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The effect of the formation of the micro-terracetts on the connectivity of the sediment transport on sandy granitic soil

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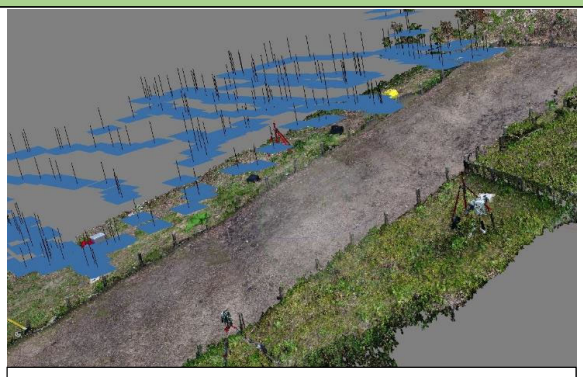
Topographic Measurement – UAV-SfM method

UAV (Phantom4 Pro, Dji)

S.D. 4mm (Compared with Terrestrial Laser scan)

Digital Surface Model (DSM)

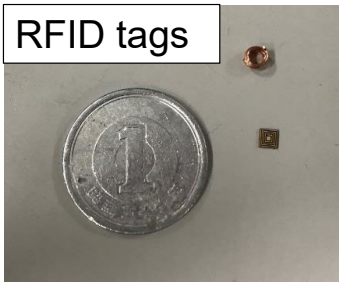


Point cloud data created with Photoscan (Agisoft)

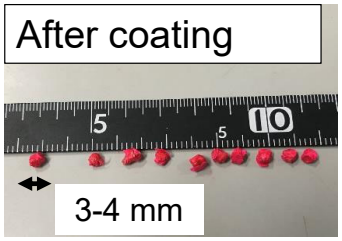
Topographic data(DSM, 1 cm grid), Surface Change(ArcGIS, Esri)

Sediment tracing – RFID tags

RFID tags



After coating



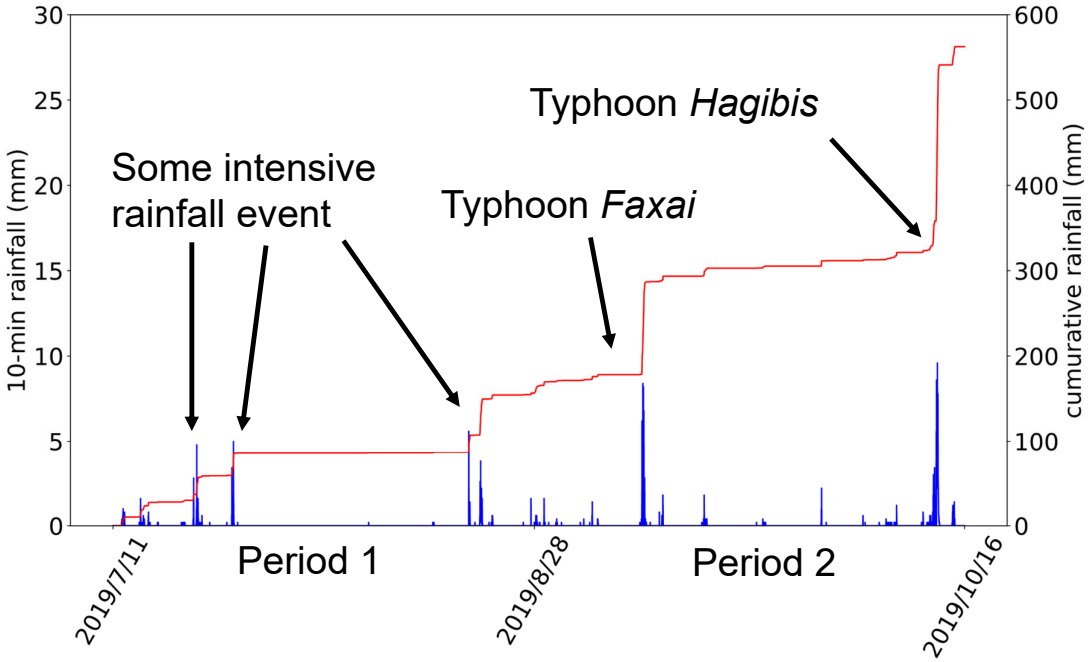
Setting

Orthomosaic Image

To ArcGIS

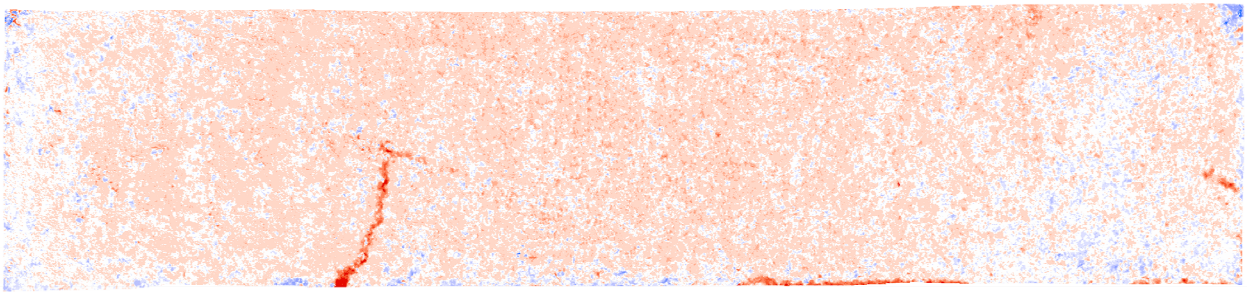
- XYZ coordinate
- Error: 3.1 cm (RMSE)
- 100 tags for each plot

Precipitation during survey period

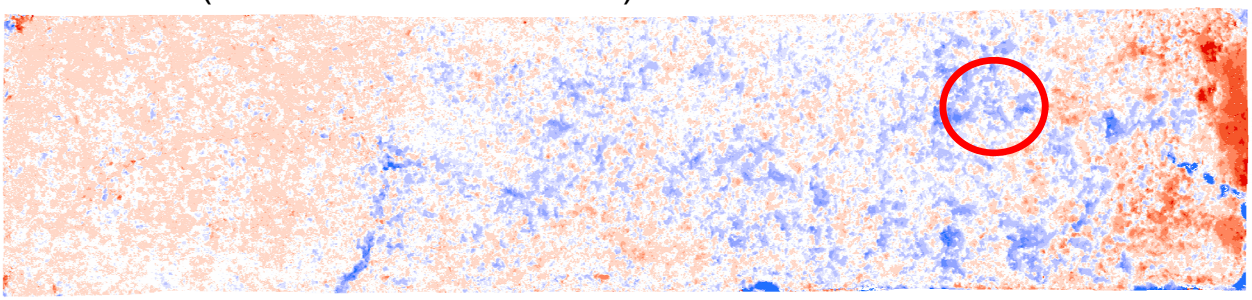


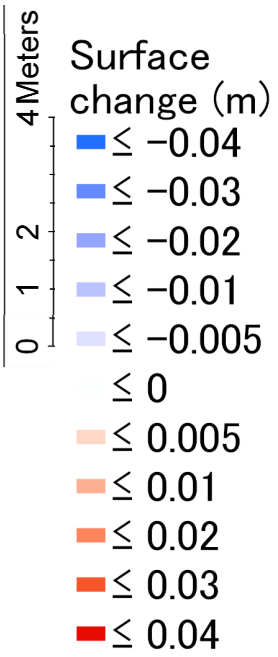
Soil surface change

Period 1 (2019/7/11 – 2019/8/28)



Period 2 (2019/8/28 – 2019/10/16)

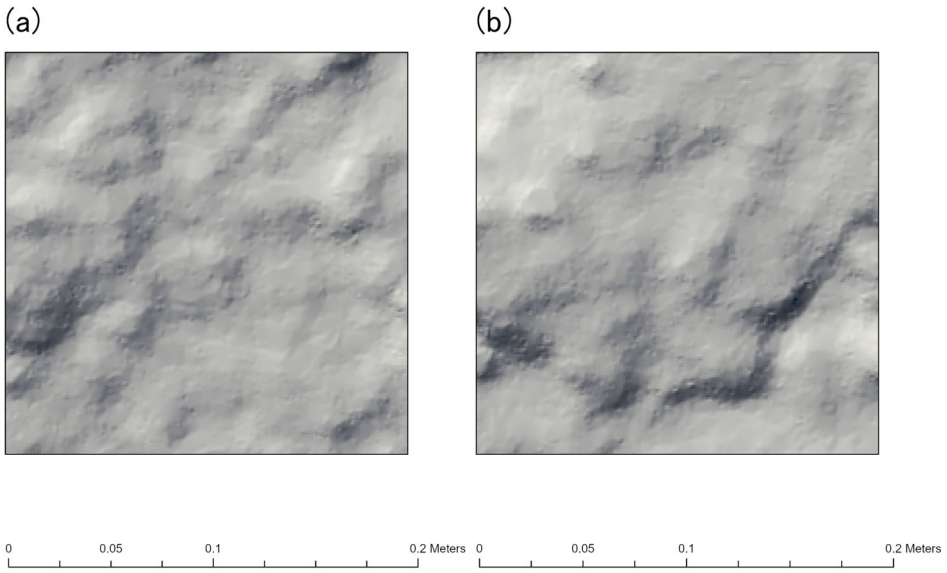




Expanded Surface change, hillshade (1mm)

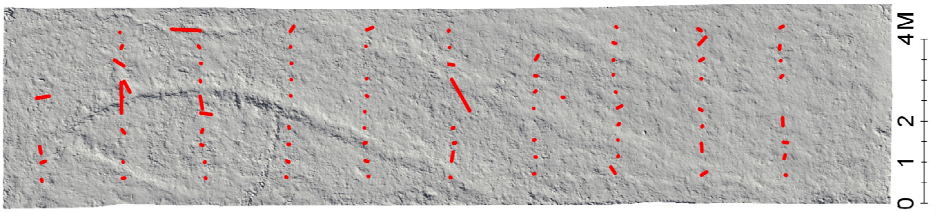
Deposited terracettes

(a) shows hillshade images with 1mm cell-size on 2019/08/26
(b) shows hillshade images with 1mm cell-size on 2019/10/16

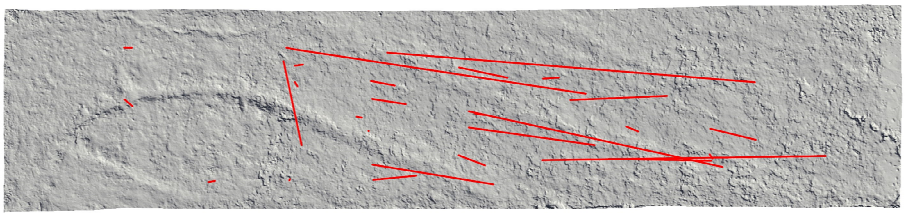


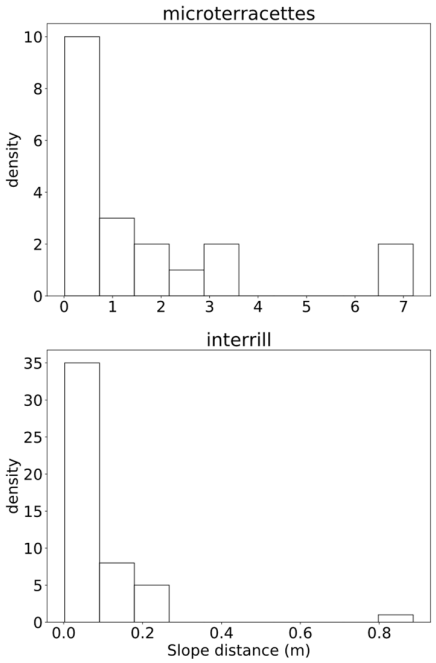
Transport of RFID tags

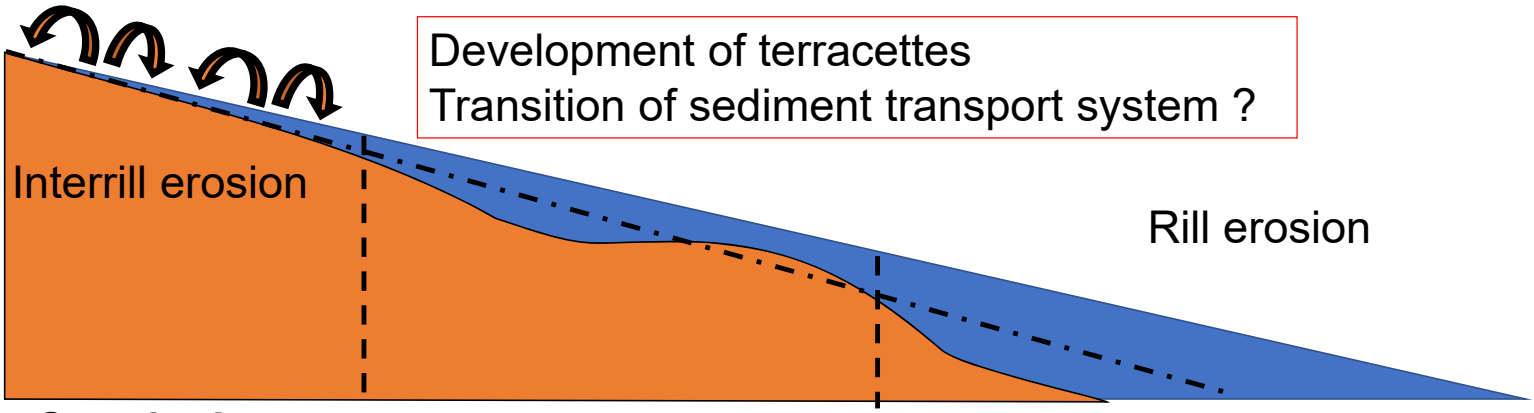
Period 1 (2019/7/11 – 2019/8/28)



Period 2 (2019/8/28 – 2019/10/16)







Conclusion

Step-like erosion and deposition were observed between 8/28/2019 – 10/16/2019. Soil surface change in this period showed that erosion and deposition were repeated and higher erosion on the lower slope position.

Median transport distance of RFID tags in the interrill areas is 4.1 cm, and 76 cm in the terracet areas. Therefore, we found the effect of soil mounds and the terracettes on the bare **soil connectivity significantly increase** the sediment connectivity and sediment transport distance.