

# Geological Model of Pićan Area, Istria

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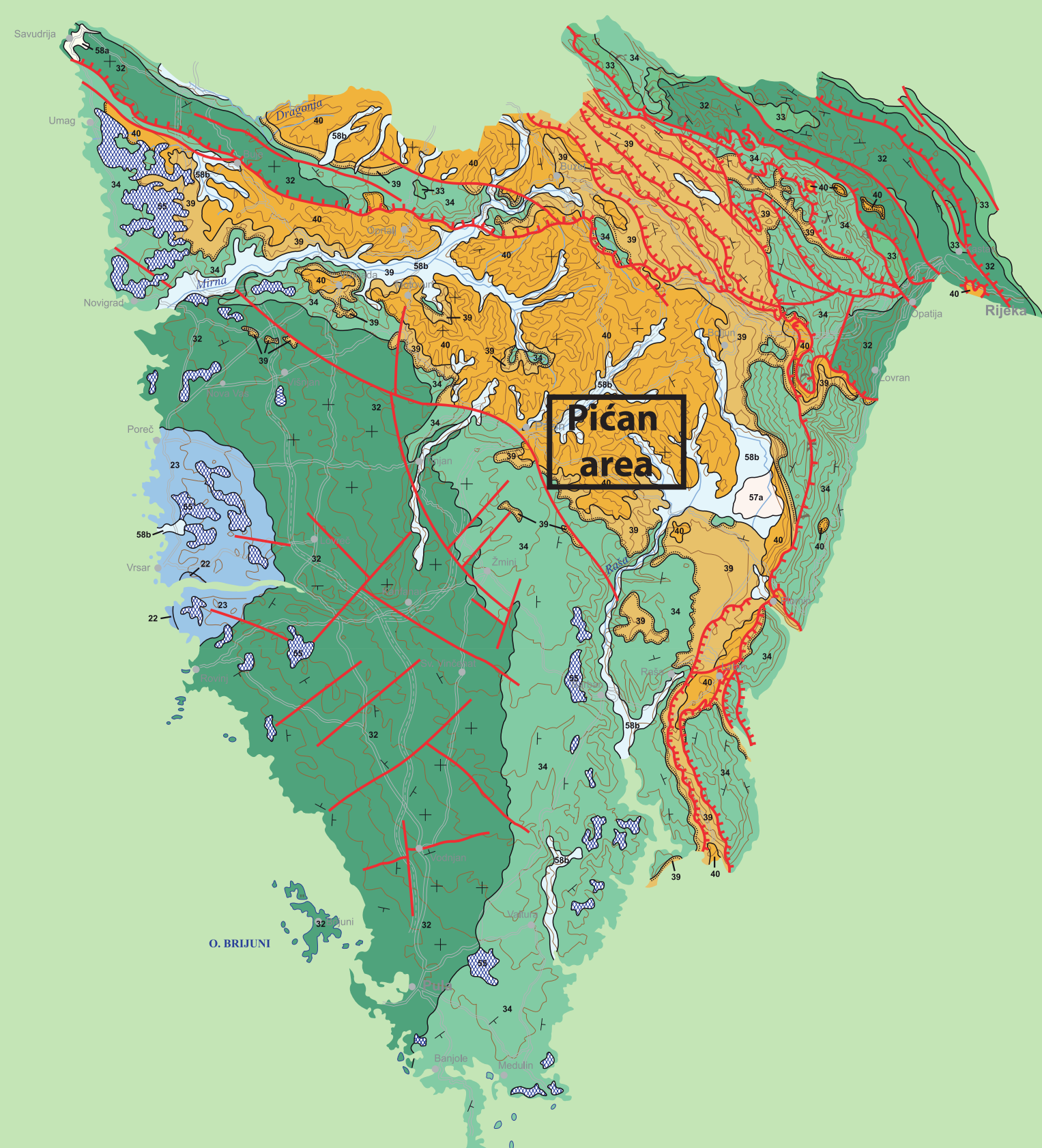
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**Fig. 1** Geological setting of Pićan area marked on Basic Geological map 1 : 300 000 of Croatia.



**Fig. 4** A geologist operating e-Bee plus UAV used for creating orthophoto image and DSM (Digital Surface Model) of the Pićan area.



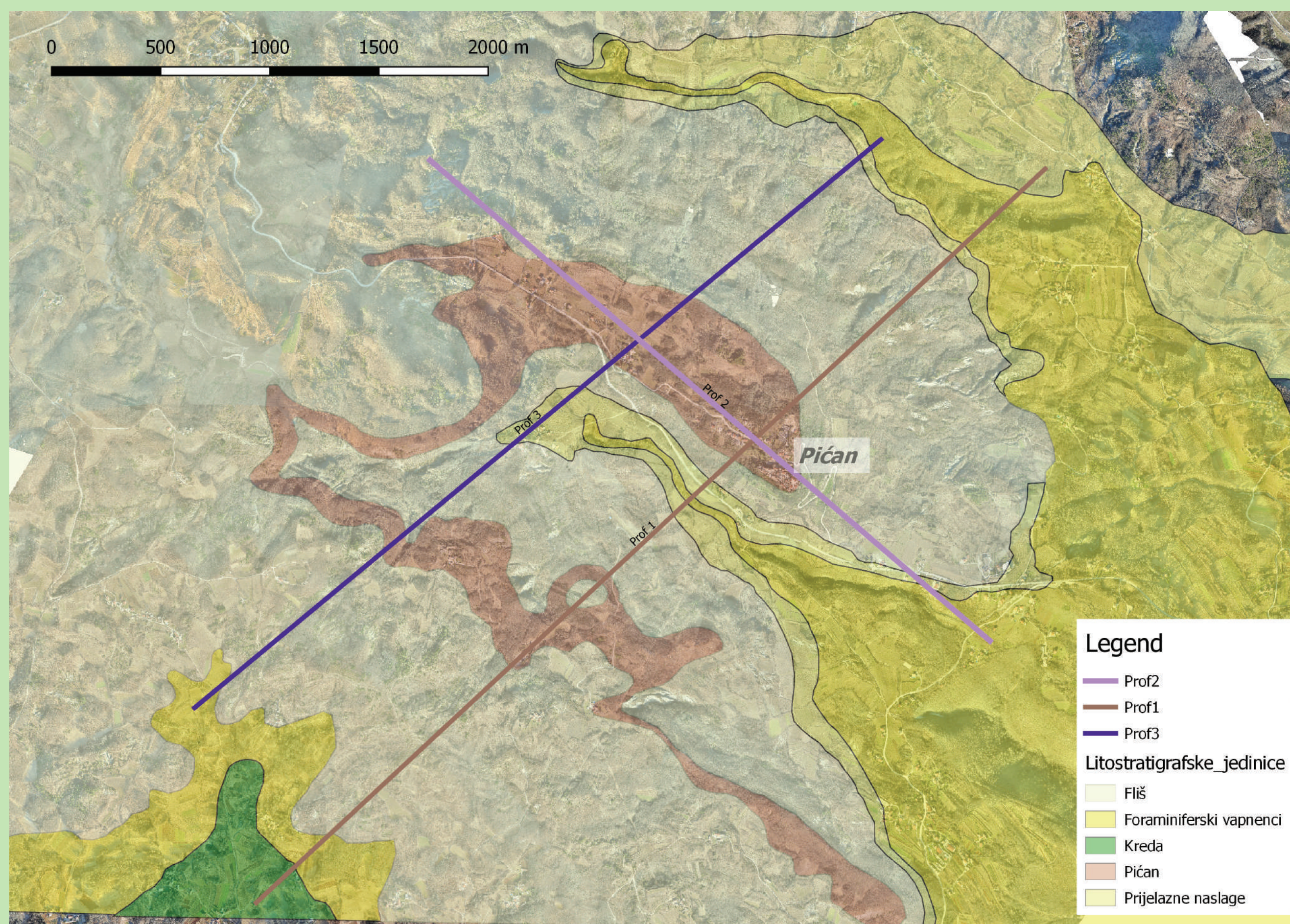
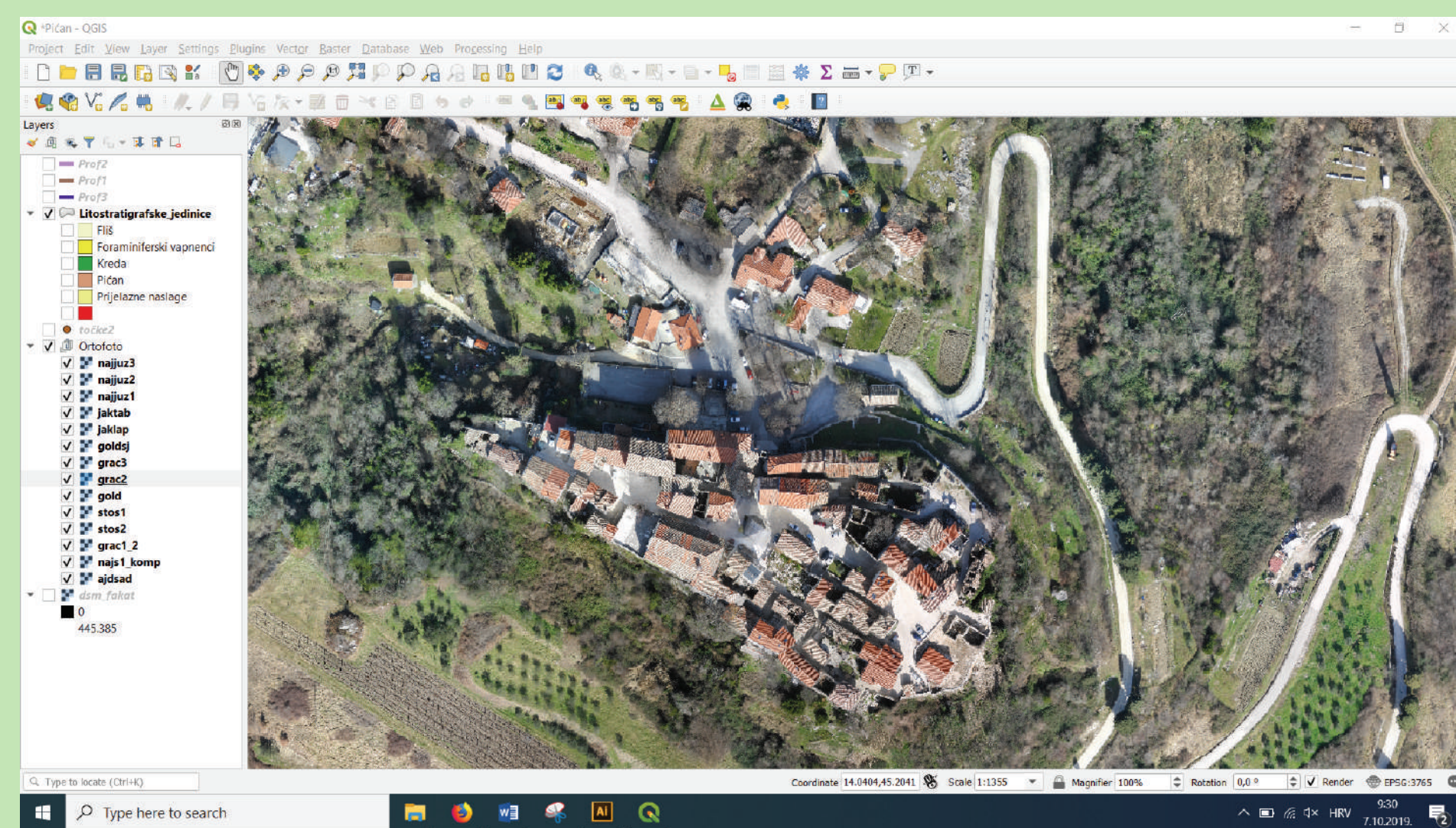
**e-Bee plus** – fixed wing drone by senseFly:

- Wingspan – 110 cm
- Weight (with standard camera & battery) – 1.1 kg
- Material – EPP foam, carbon structure & composite parts
- Battery – 3-cell Lithium-Polymer (0.3 kg)
- Nominal endurance – flight time – 59 minutes - field experience – average of 45 minutes. (vary greatly depending on external factors such as wind, altitude change and temperature)
- Cruise speed 40 – 110 km/h (11 – 30 m/s)
- Wind resistance – up to 12m/s (45 km/h)
- Ground modem range – approx. 3km
- Maximum working range – approx. 8 km

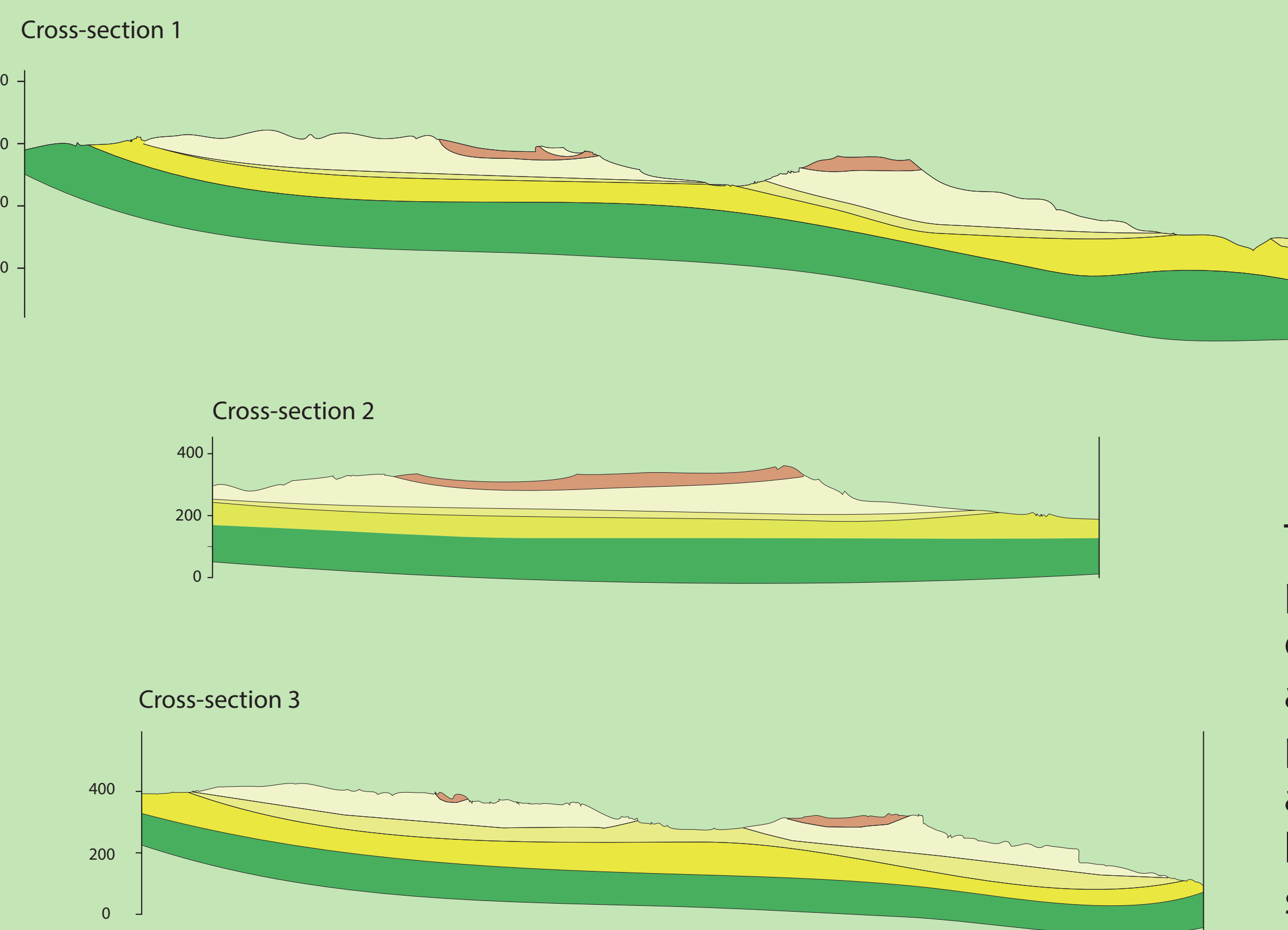
senseFly S.O.D.A. Camera:

- 20 Mpx RGB sensor with 28mm focal lens (focal length fixed)
- 76 grams
- Automatic capture settings optimised for used in drones
- Removable protective lens
- The camera is controlled by the drone's autopilot
- Monitoring the camera thorough eMotion
- Picutre format: JPG / JPG + DNG (raw photos)

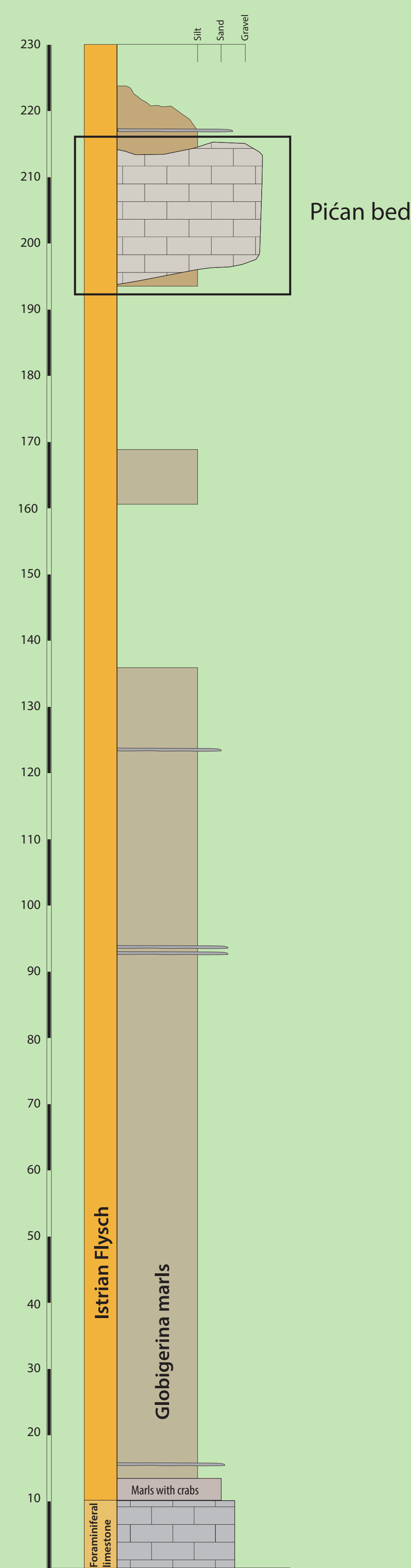
Planning missions and managing eBee plus via eMotion software.  
Processing flight data with photogrammetry software Pix4Dmapper.  
Covering area of around 60 km<sup>2</sup> in 5 days (11 km<sup>2</sup>/day).  
8 batteries, chargers, laptop & power generator.  
Ground sampling distance (GSD) approx. 6 cm.



**Fig. 3** Pićan area geological map

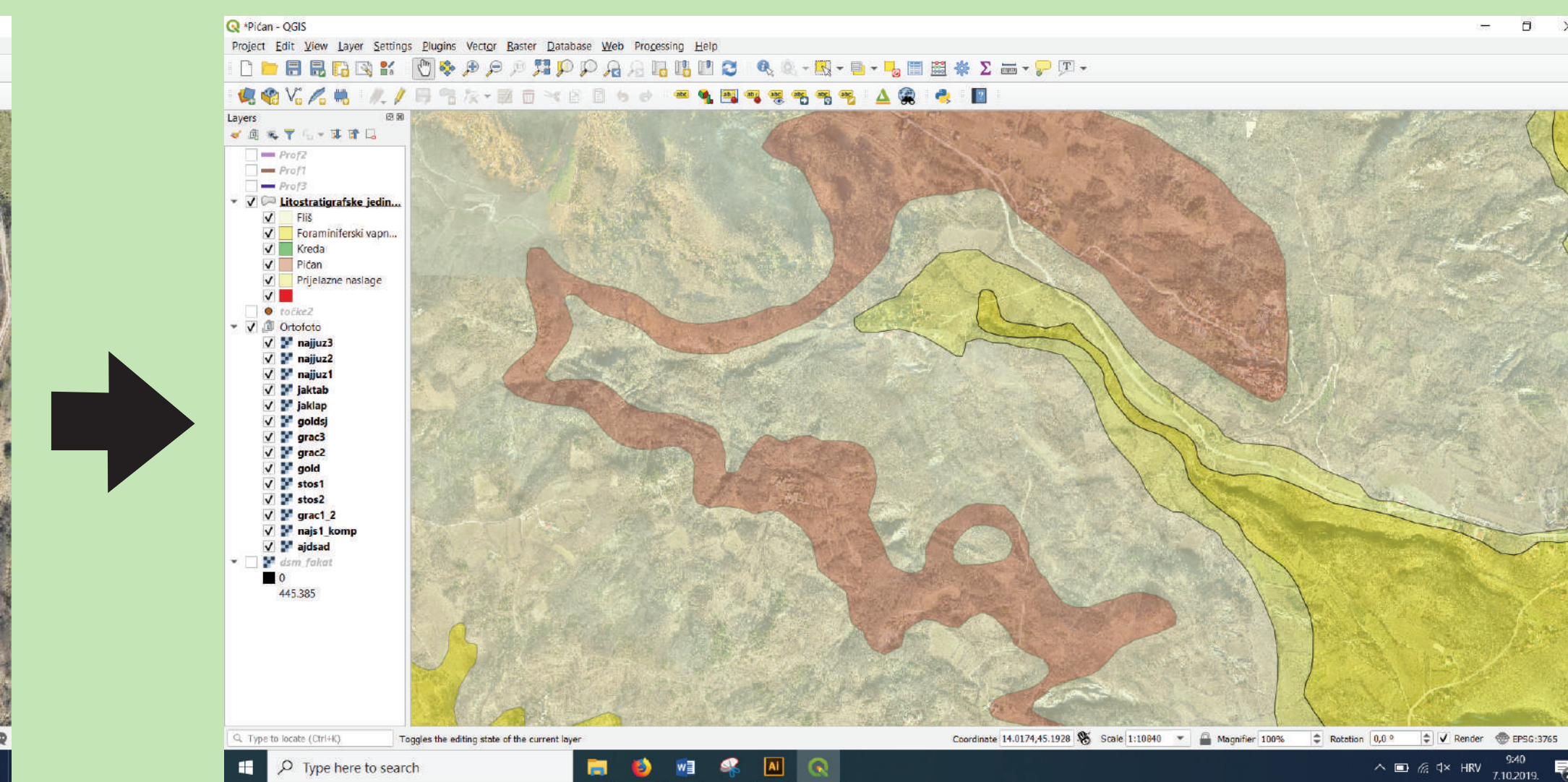


**Fig. 5** Geological cross-sections of Pićan area.

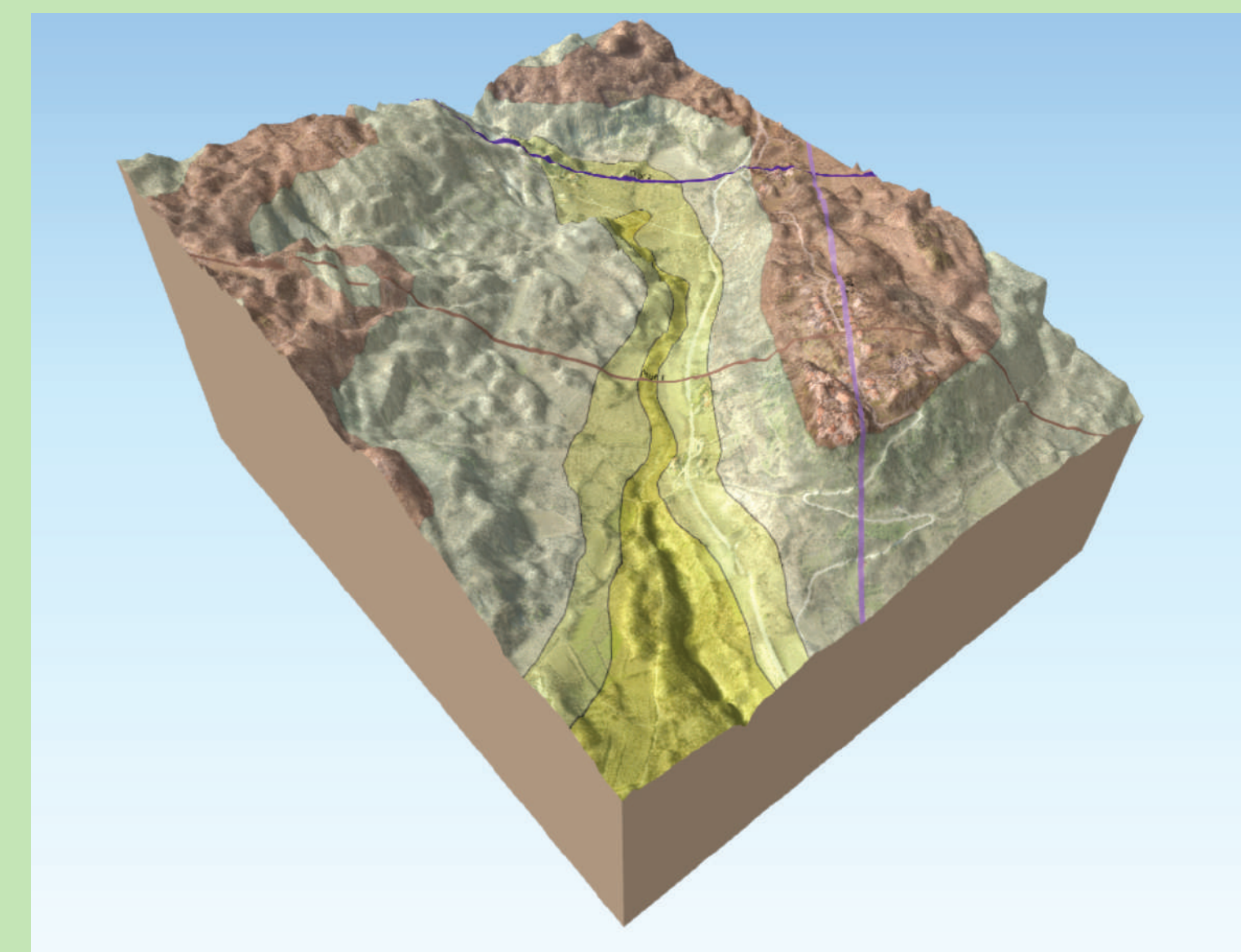


**Fig. 2** Sedimentary log of the Pićan area.

The geological model of the Pićan area was built based primarily on the lithostratigraphic map and geological cross-sections, and the Digital Surface Model (DSM) of the area. The data were modelled using Quantum GIS, and plug-ins for creating geological cross-sections (qProf), and 3D visualization (Qgis2threejs). The new lithostratigraphic map together with other available data, such as Digital Orthophoto Images of the area were used to construct a series of geological cross-sections needed for the model, while an Unmanned Aerial Vehicle (UAV) was used to record the DSM of the area.



**Fig. 6** The process of creating geological map and cross-sections based on Ortho Photo images and photogrammetrically created DSM (Digital Surface Model), and 3D view using Qgis2threejs.



Finally, the geological model of the Pićan area displays, faithfully as possible, the spatial distribution of the “Pićan bed” and the interesting geological setting of the Pićan area, Istria.



#### ACKNOWLEDGEMENTS:

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