

Figure 1. (a) A map of Svalbard with two of the three study sites; Endalen and Ringdalen. (b) A map of Alaska with the third study site, Saviukviayak. (c) View looking north-east down the Endalen valley, image taken by Huw Mithan.

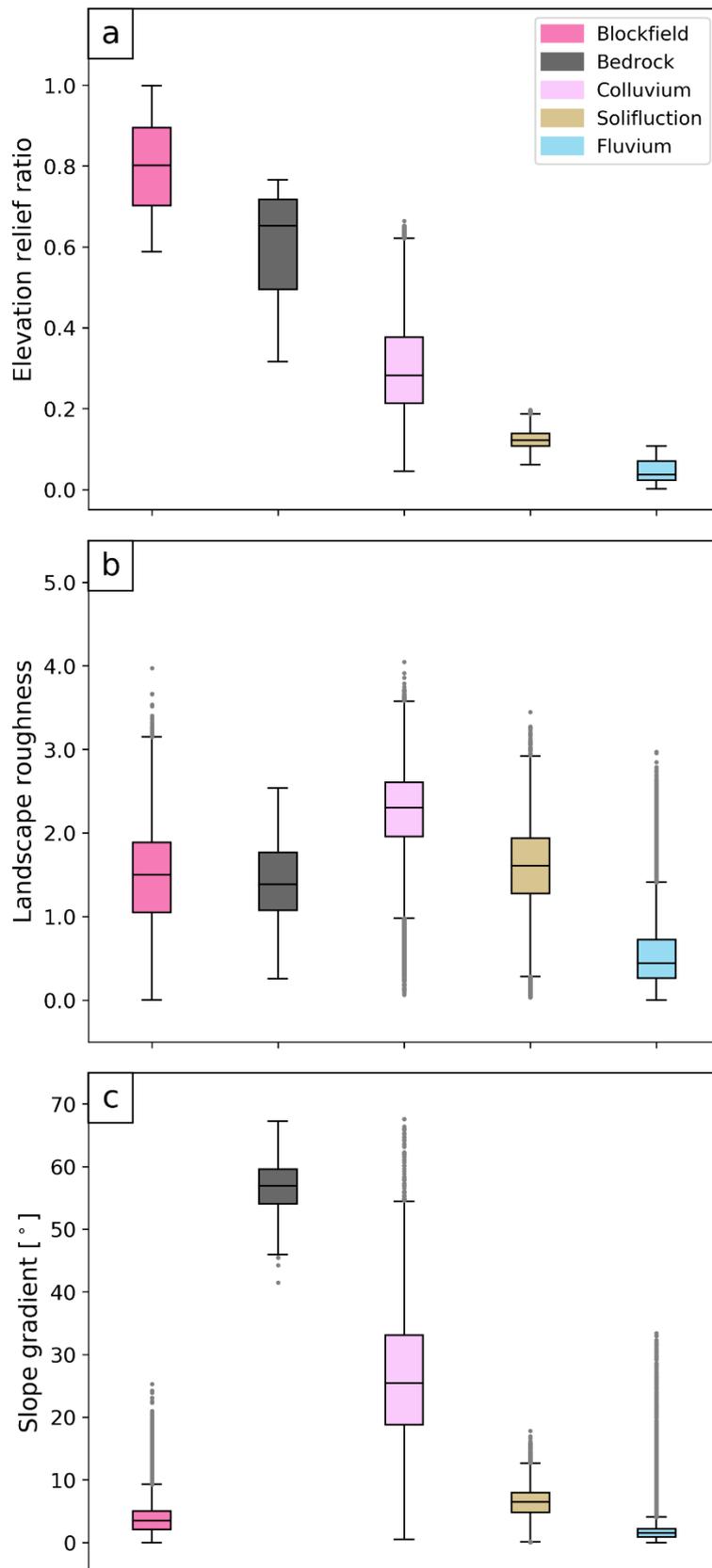


Figure 2. Topographic parameters for each landform used to train the classifier. (a) Elevation-relief ratio. (b) Landscape roughness. (c) Slope gradient.

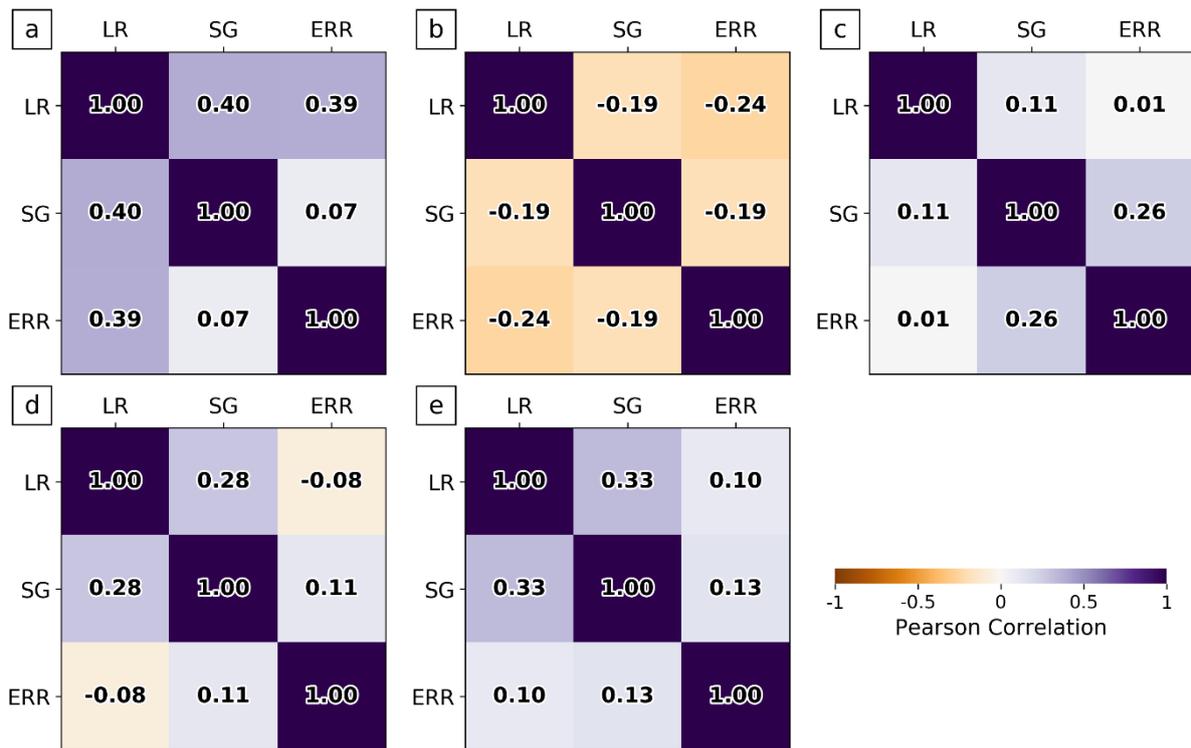


Figure 3. Pearson correlation between three topographic parameters for each landform. Landscape roughness (LR), slope gradient (SG), Elevation-relief ratio (ERR). (a) Blockfield, (b) bedrock, (c) colluvium, (d) solifluction sheet, and (e) fluvium.

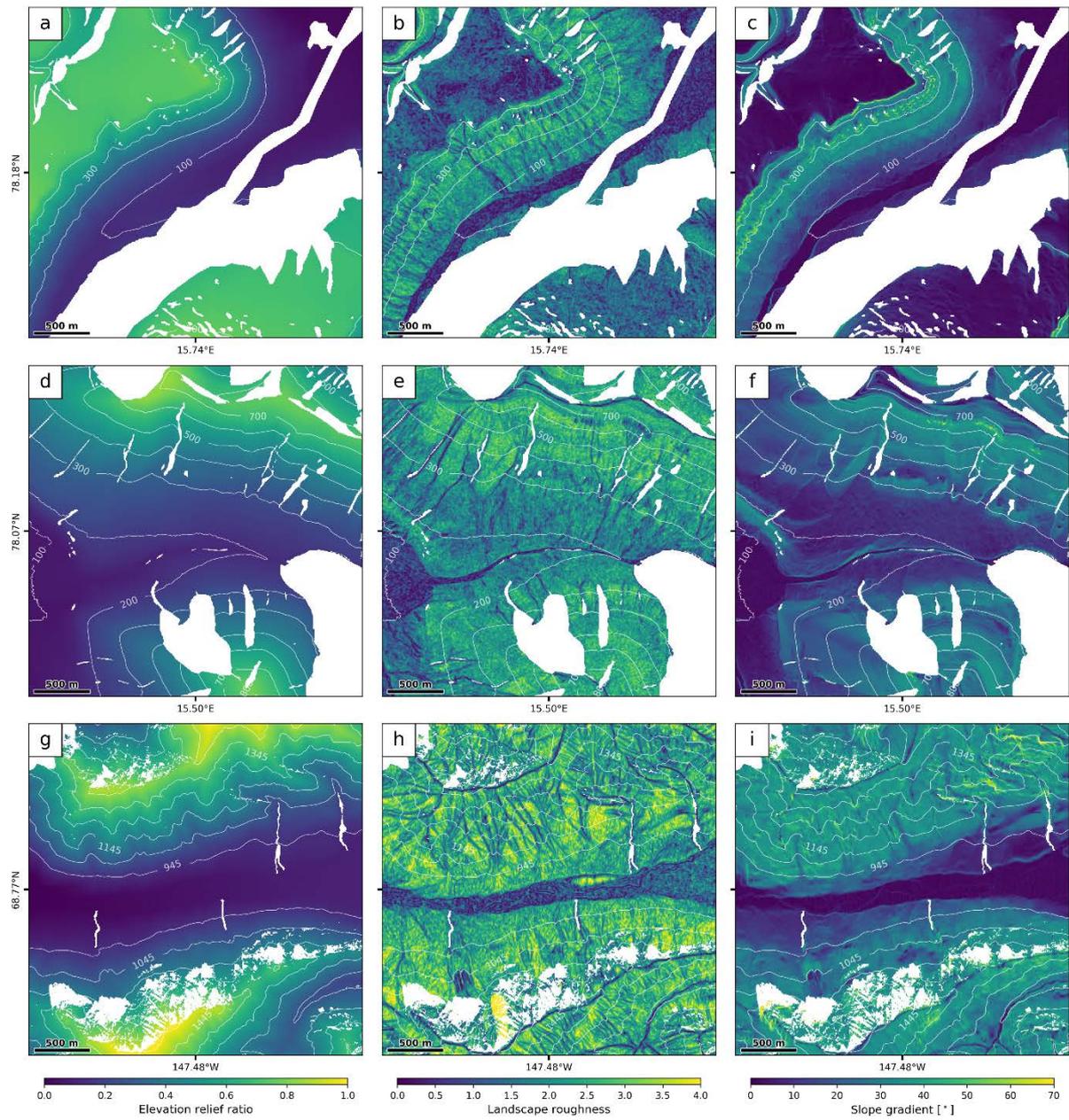


Figure 4. Elevation-relief ratio, landscape roughness, and slope gradient maps for each study site. (a – c) Endalen, (d – f) Ringdalen, (g – i) Saviukviayak. White areas represent regions with no data. Contours are in metres.

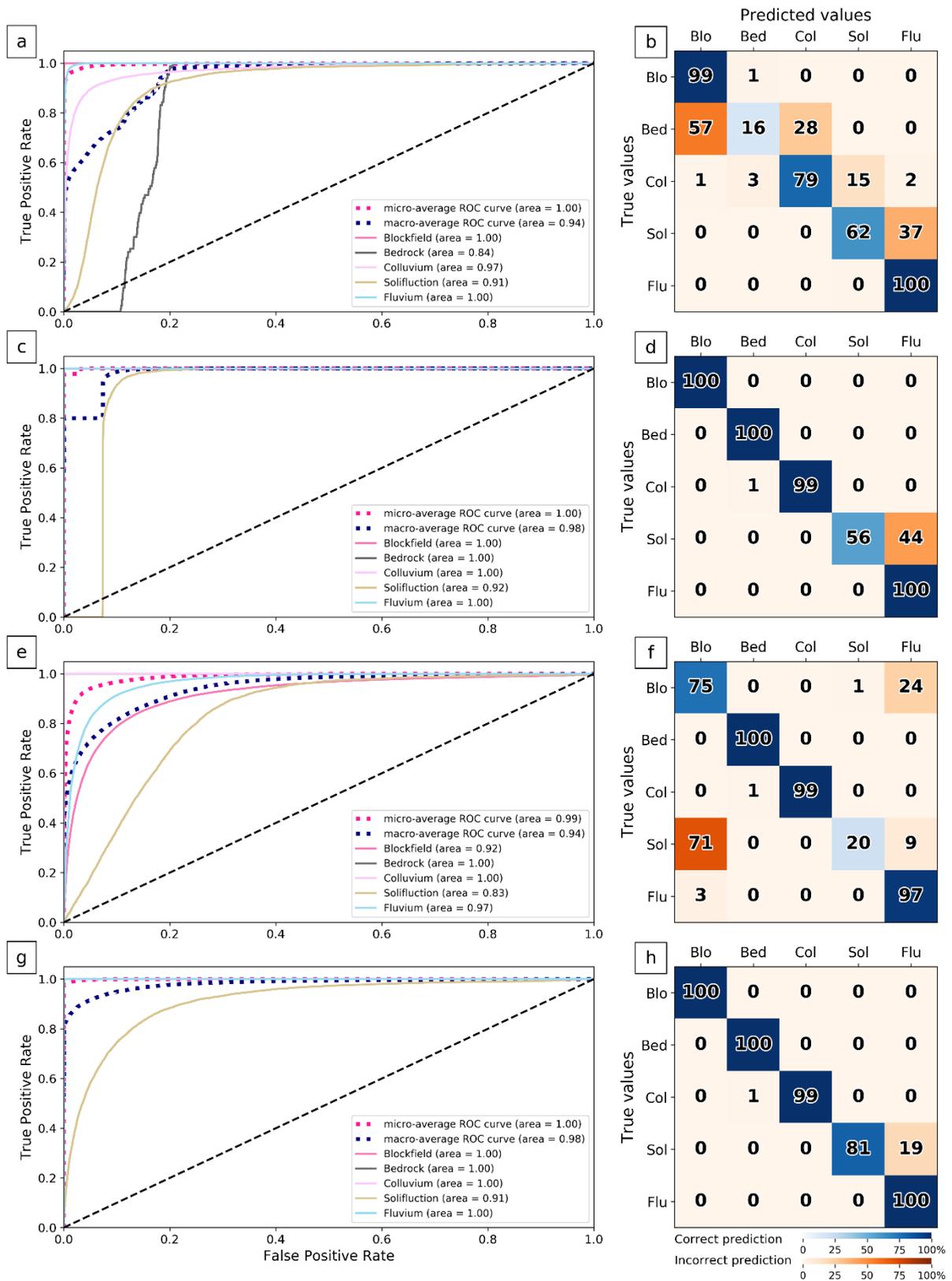


Figure 5. Area under the receiver operating characteristics curve (AUROC) when using a combination of topographic parameters to train the classifier. The plots on the right hand side are confusion matrices. (a – b) Elevation-relief ratio & landscape roughness. (c – d) Elevation-relief ratio & Slope gradient. (e – f) Landscape roughness & Slope gradient. (g – h) Elevation-relief ratio, landscape roughness, and slope gradient. Blockfield (Blo), Bedrock (Bed), Colluvium (Col), Solifluction (Sol), Fluvium (Flu).

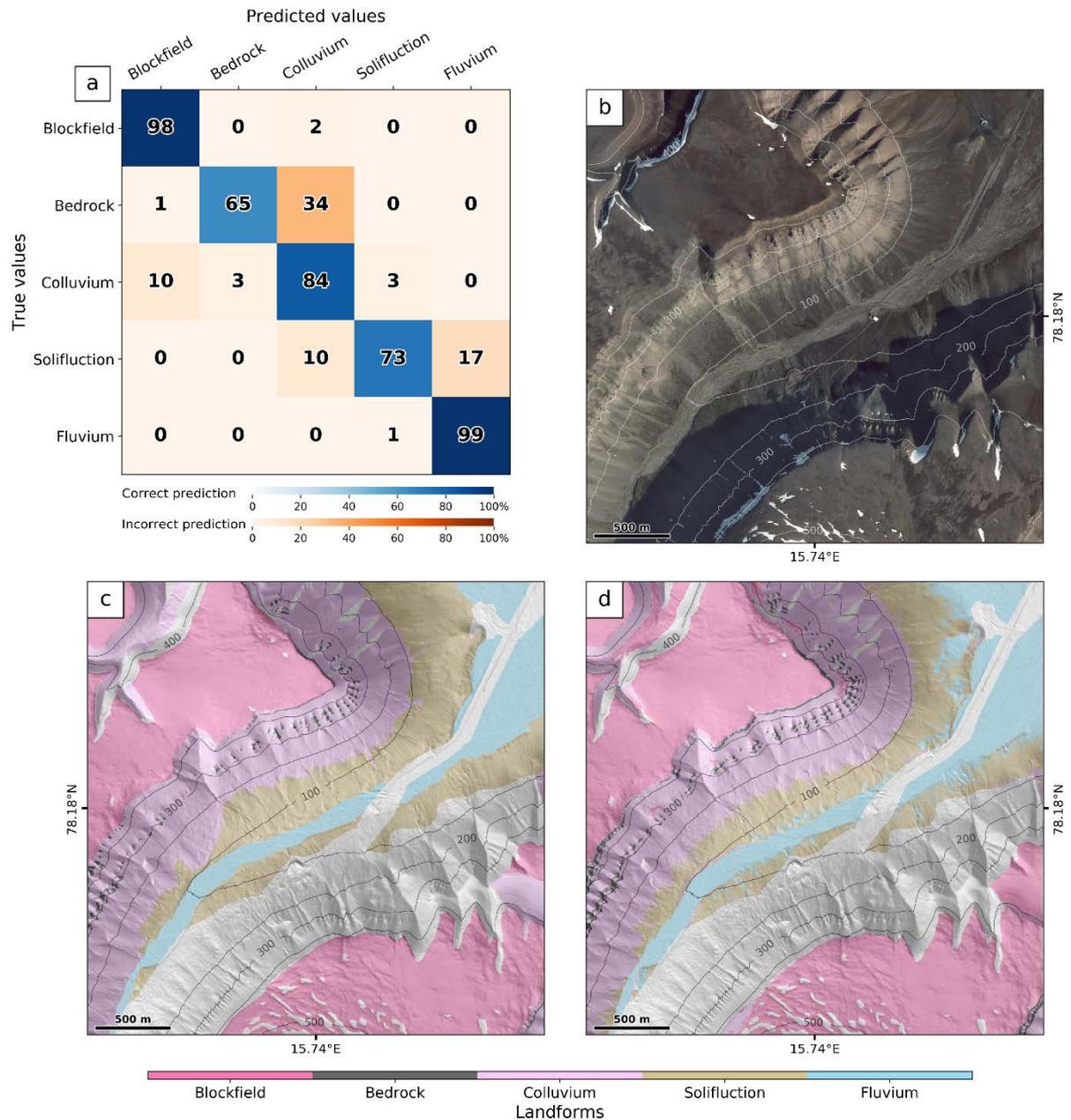


Figure 6. Endalen. (a) Confusion matrix comparing our geomorphology map (true values) to the classifier's map (predicted values) in percent. (b) Satellite image of Endalen⁴⁰. (c) The authors' geomorphology map. (d) The classifier's geomorphology map. All images are underlain with a hillshade which may cause shading of the colour schemes. Grey areas are regions of no data which are showing the underlying hillshade. Contours are in metres.

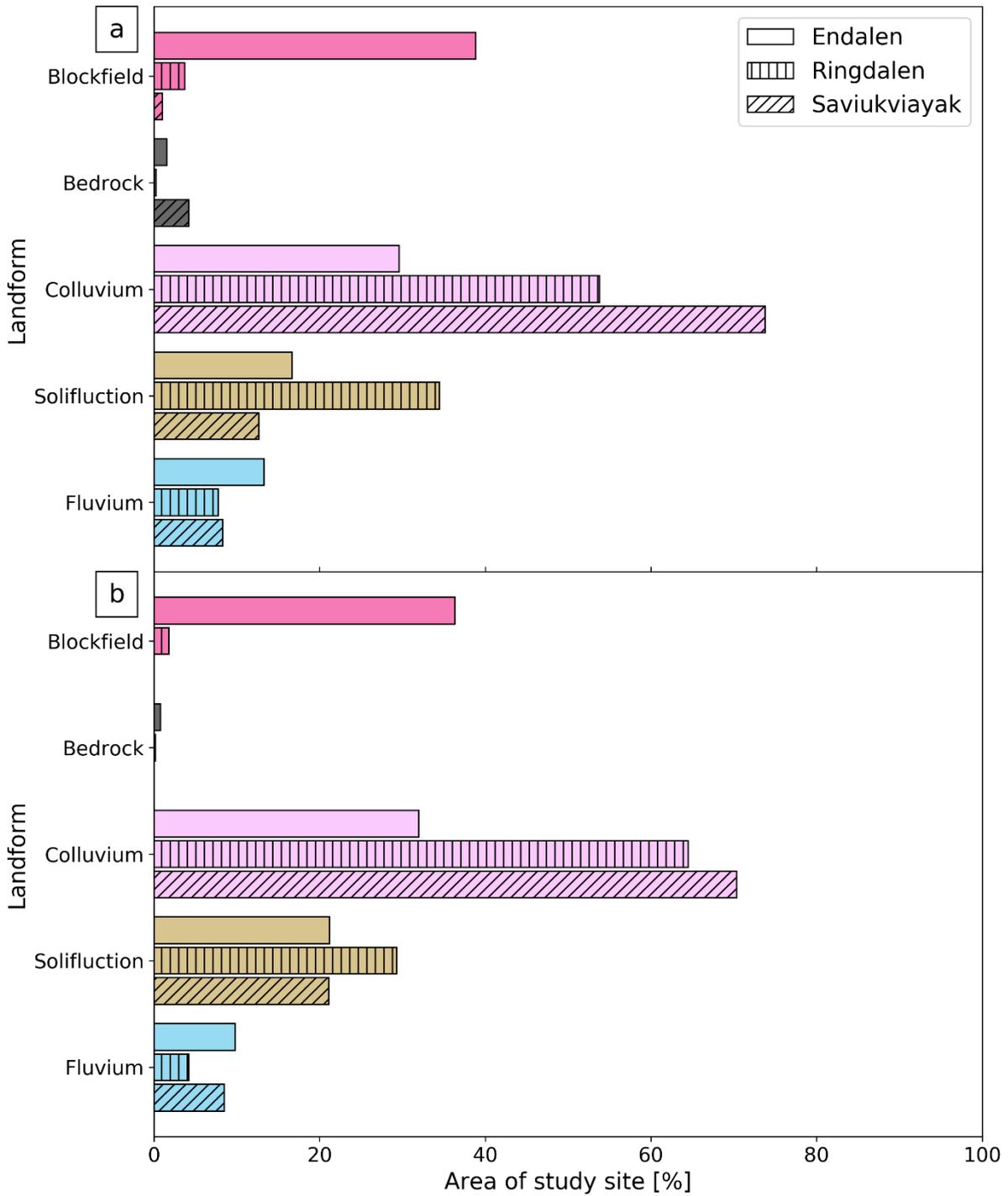


Figure 7. Bar chart showing the area occupied by each landform within all three study sites (excluding regions of no data). (a) Area of landforms in the authors' map. (b) Area of landforms in the classifier's map.

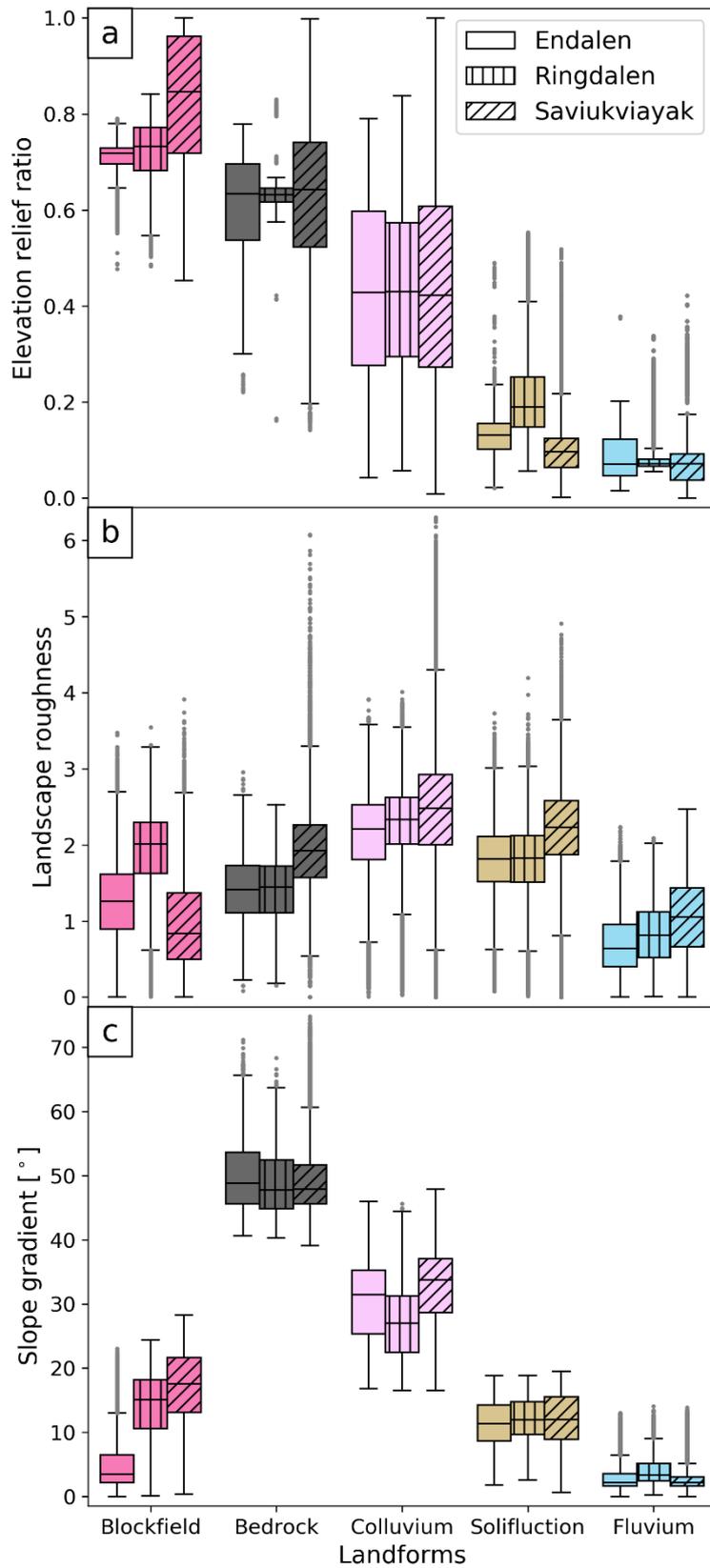


Figure 8. Topographic parameters of each landform from the classifier's map. (a) Elevation-relief ratio. (b) Landscape roughness. (c) Slope gradient.

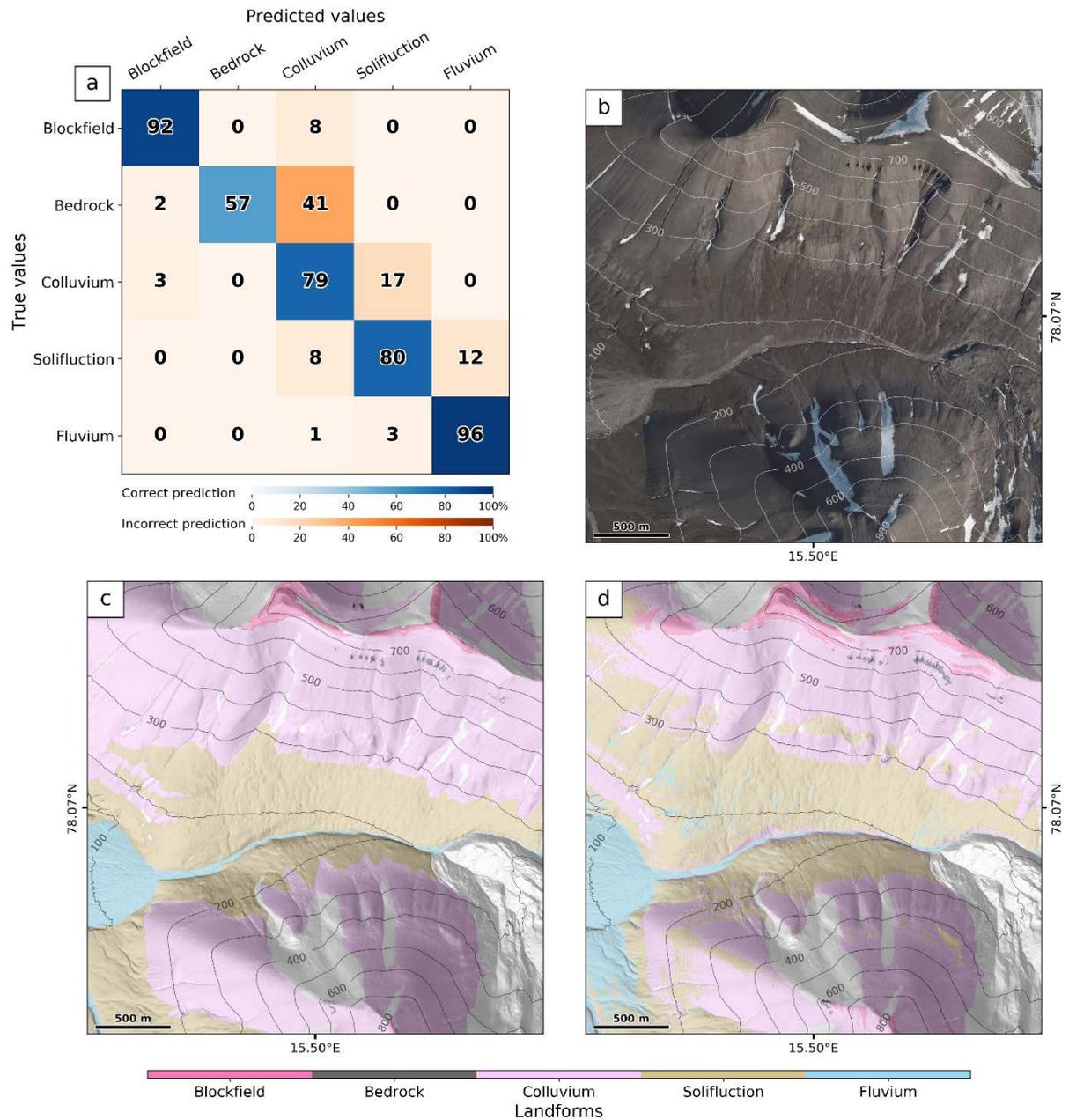


Figure 9. Ringdalen. (a) Confusion matrix comparing our geomorphology map (true values) to the classifier's map (predicted values) in percent. (b) Satellite image of Ringdalen⁴⁰. (c) The authors' geomorphology map. (d) The classifier's geomorphology map. All images are underlain with a hillshade which may cause shading of the colour schemes. Grey areas are regions of no data which are showing the underlying hillshade. Contours are in metres.

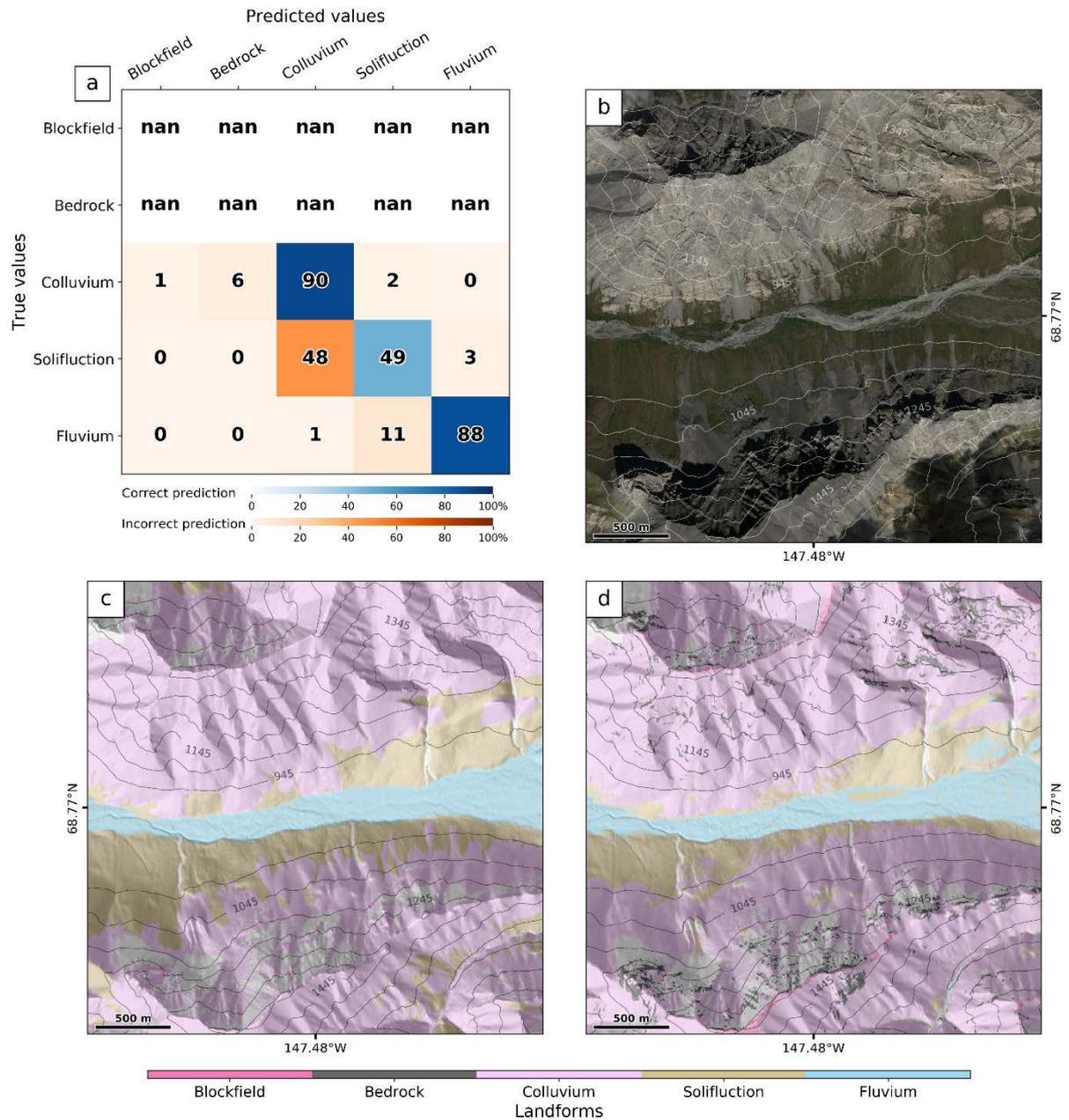


Figure 10. Saviukviayak. (a) Confusion matrix comparing our geomorphology map (true values) to the classifier's map (predicted values) in percent. 'nan' represents no data meaning that these landforms were not mapped by the authors. (b) Satellite image of Saviukviayak⁴¹. (c) The authors' geomorphology map. (d) The classifier's geomorphology map. All images are underlain with a hillshade which may cause shading of the colour schemes. Grey areas are regions of no data which are showing the underlying hillshade. Contours are in metres.

Adventdalen Landforms	Number of Polygons	Total Area [km ²]
Blockfield	5	4.46
Bedrock	23	0.01
Colluvium	26	1.75
Solifluction	4	0.53
Fluvium	13	19.02

Table 1. Geometry of landforms used to train the classifier.