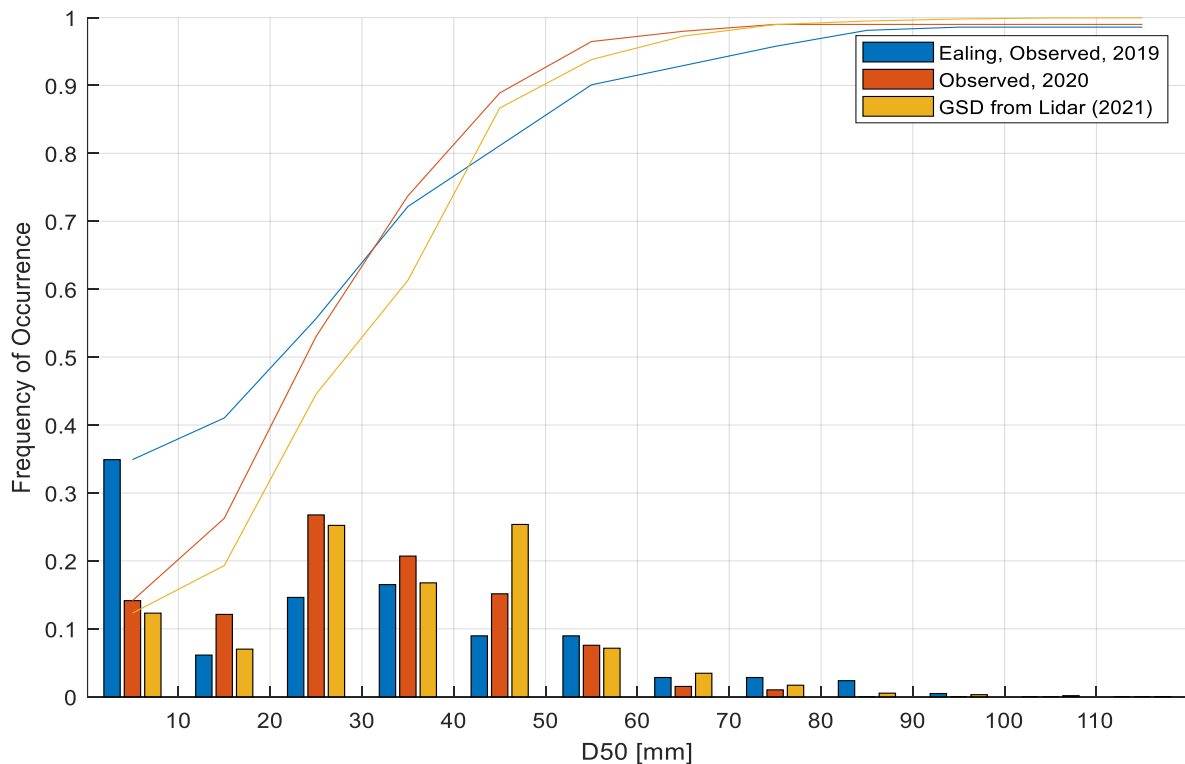


Figure S2 – Histogram and cumulative frequency of median grain size (D50) from observed pebble counts in 2019 and 2020, and D50 on exposed (non-vegetated) braidplain estimated from the class-based GSD aggregation (Section 3.1).

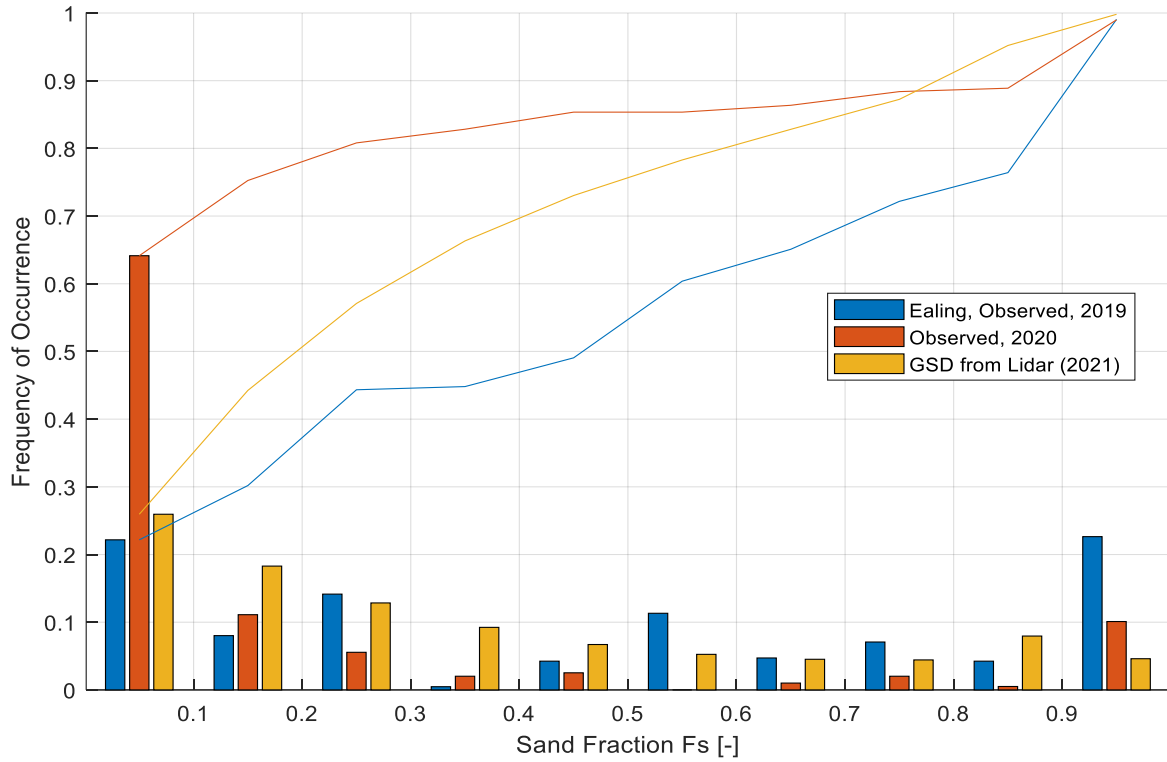


Figure S3 – Histogram and cumulative frequency of surficial sand fraction (F_s) from observed pebble counts in 2019 and 2020, compared with the F_s on exposed (non-vegetated) braidplain inferred from the class-based GSD estimates (Section 3.1).

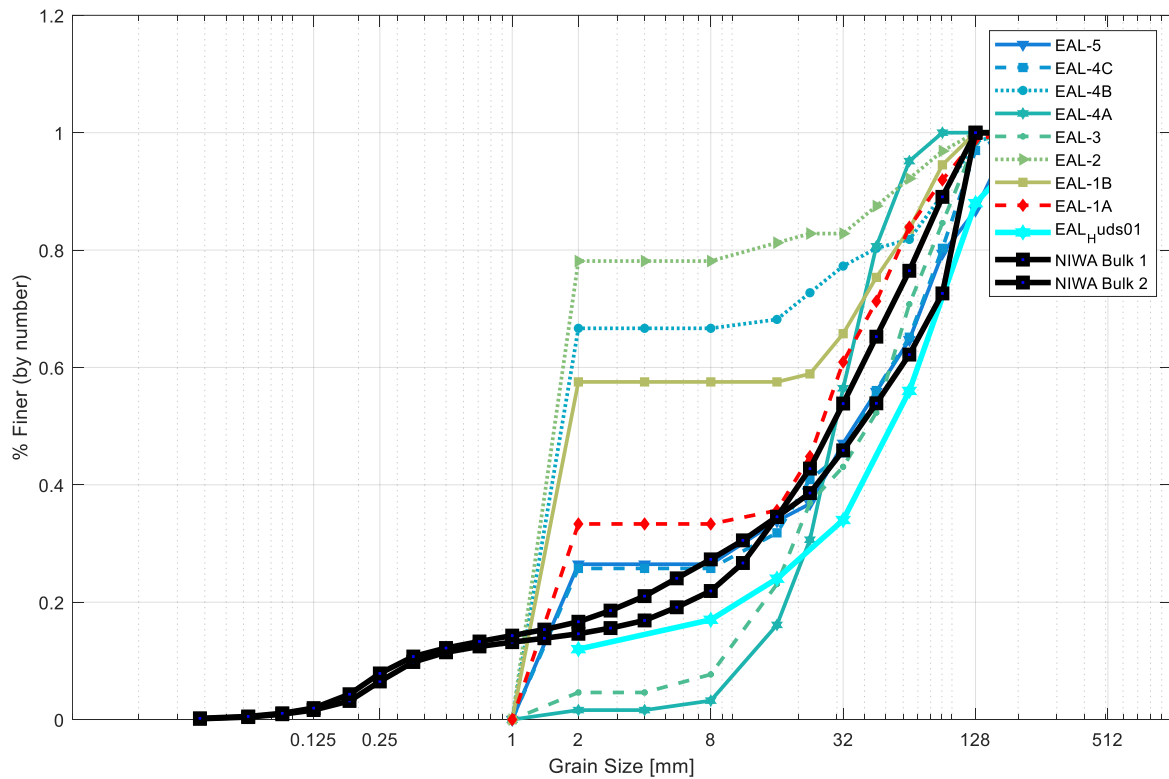


Figure S4 – Grain size distribution from two bulk samples, compared with surficial pebble counts from this study (Section 3.1).

Supplementary Model Inundation Images

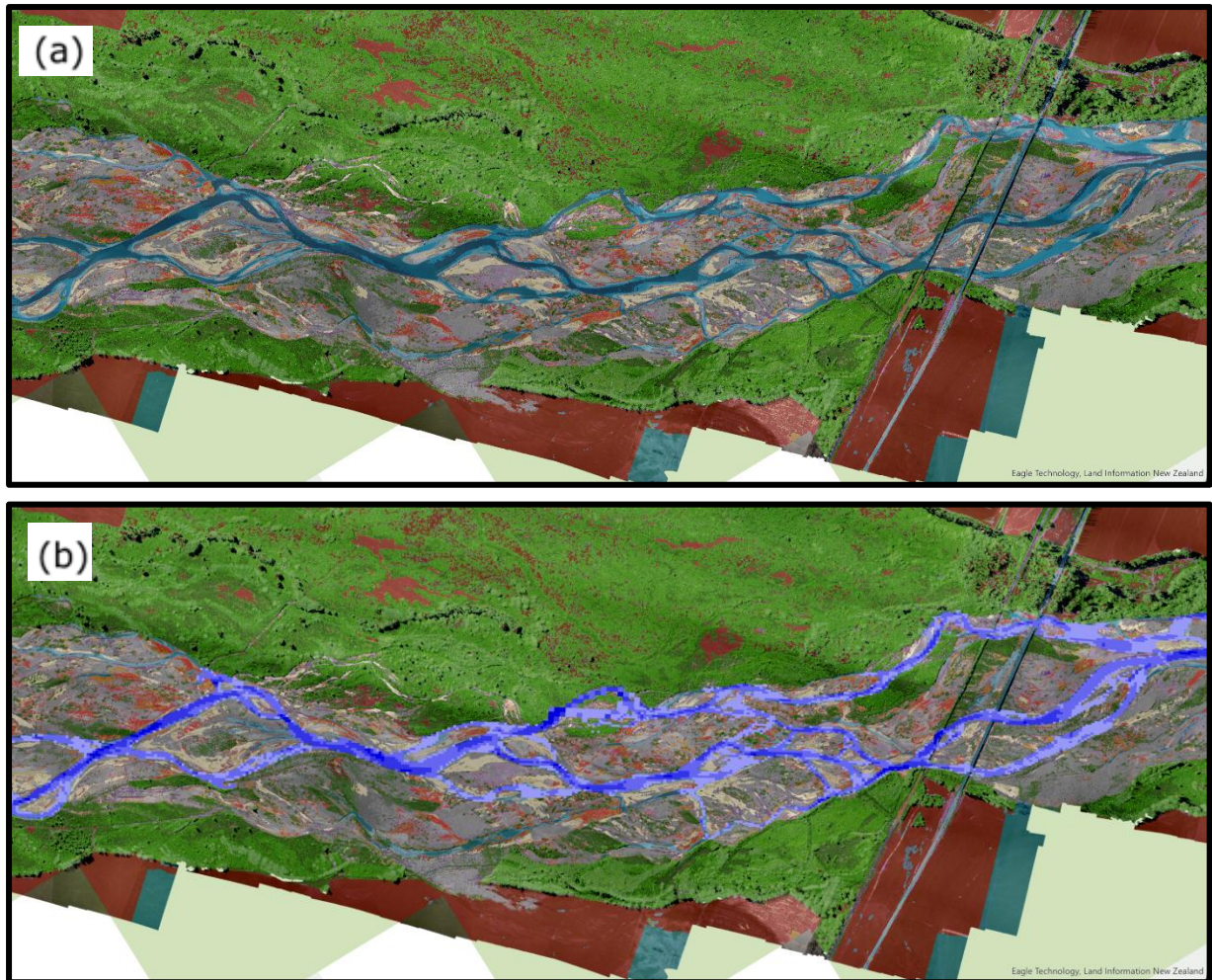


Figure S5 – (a) Classified riverbed facies, KM 20. Flow rate during acquisition $26 \pm 1 \text{ m}^3/\text{s}$ (b) Modelled depth of inundation overlay, $Q_{\text{model}} = 25 \text{ m}^3/\text{s}$ (Section 4.1).

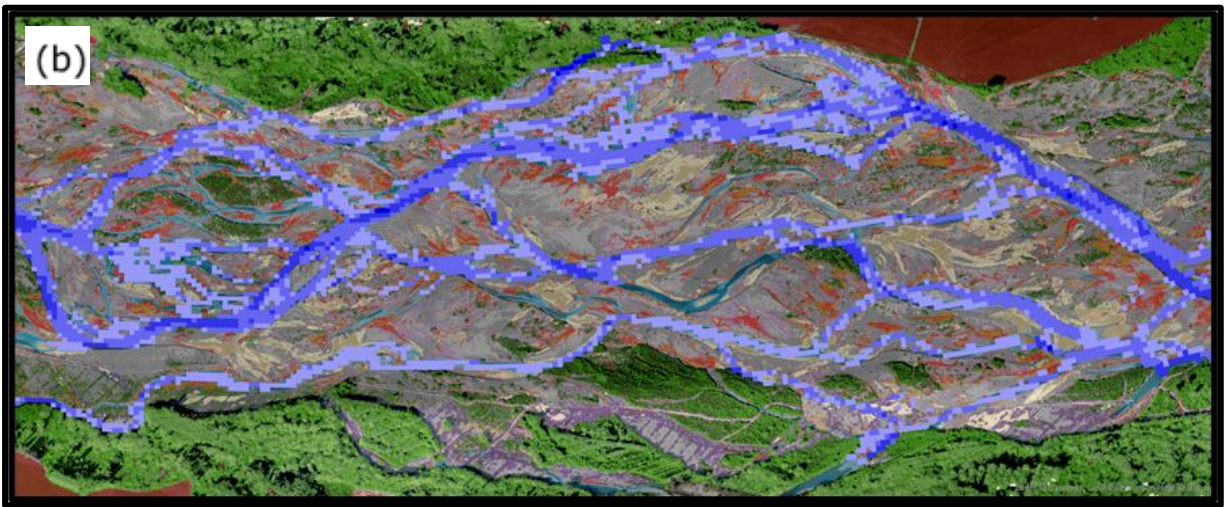
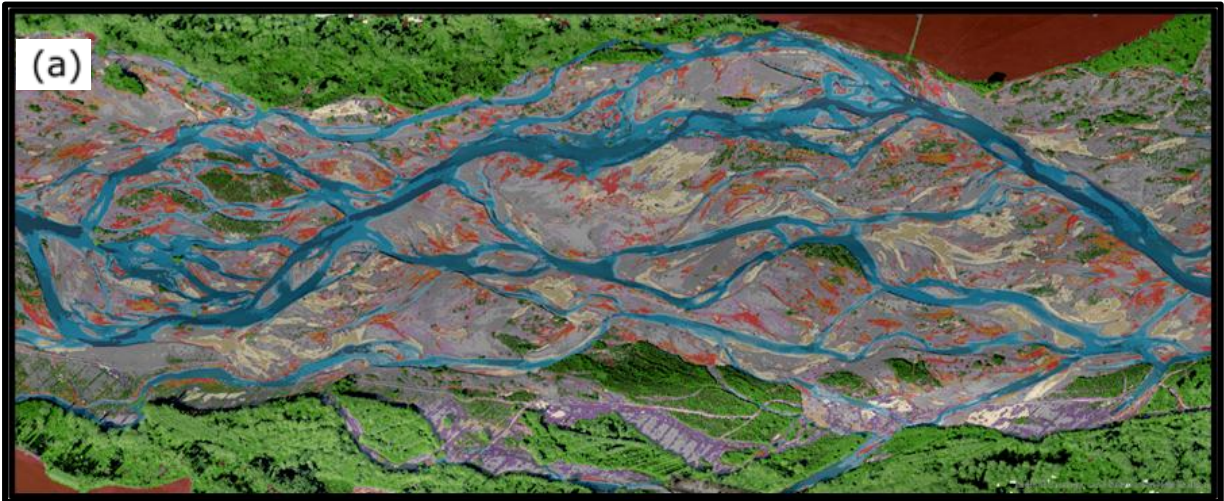


Figure S6 – (a) Classified riverbed facies, KM 3. Flow rate during acquisition $26 \pm 1 \text{ m}^3/\text{s}$ (b) Modelled depth of inundation overlay, $Q_{\text{model}} = 25 \text{ m}^3/\text{s}$ (Section 4.1).

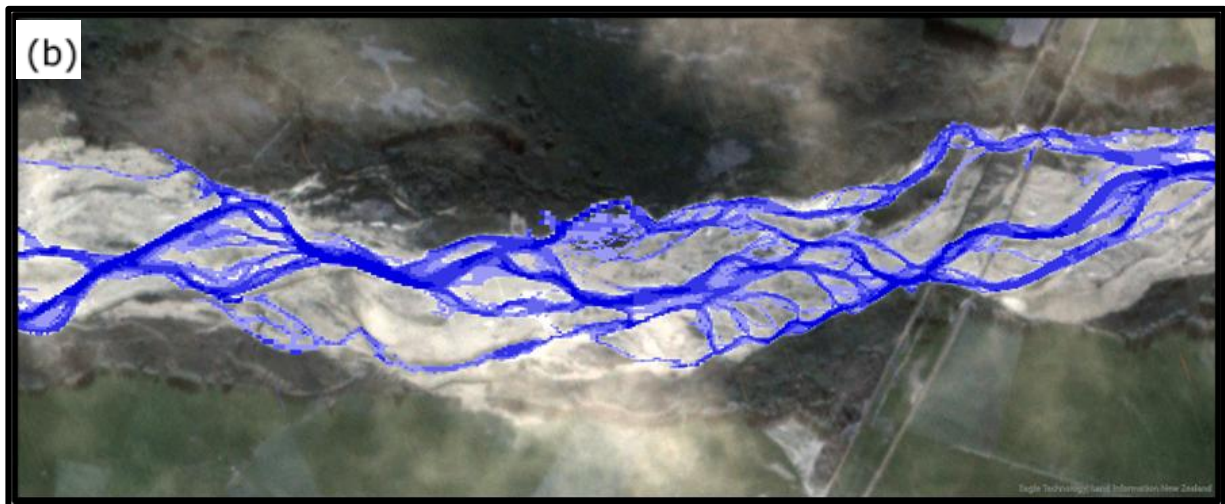


Figure S7 – (a) Planet.com image. 10 April 2021, KM 20. Flow rate during acquisition between 150 and 182 m³/s (uncertainty due to flow abstraction and event celerity) (b) Modelled depth of inundation overlay, $Q_{\text{model}} = 163 \text{ m}^3/\text{s}$.

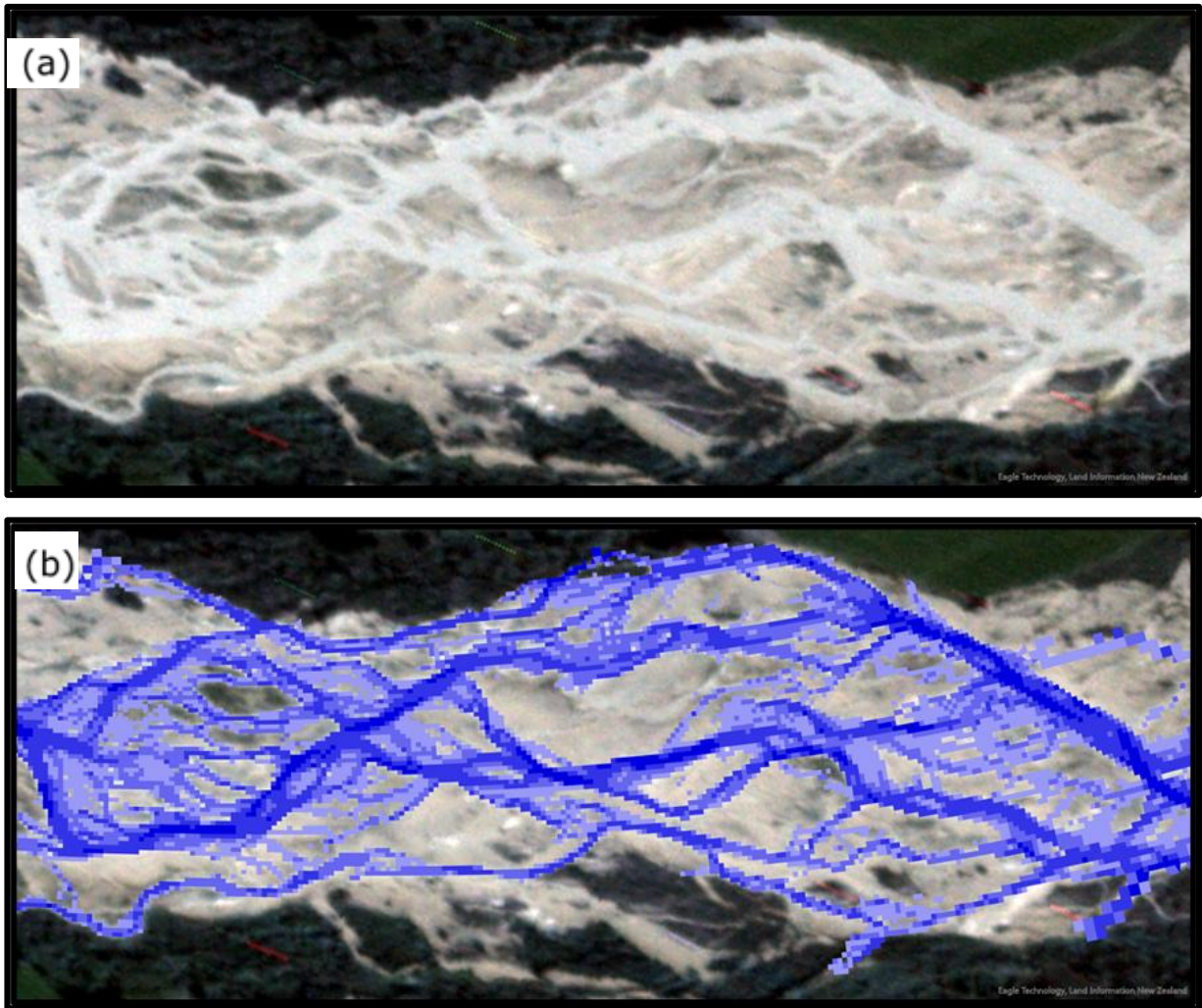


Figure S7 – (a) Planet.com image. 10 April 2021, KM 3. Flow rate during acquisition between 150 and 182 m³/s (uncertainty due to flow abstraction and event celerity) (b) Modelled depth of inundation overlay, $Q_{\text{model}} = 163 \text{ m}^3/\text{s}$.