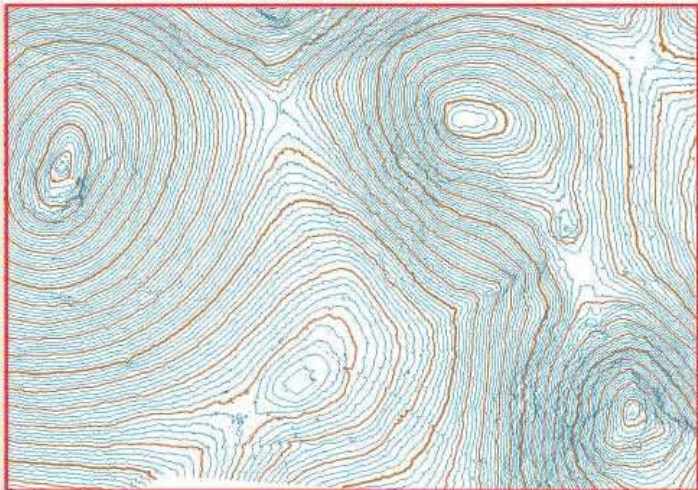
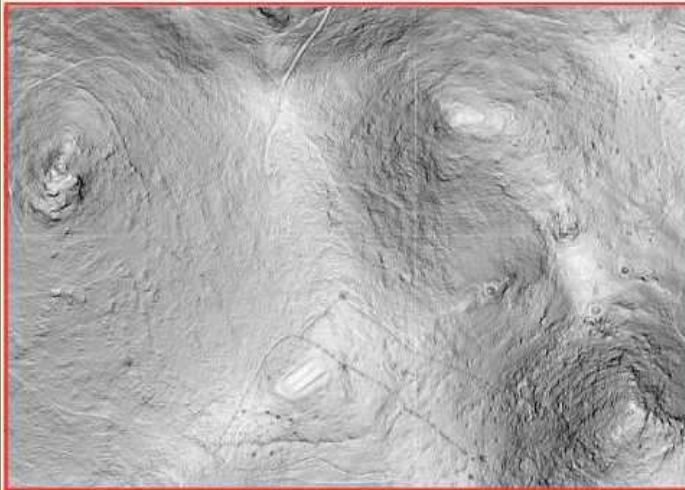


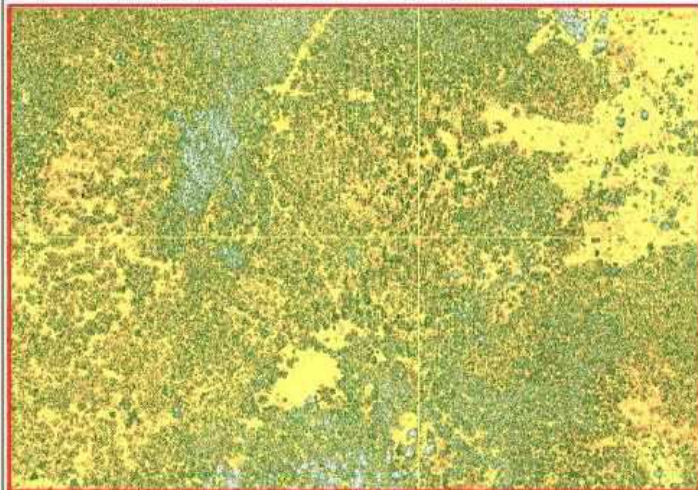
lidar szintvonalak



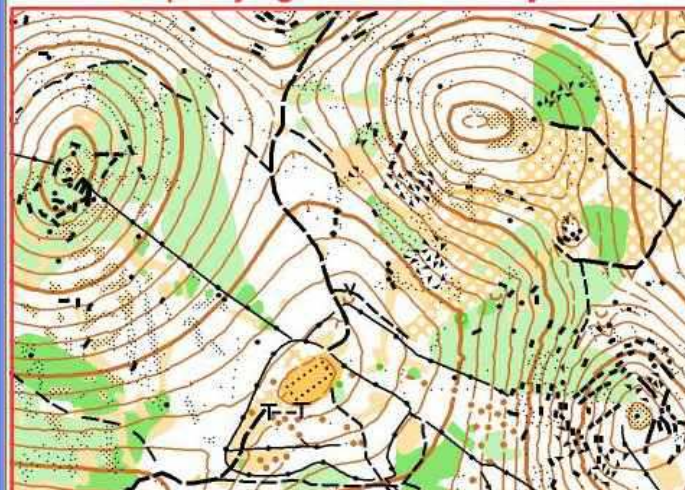
lidar árnyékos domborzat



lidar növényzet



lidar alapanyagból készült tájfutó



Erdélyi Tibor
2017. Január 14.

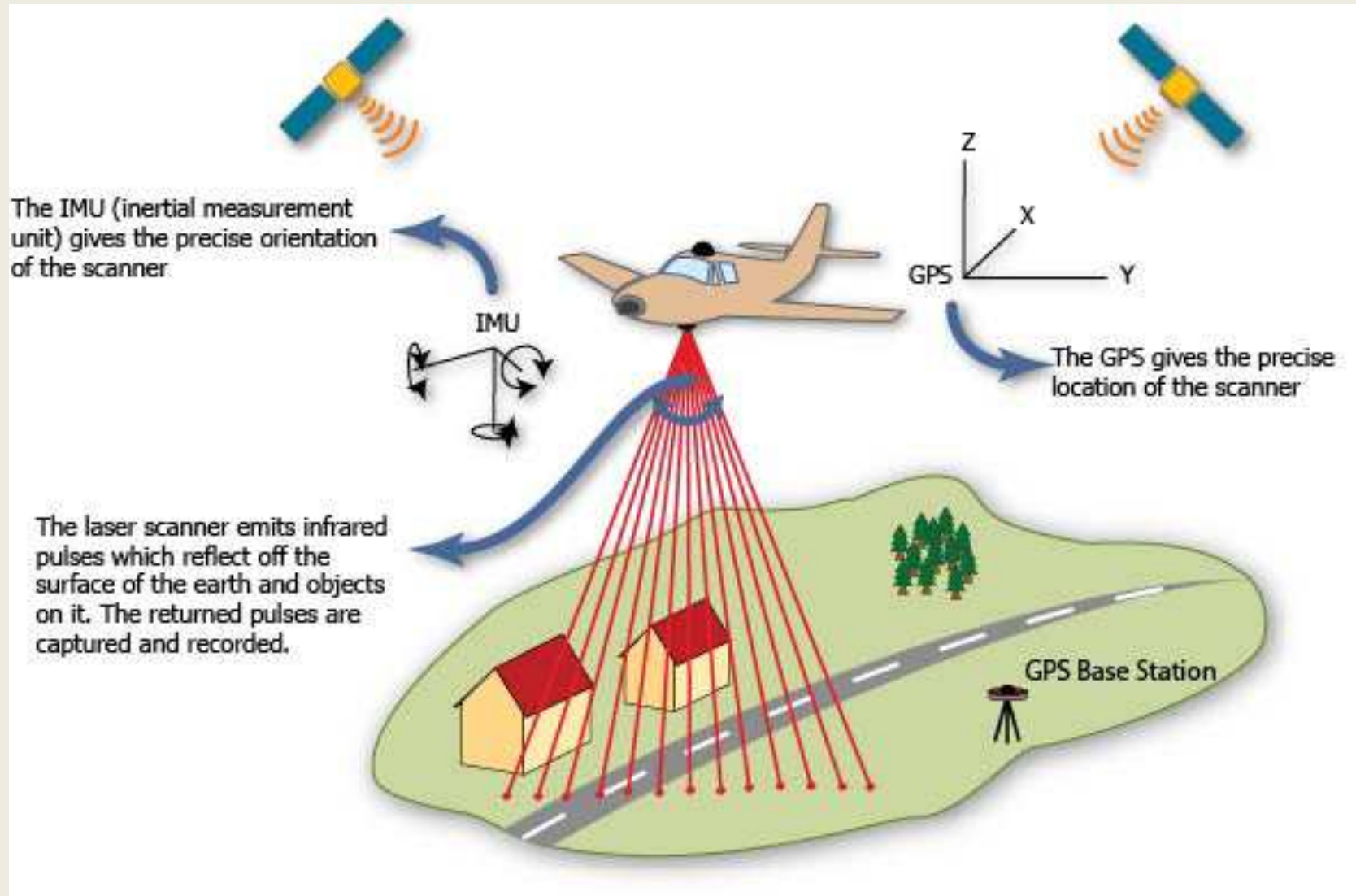
Légi lézerszkennelt adatok használata a
tájfutó térképezésben



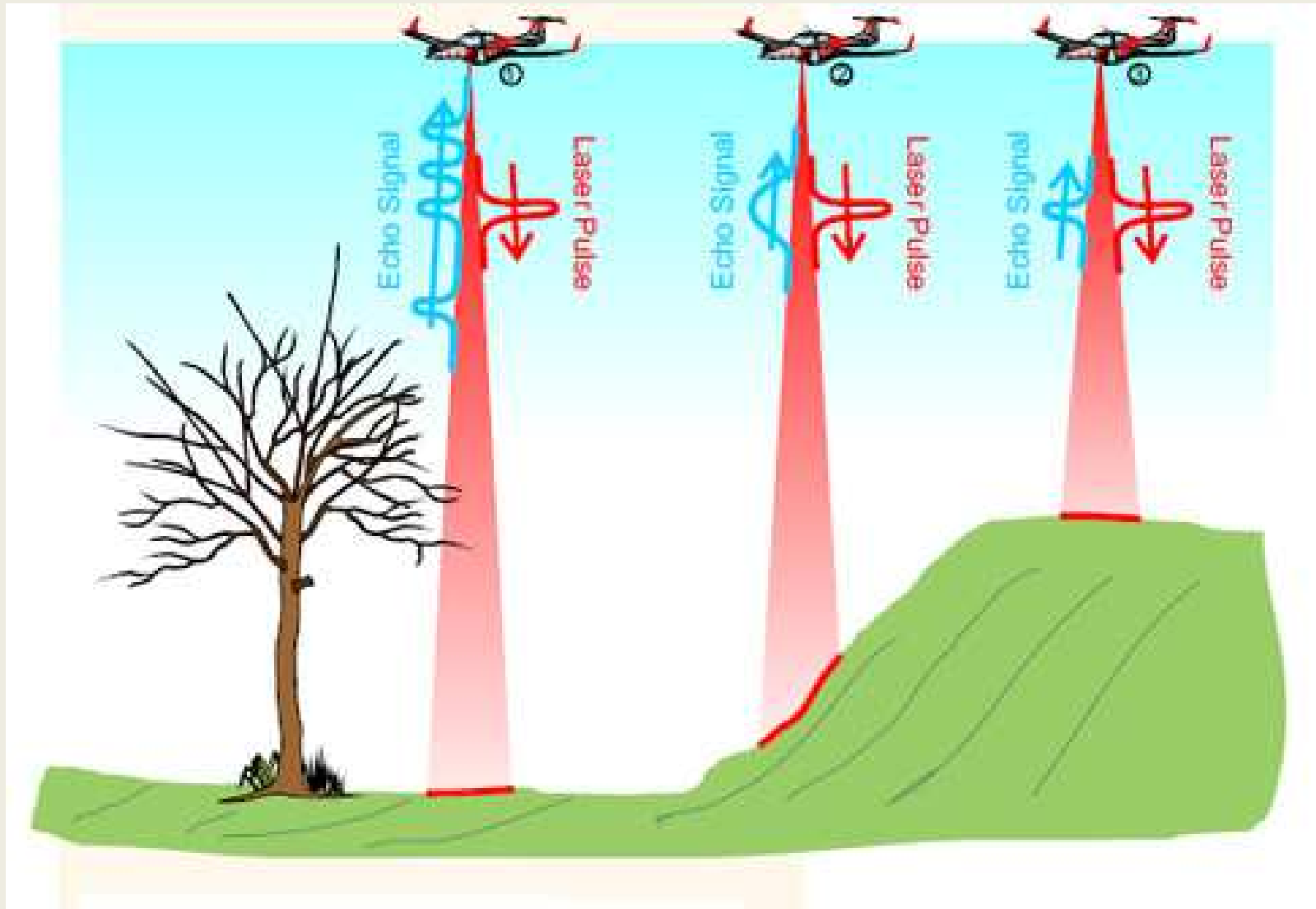
traditional photogrammetry



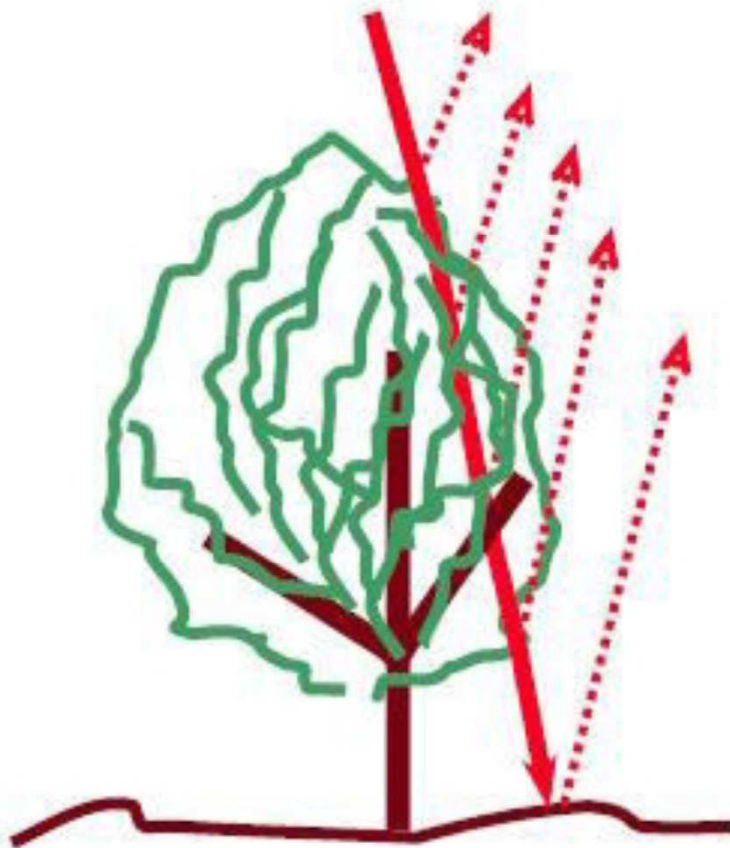
ALS Airborne Laser Scanning



The reflected signal form is also important information



Vegetation: multiple reflections



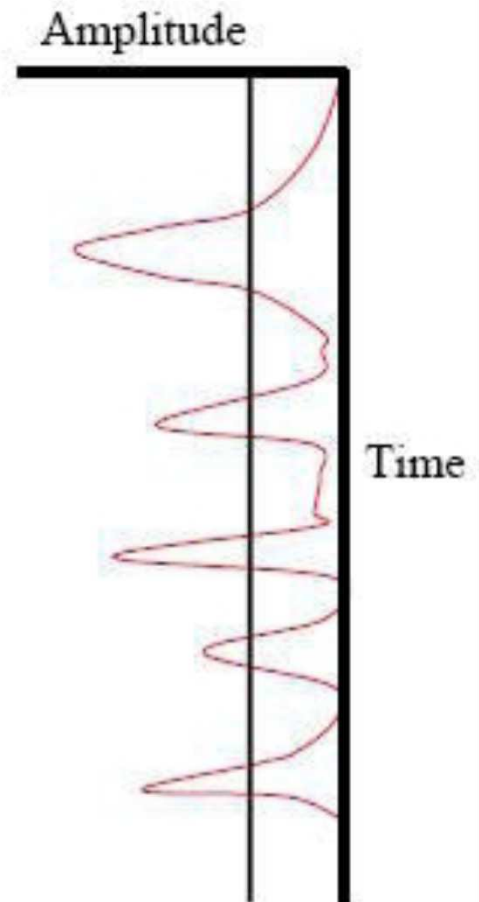
First return

Second return

Third return

Fourth return

Last return



DEM: Digital Elevation Modell

DSM: Digital Surface Model

DTM: Digital Terrain Model

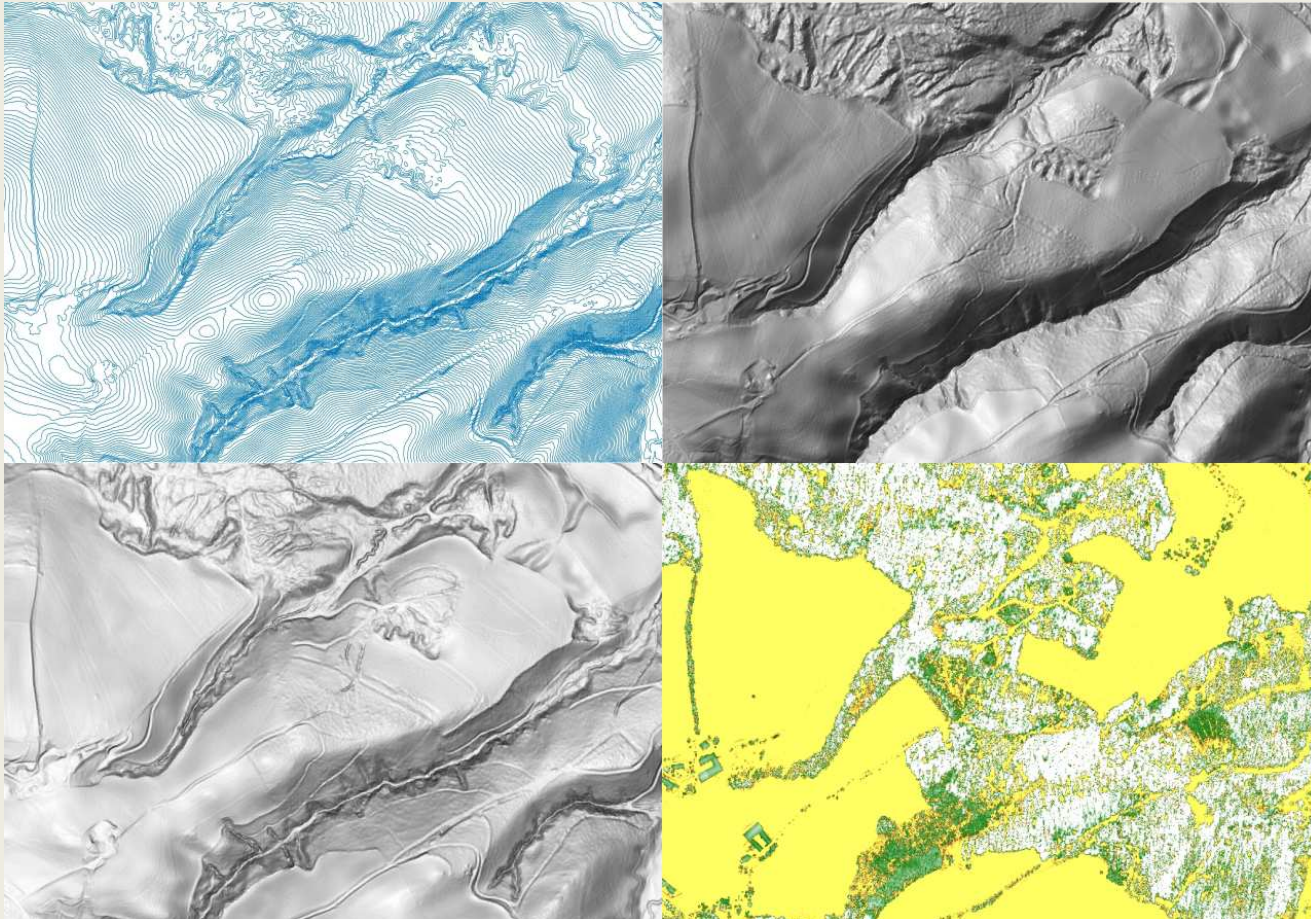


Kirchberg, Austria

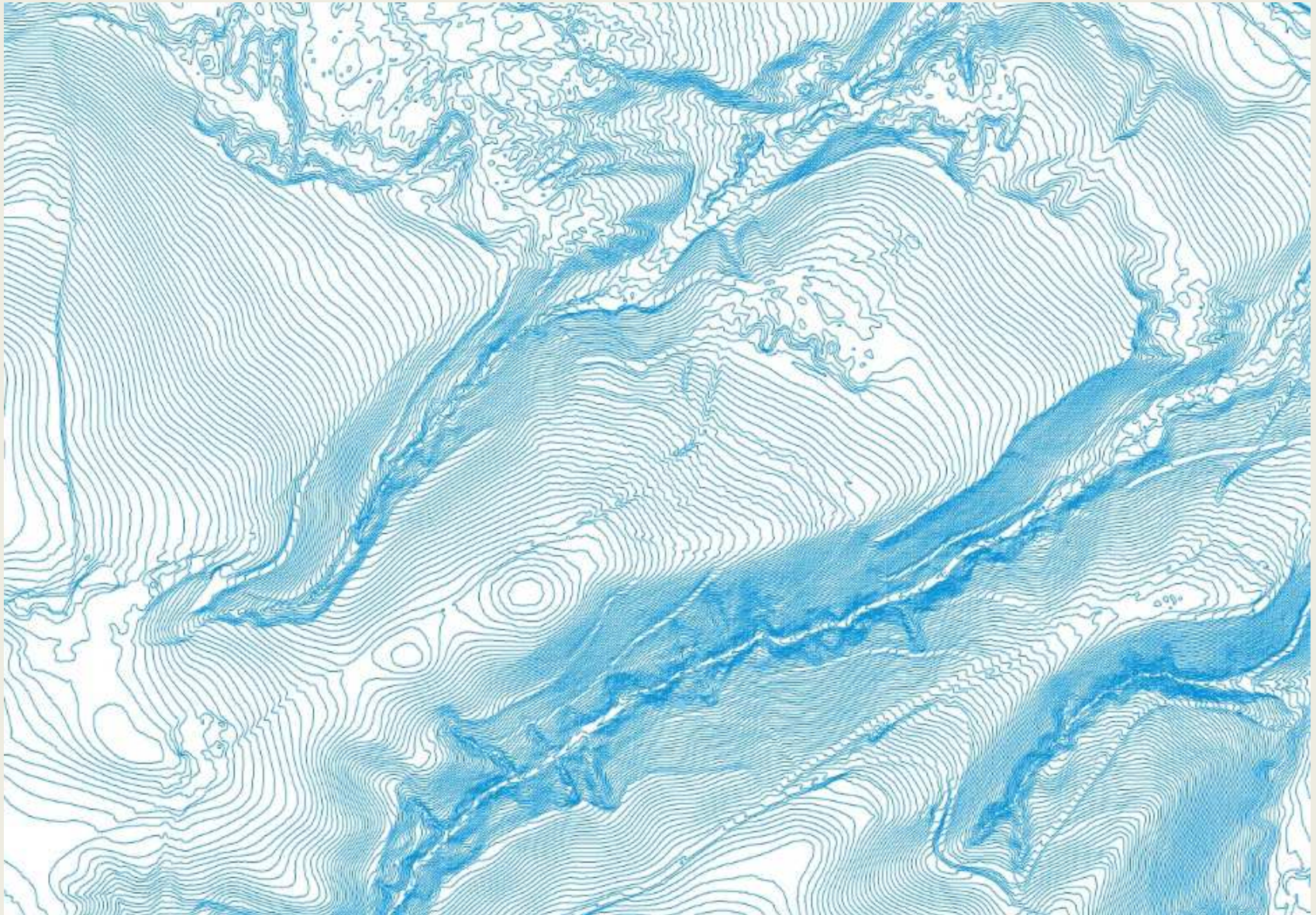
Contours, as many meters you like

Halftone images showing the elevation

Vegetation



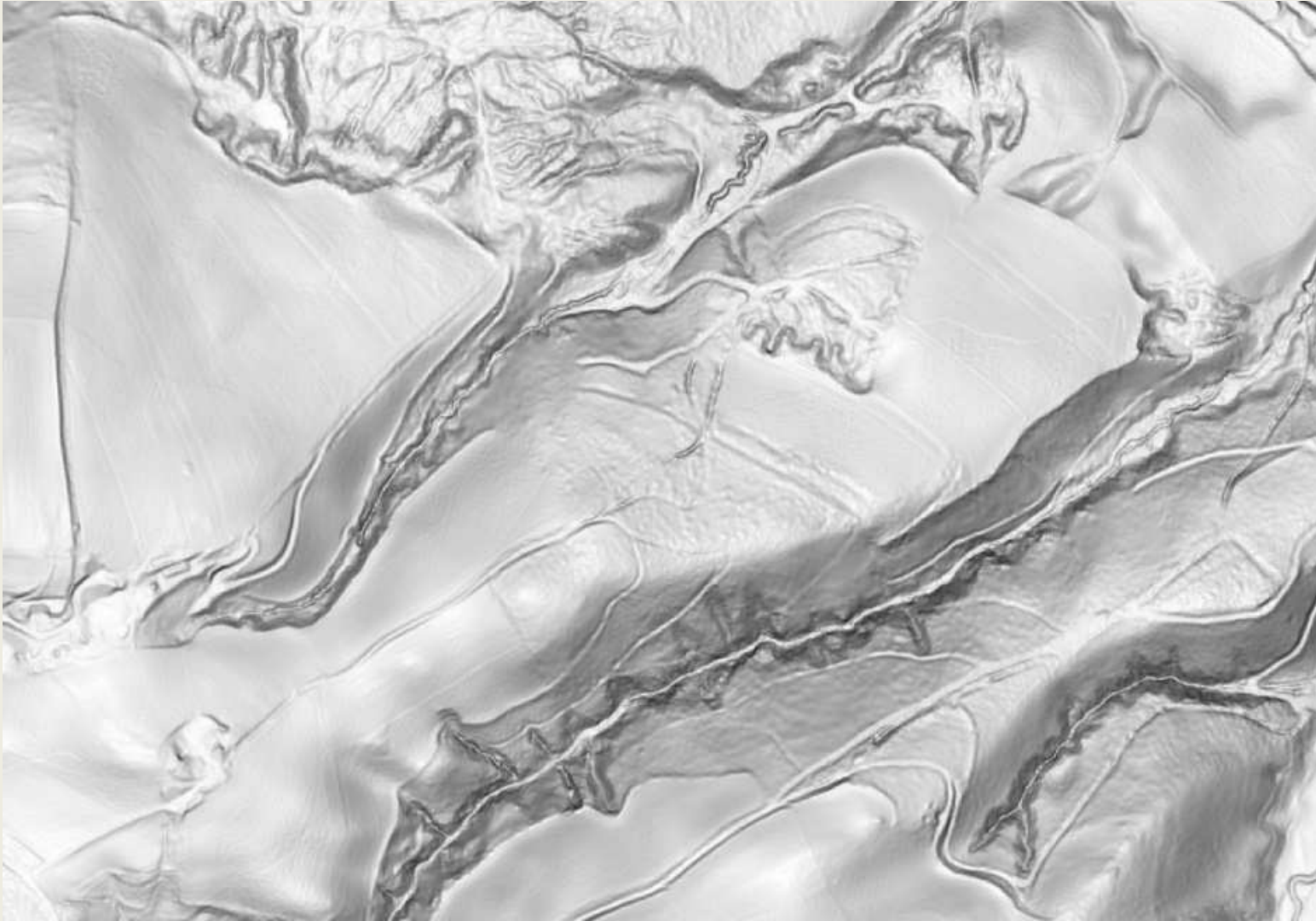
Contours (1m)



Hill Shading



Slope Gradient

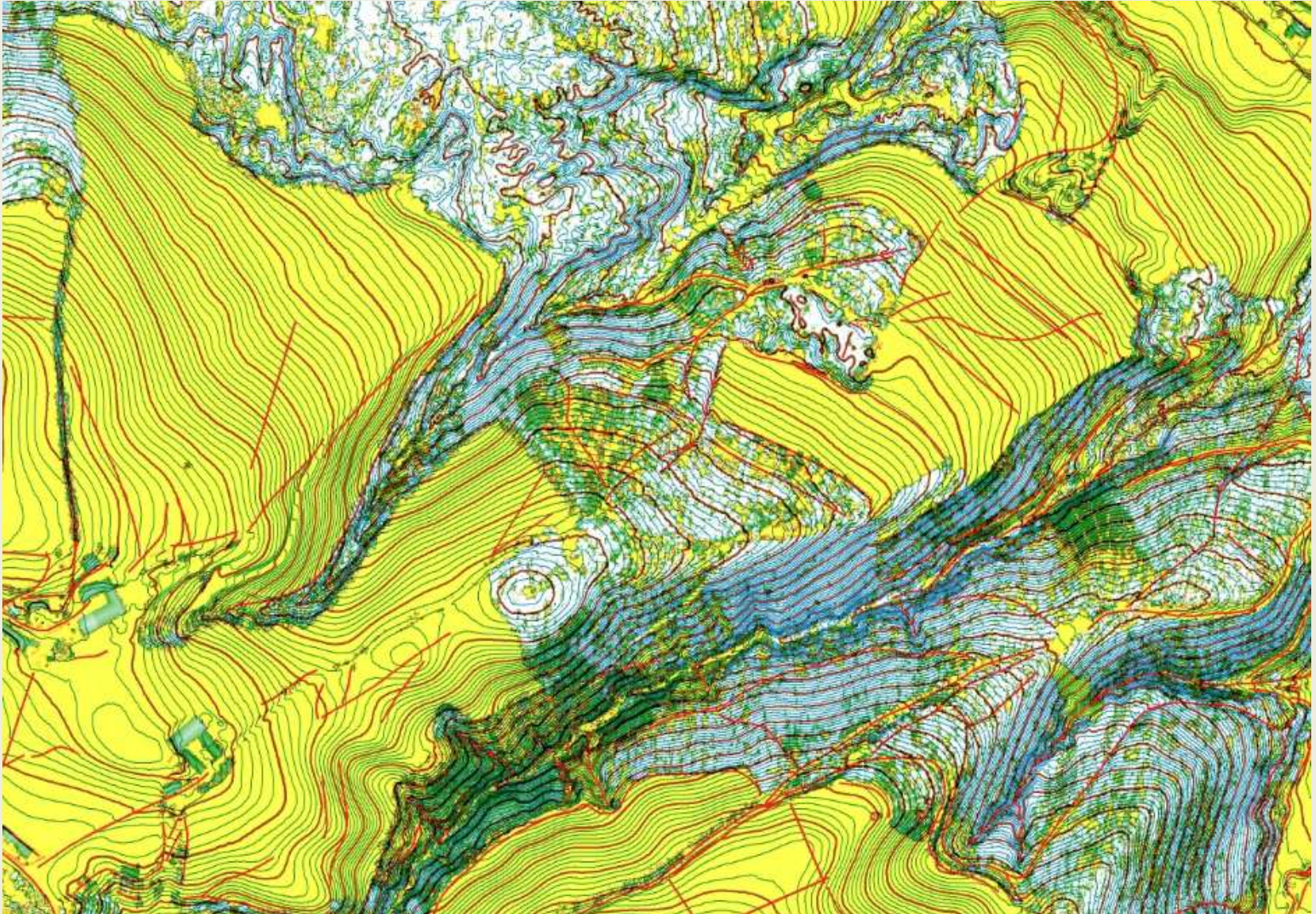


Vegetation

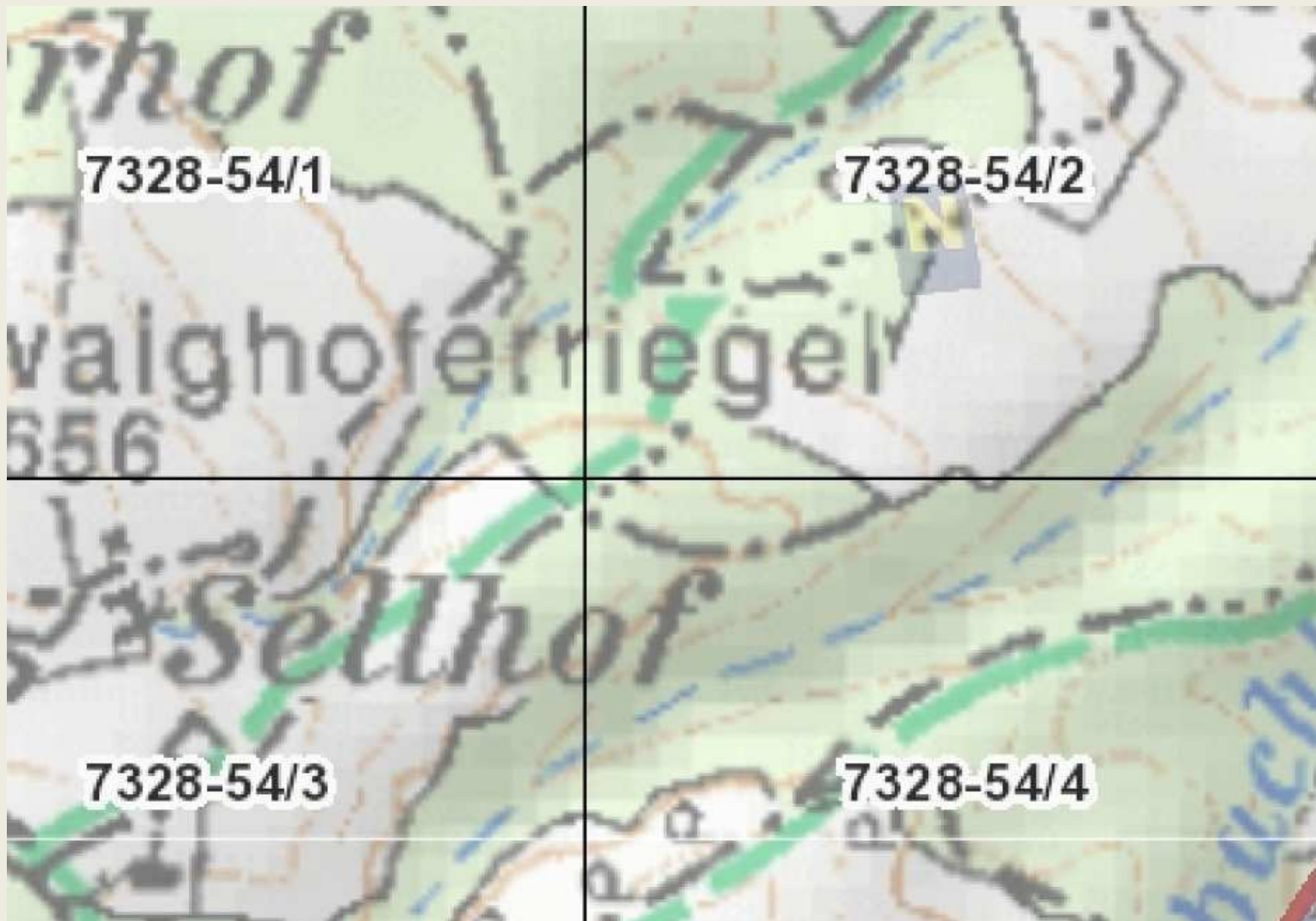




Fieldwork motherboard

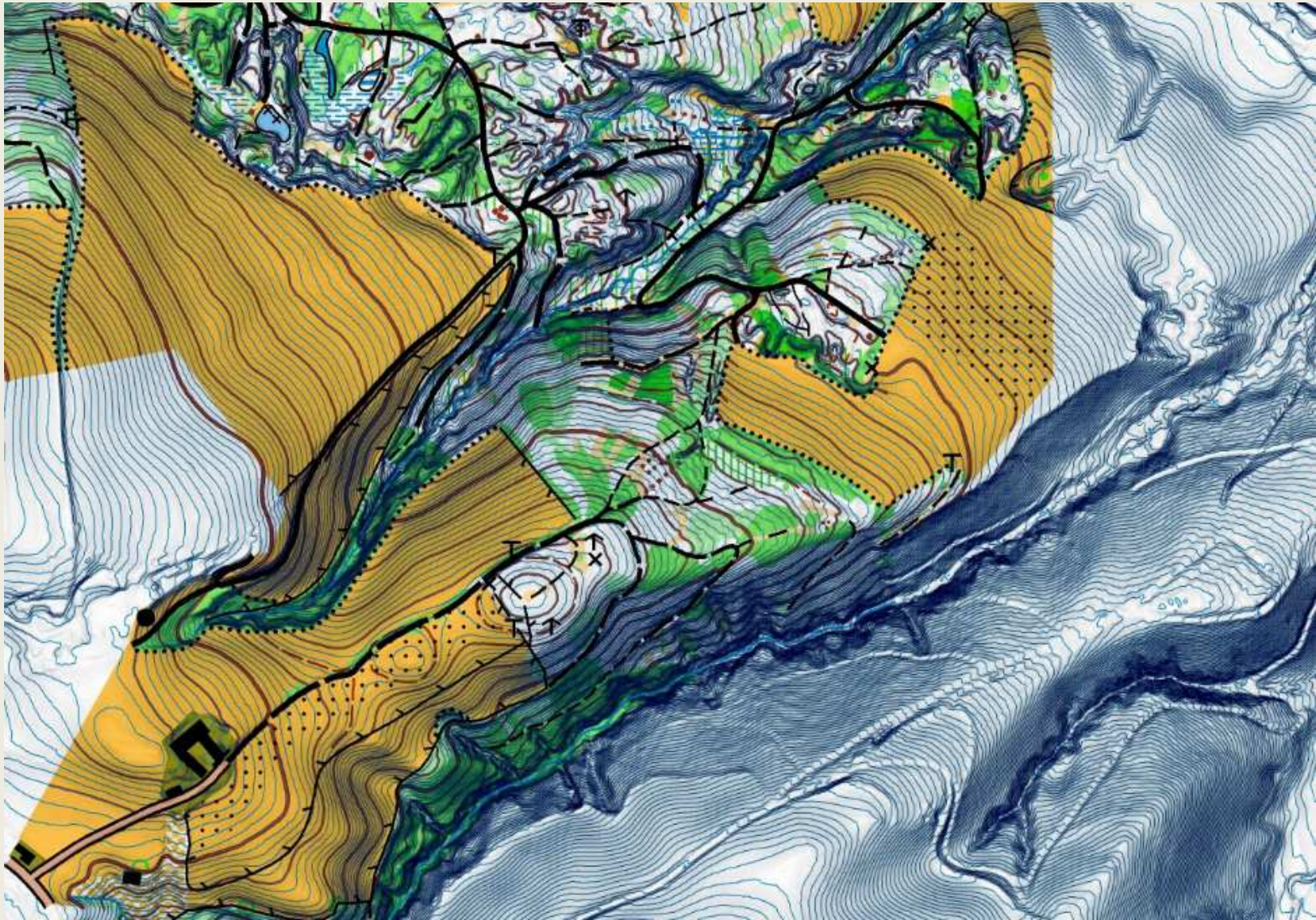


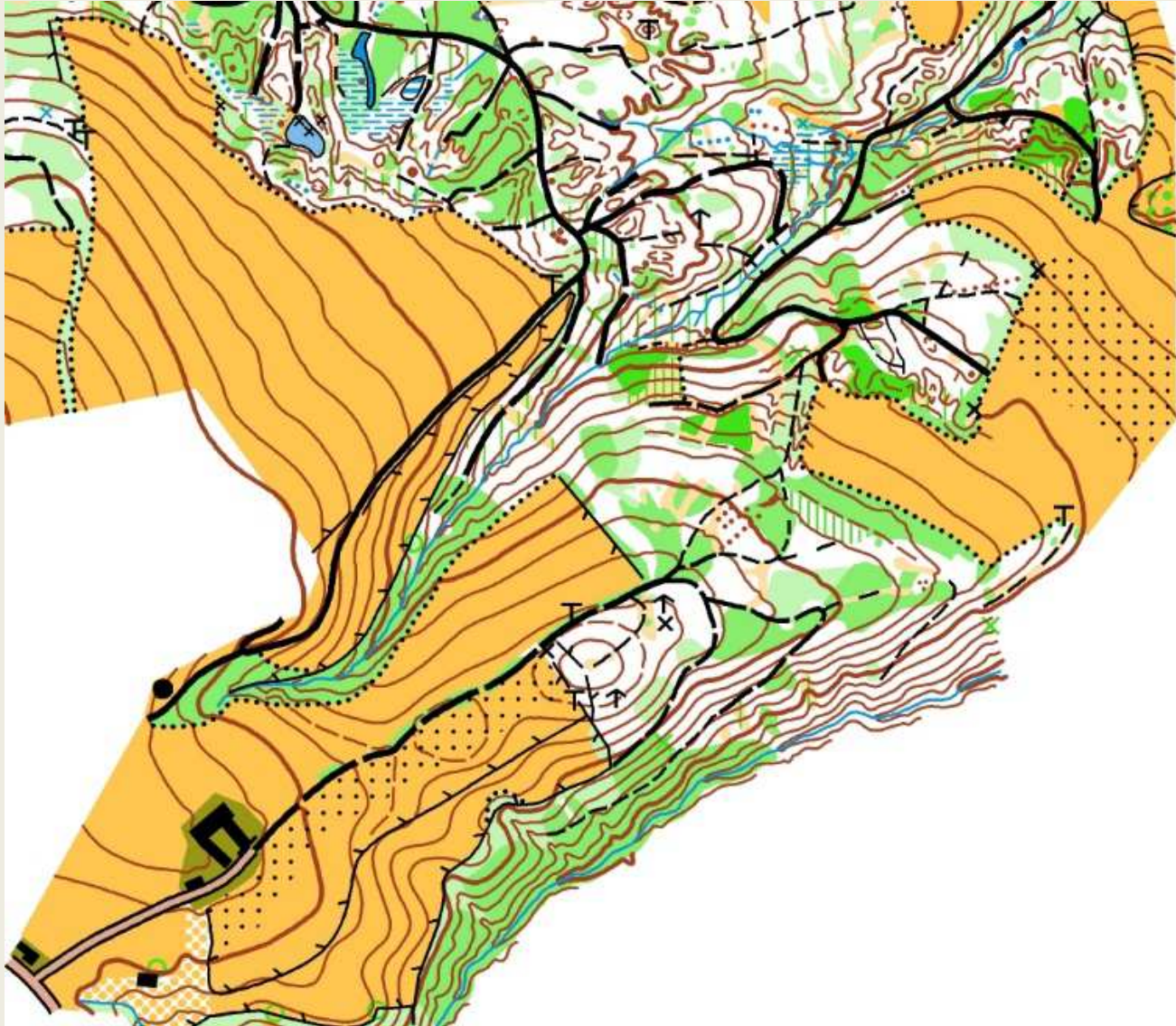
Which kind of basic maps was here eight years ago? 1. Topographic map



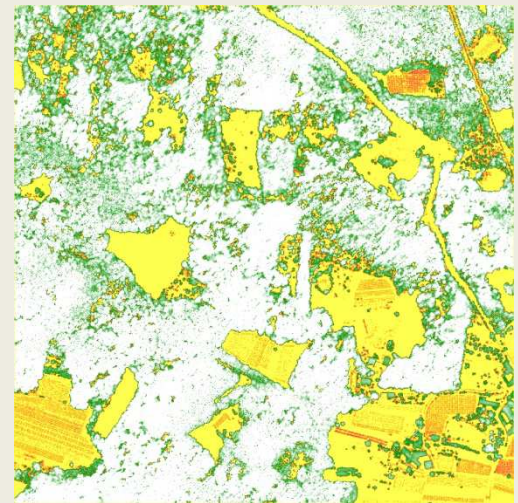
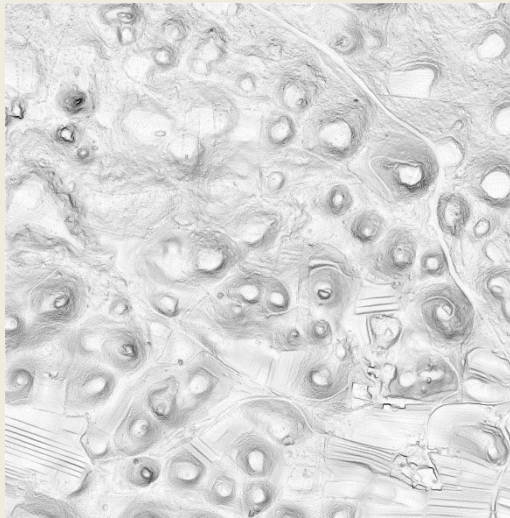
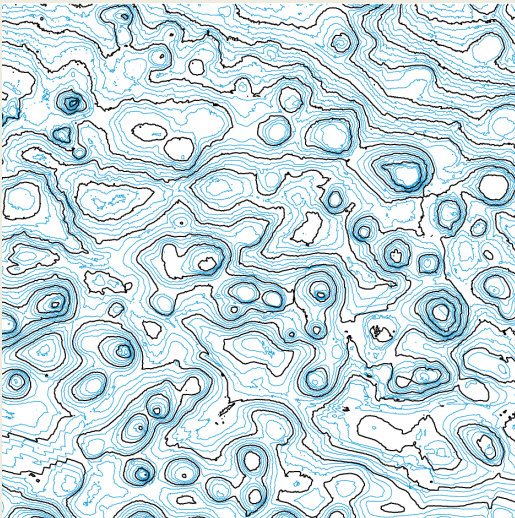
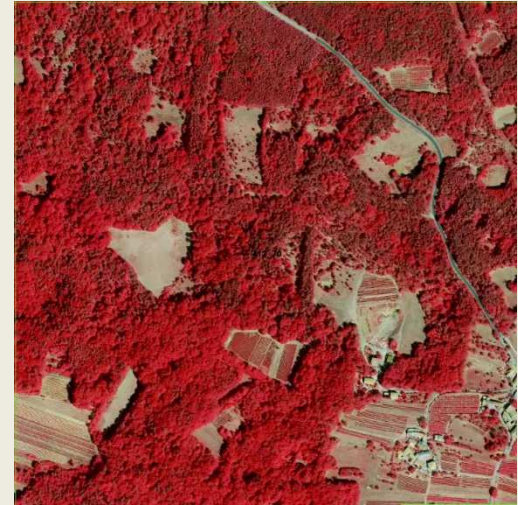
2. Orthophoto and cadastral map





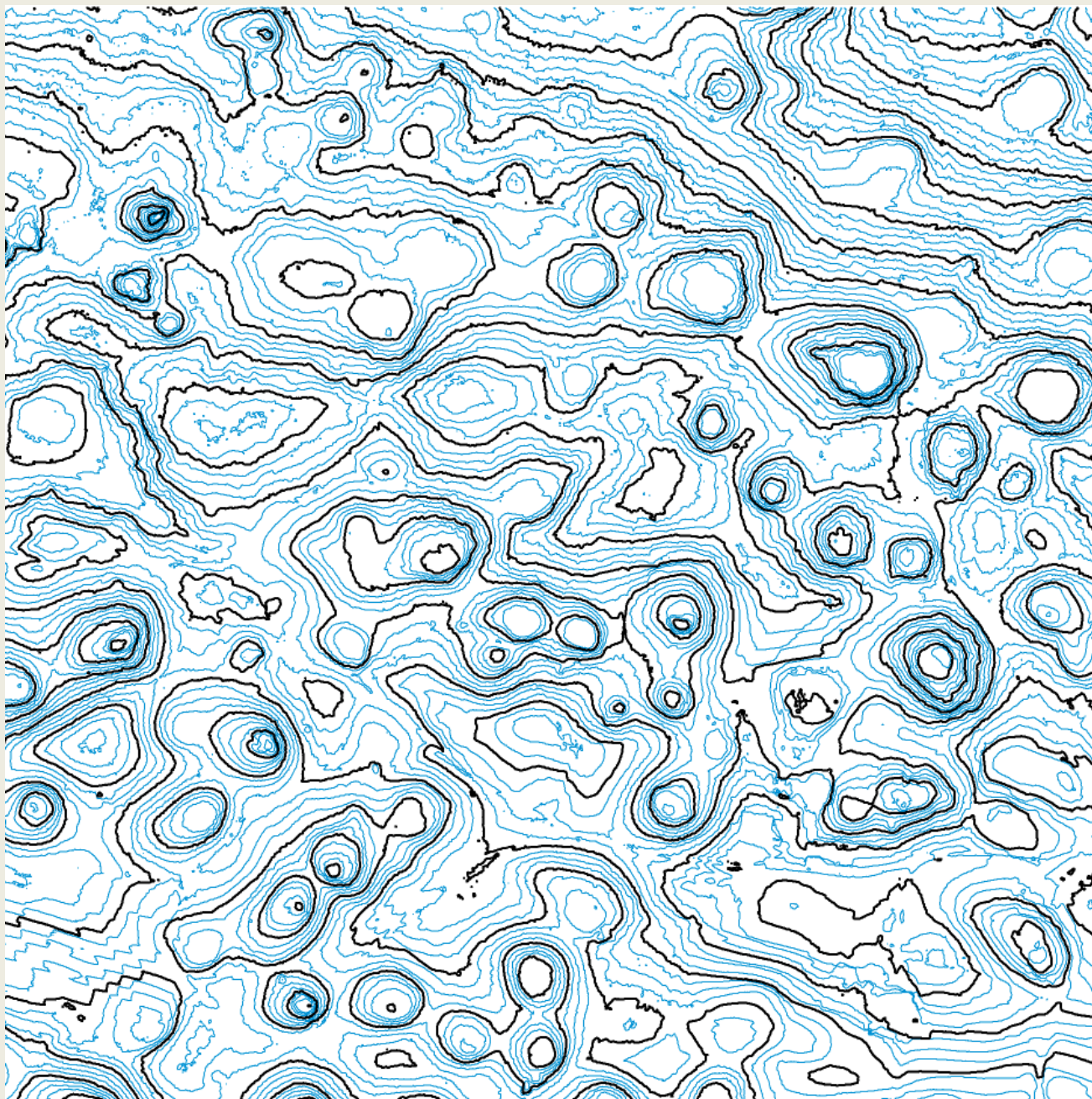


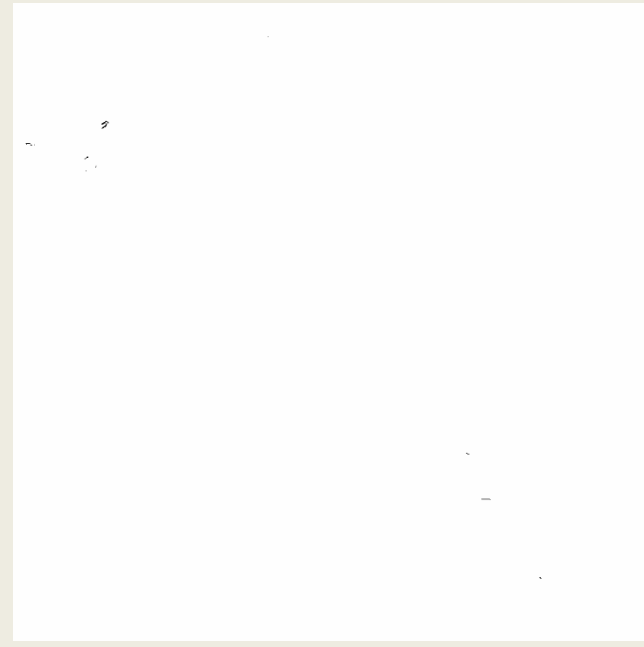
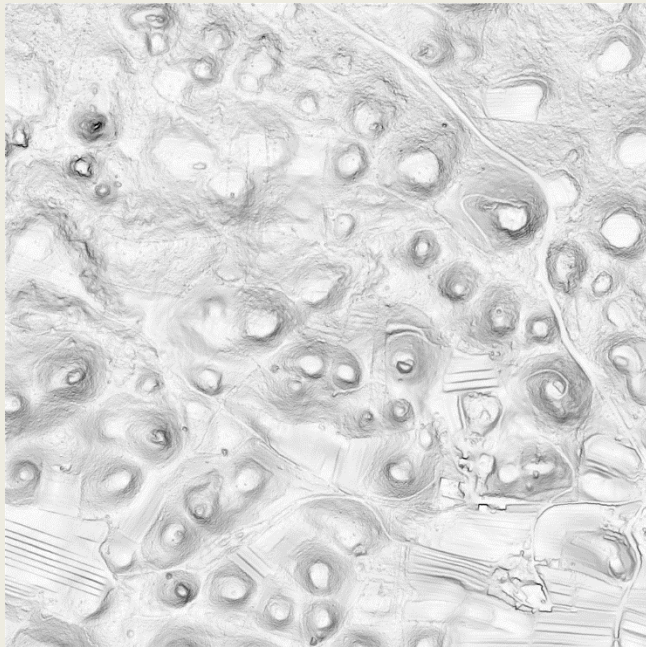
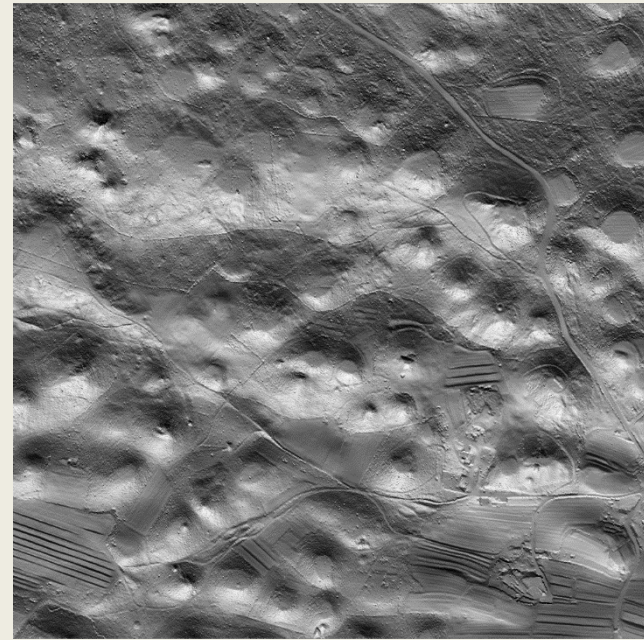
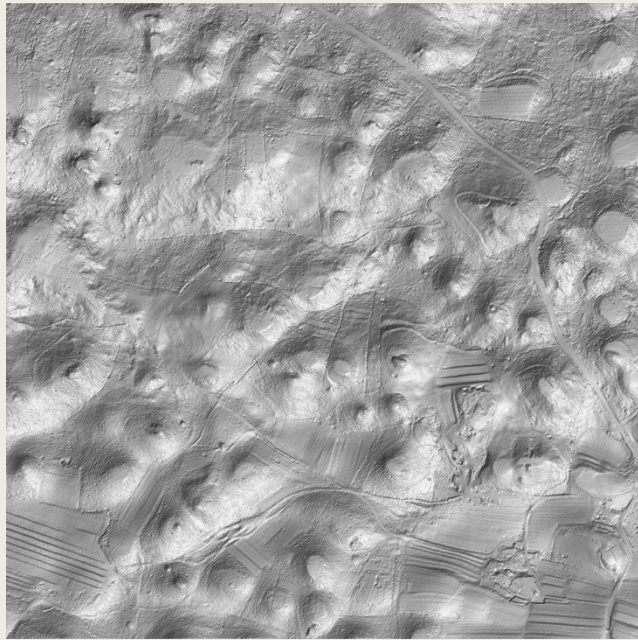
Slovenia, karst terrain

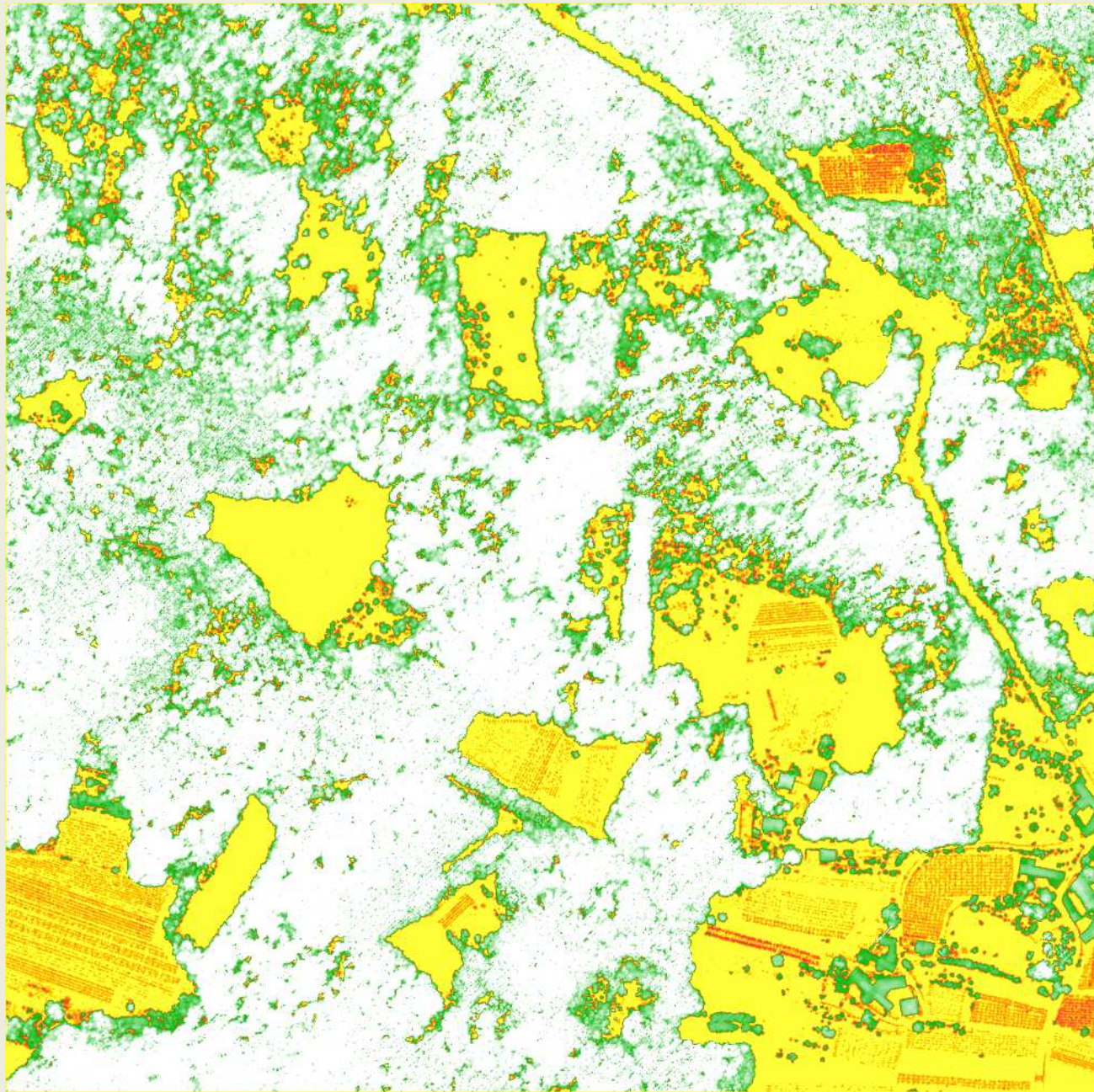


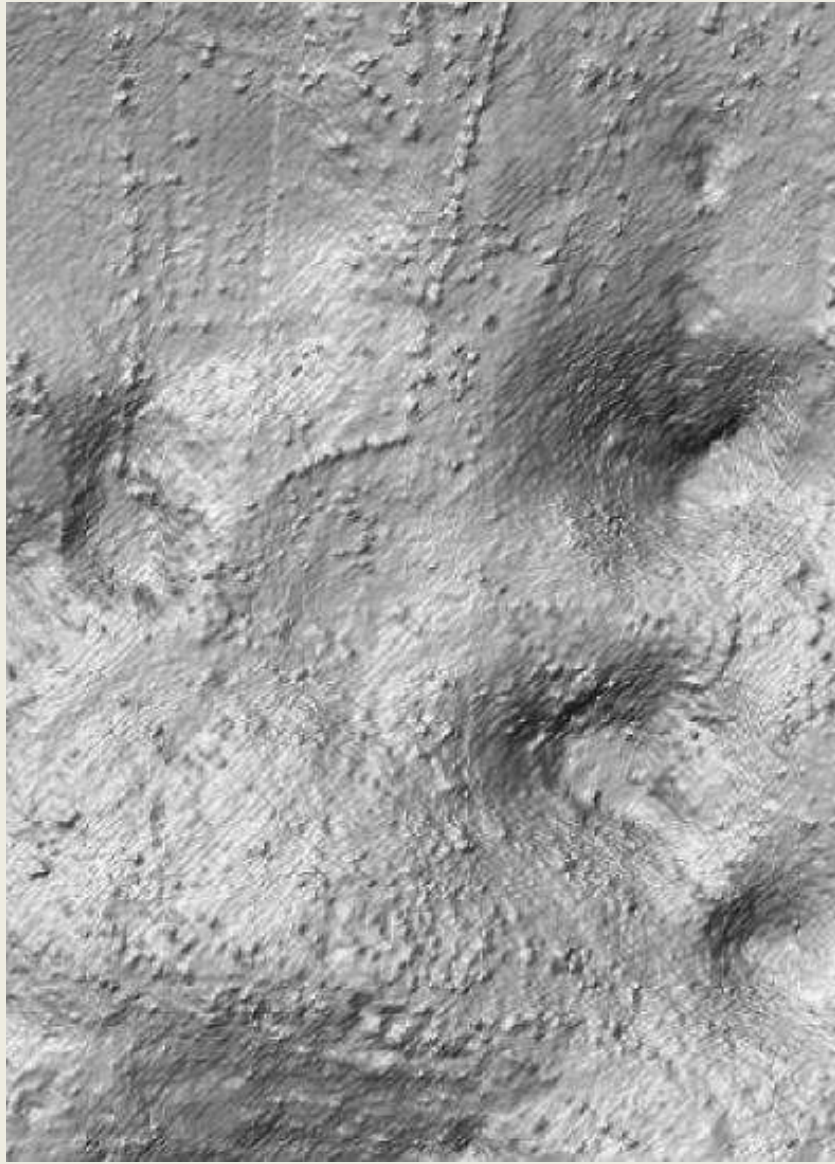


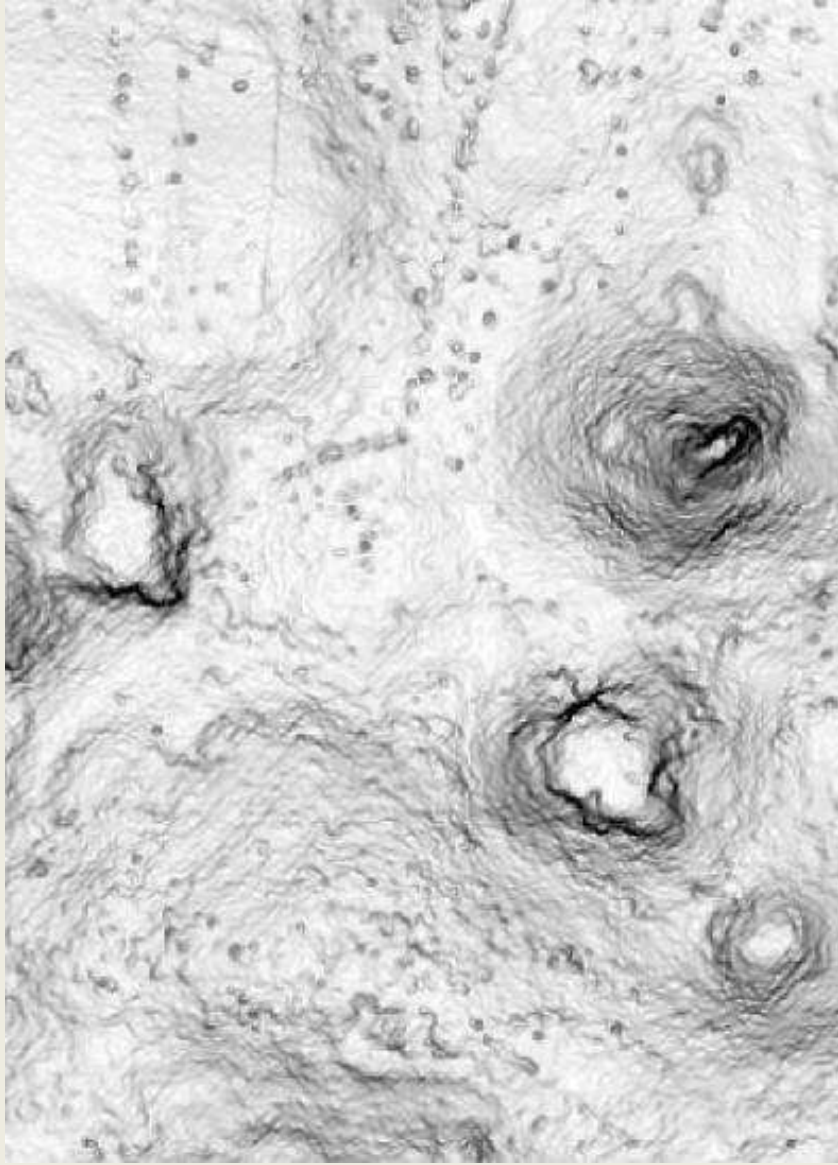


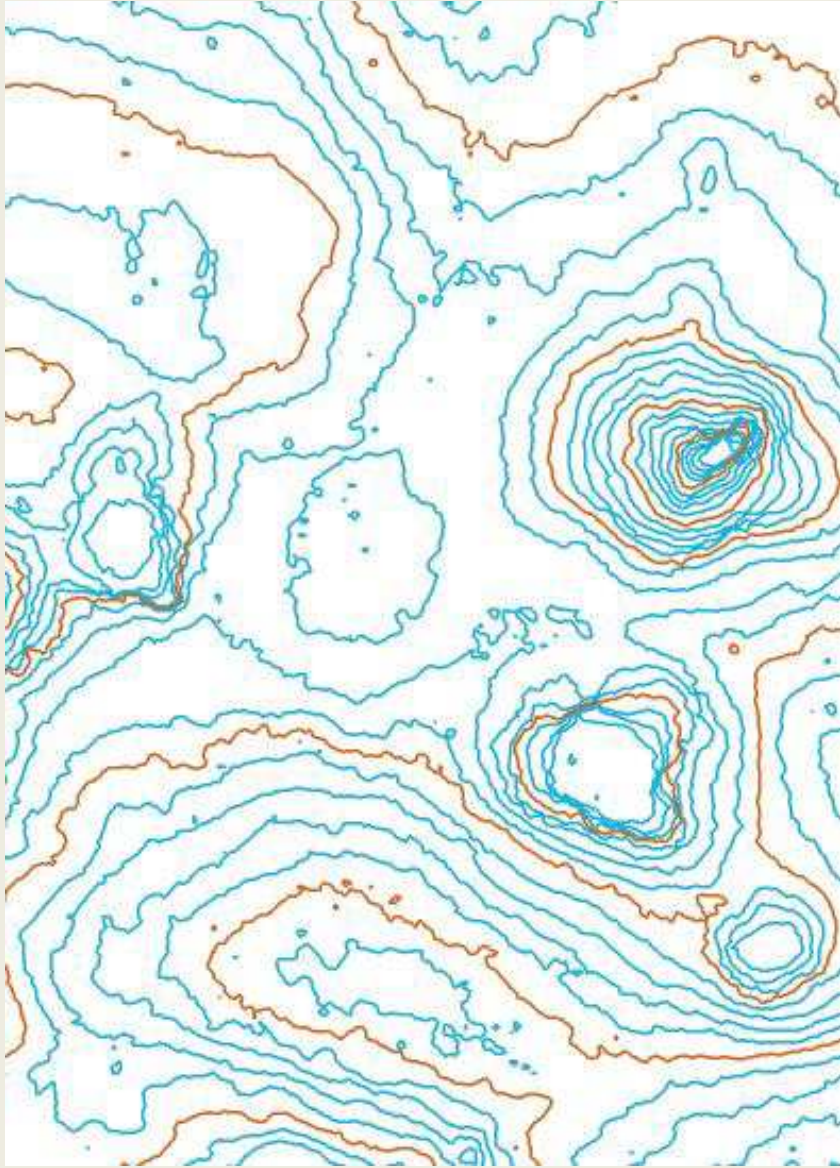












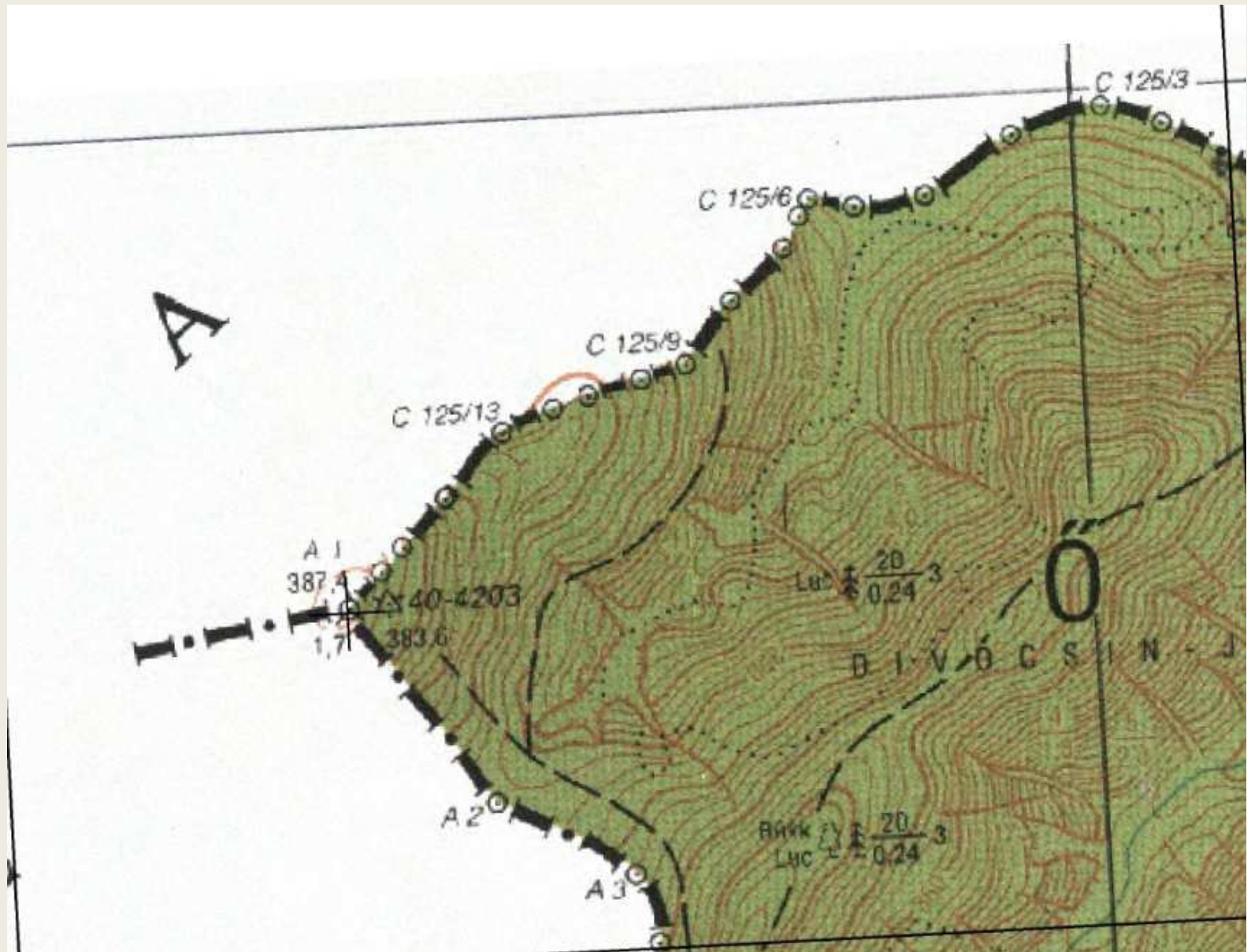




Western corner of Hungary, at the triple border



Hungarian topographic map, 1961!



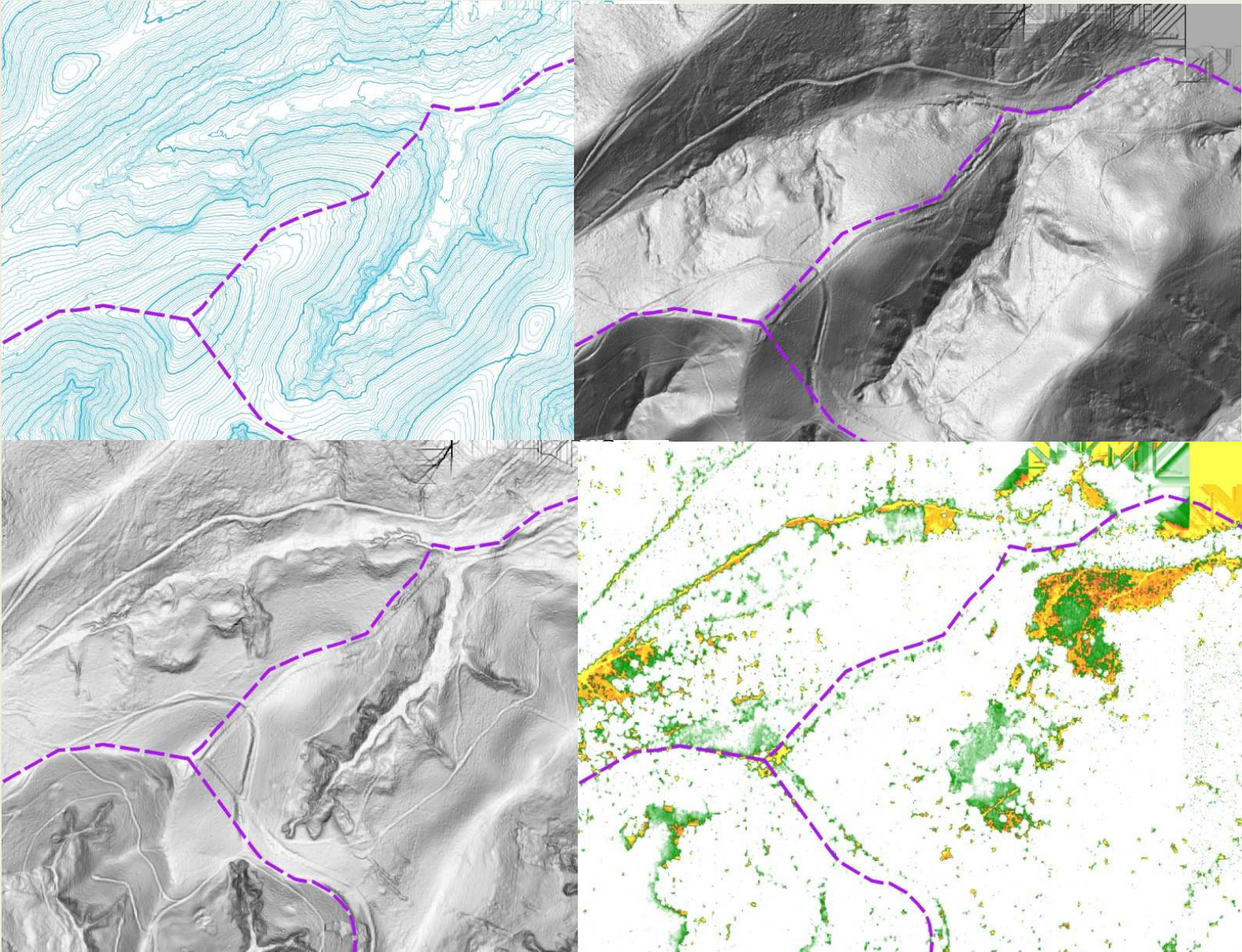
Orthofoto, 2005.

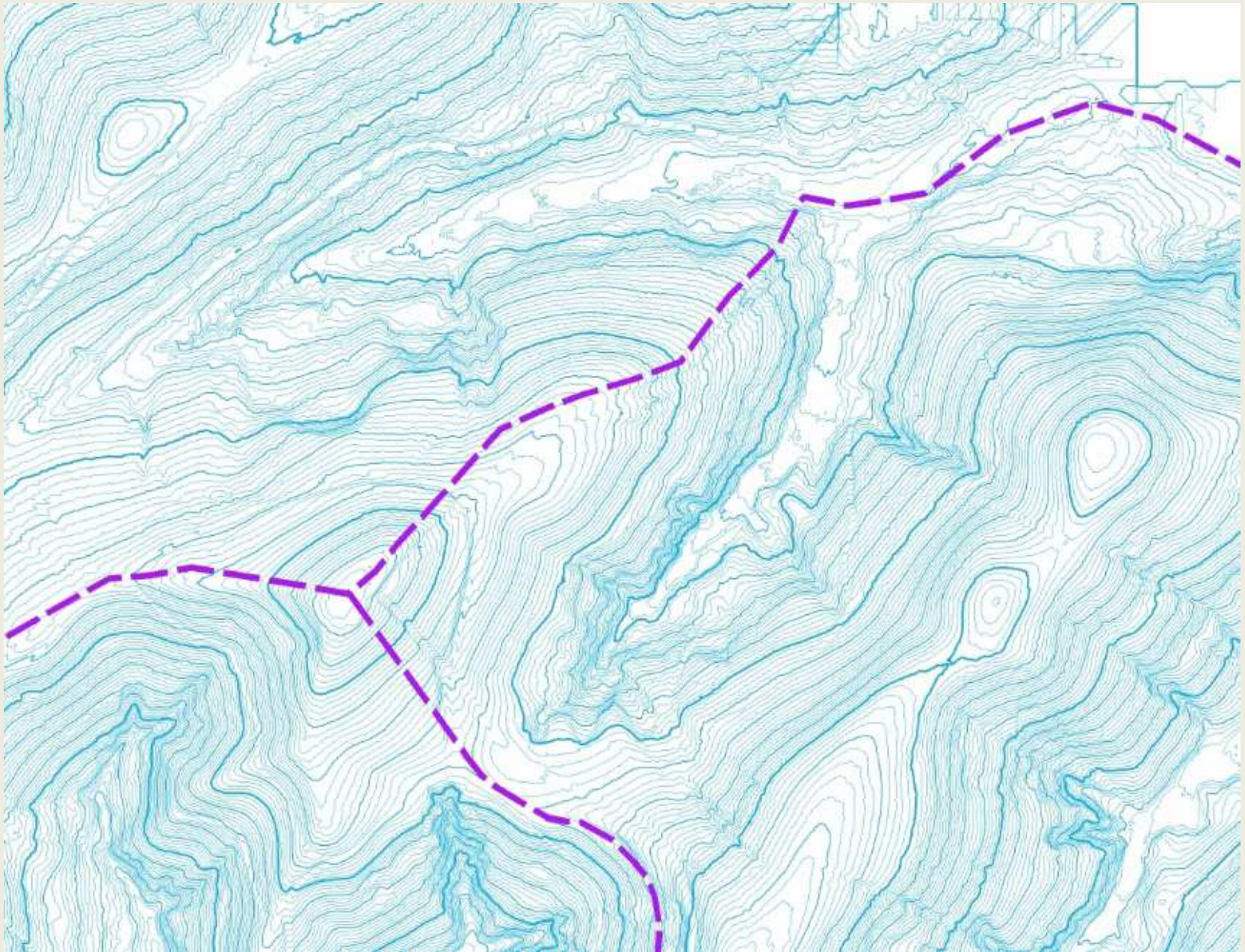


Google maps 2012.

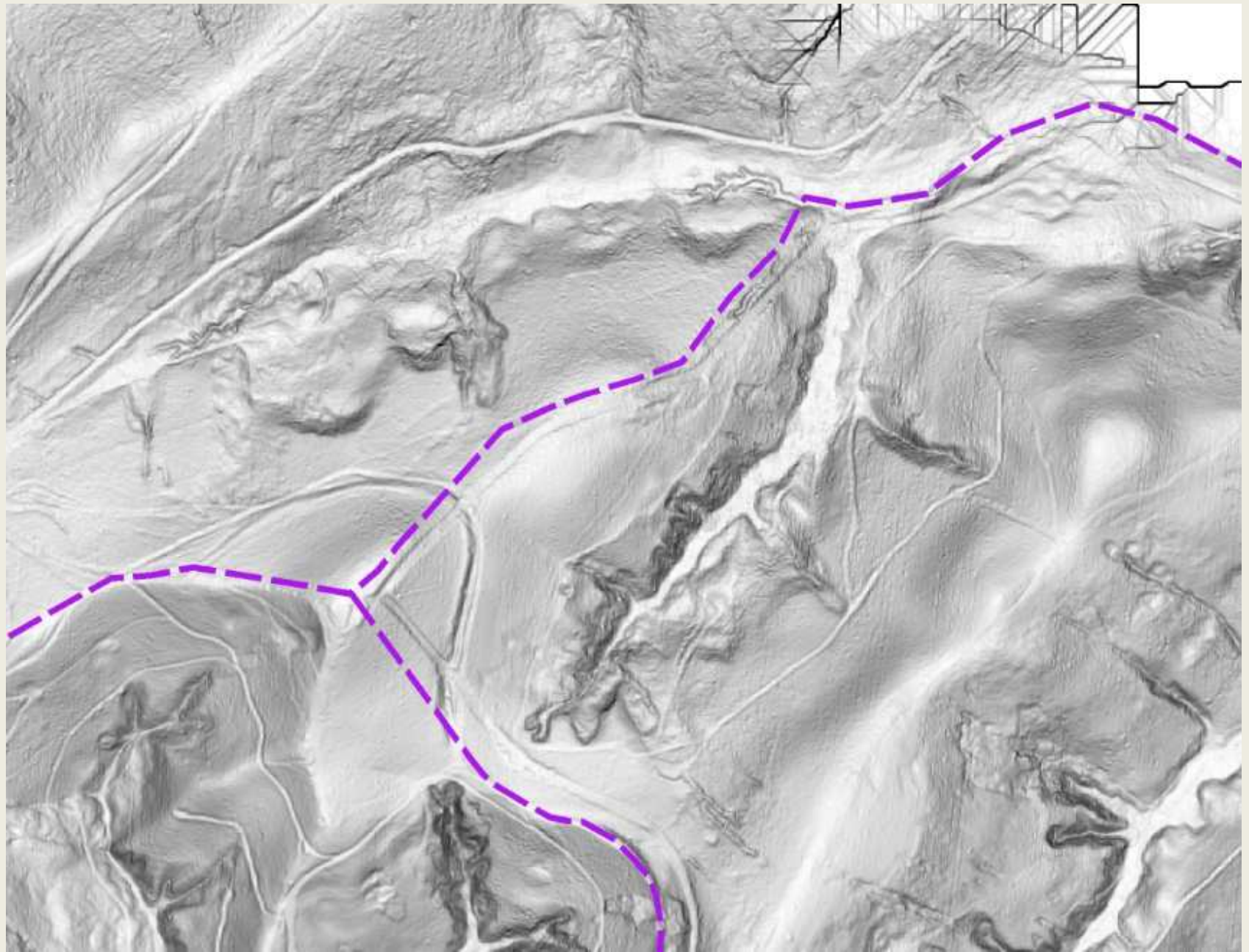


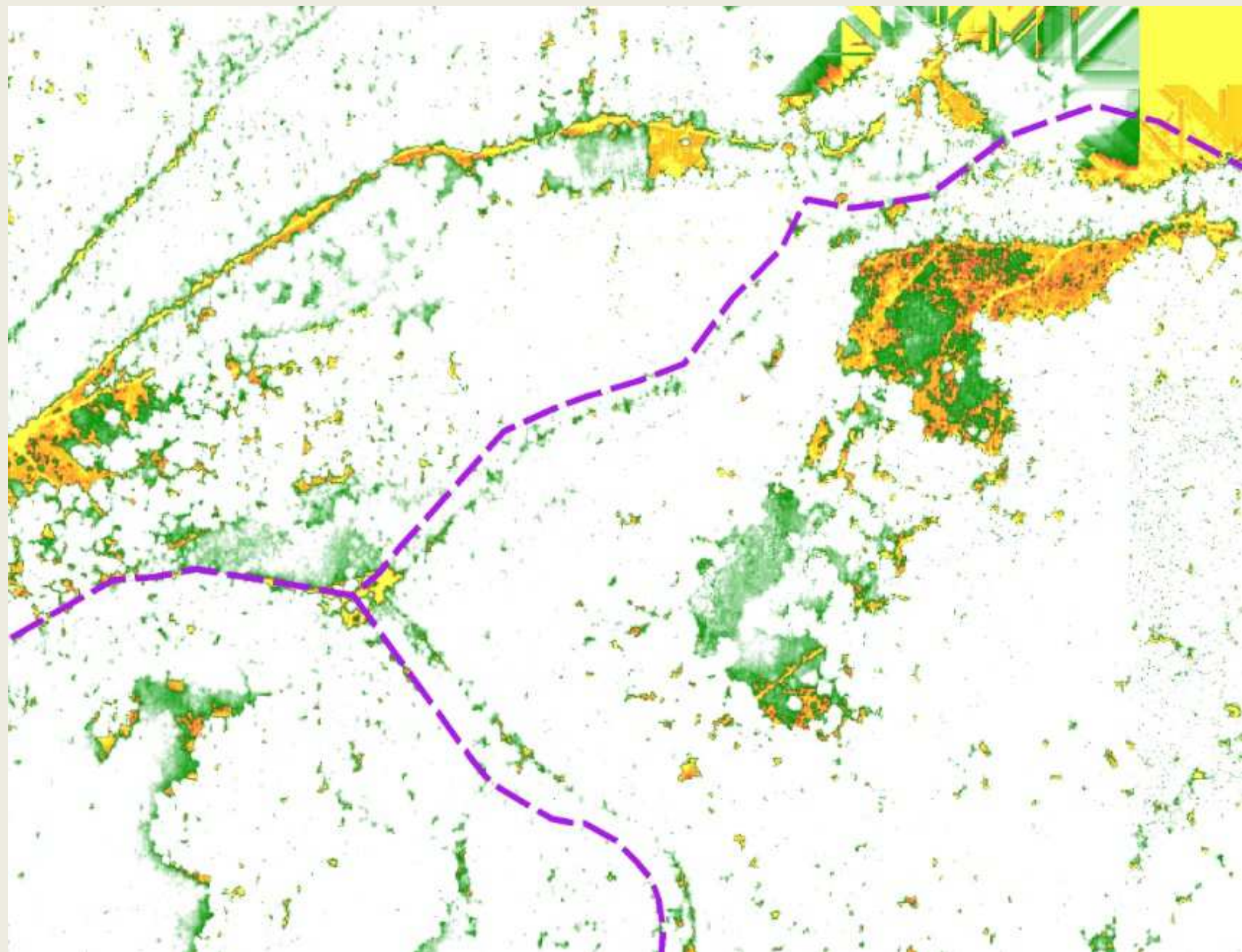
Cross-border ALS data cloud from Slovenia

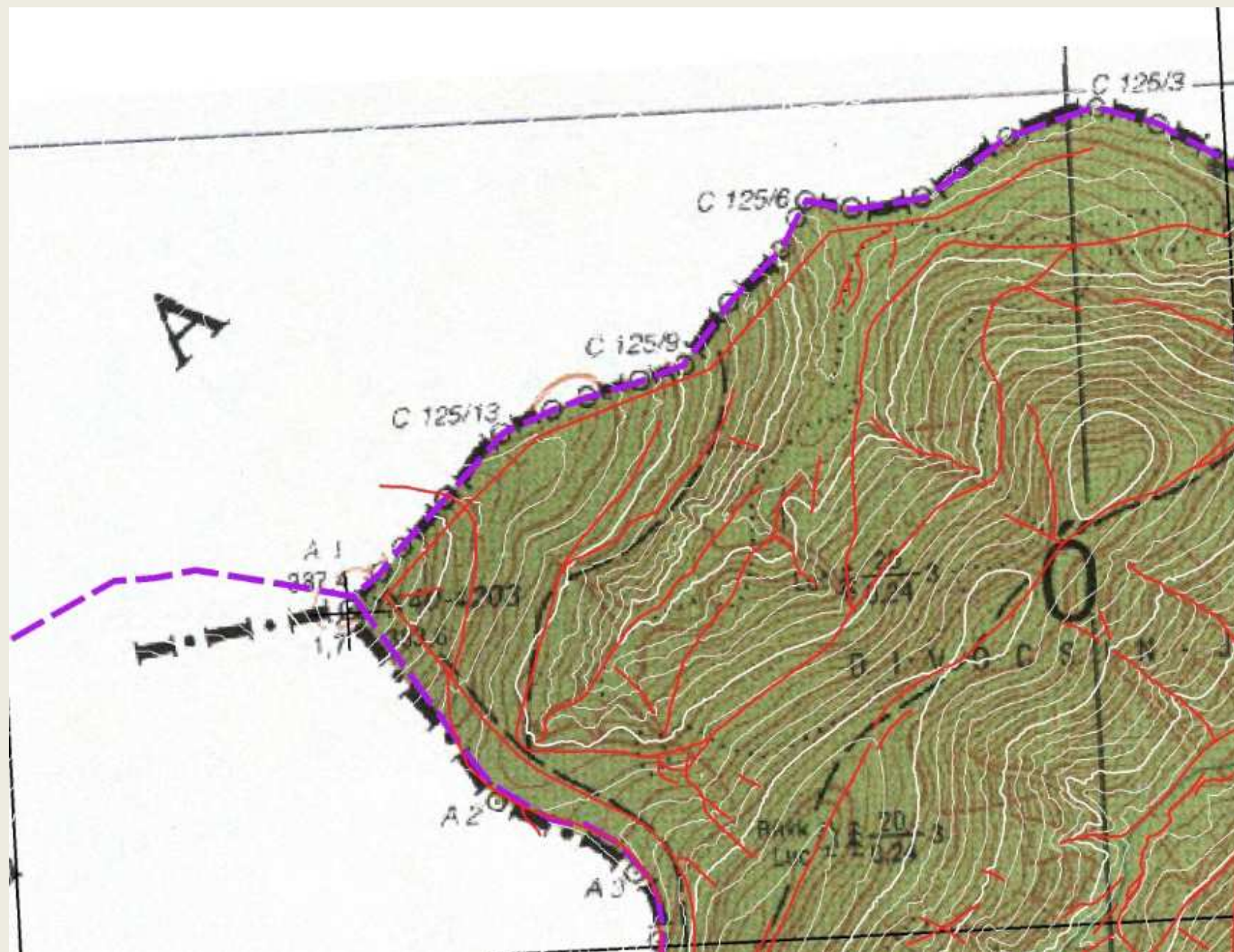




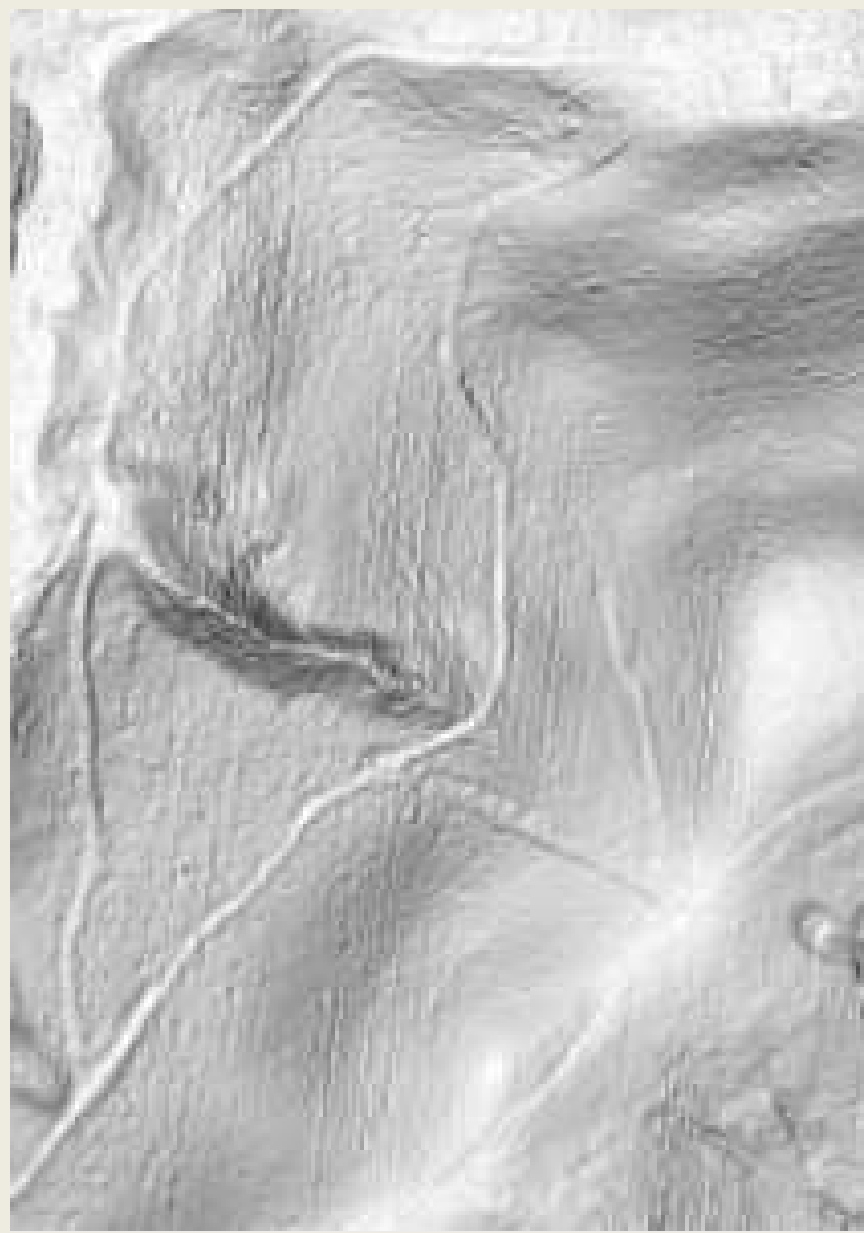


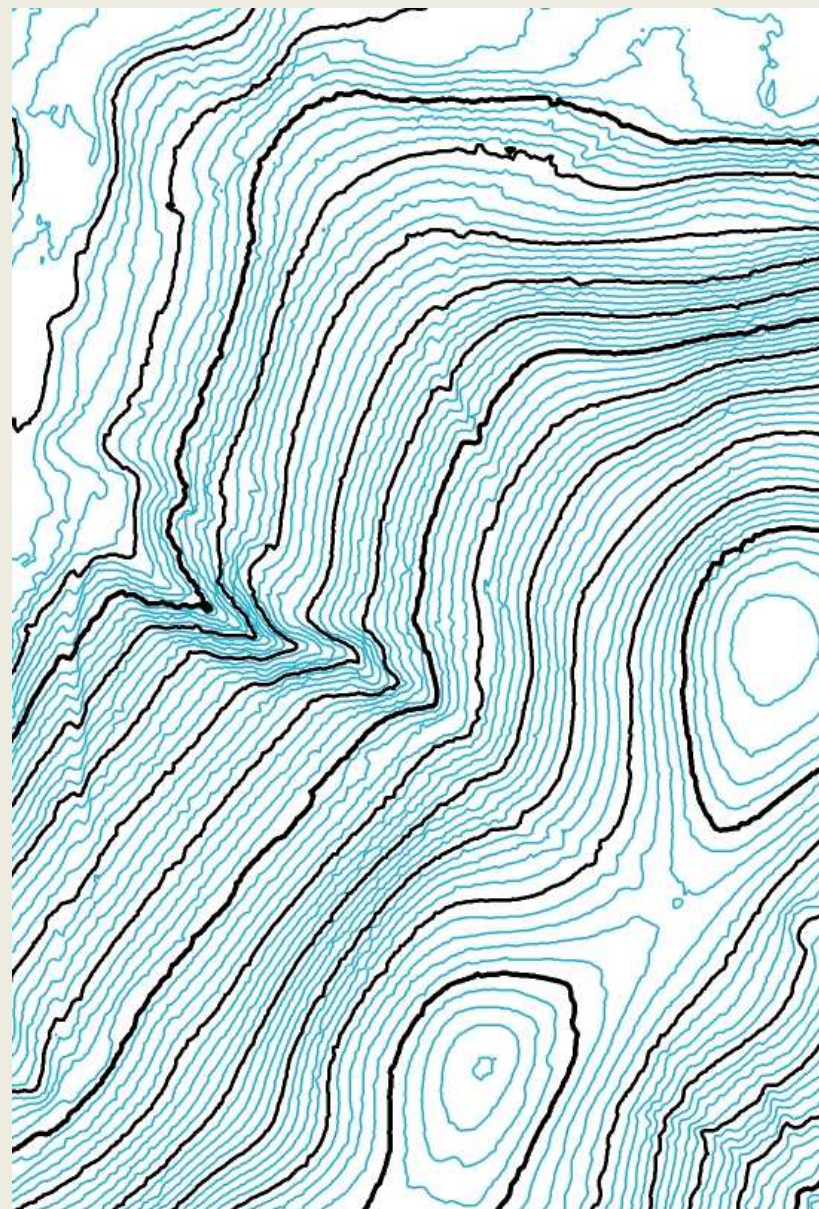




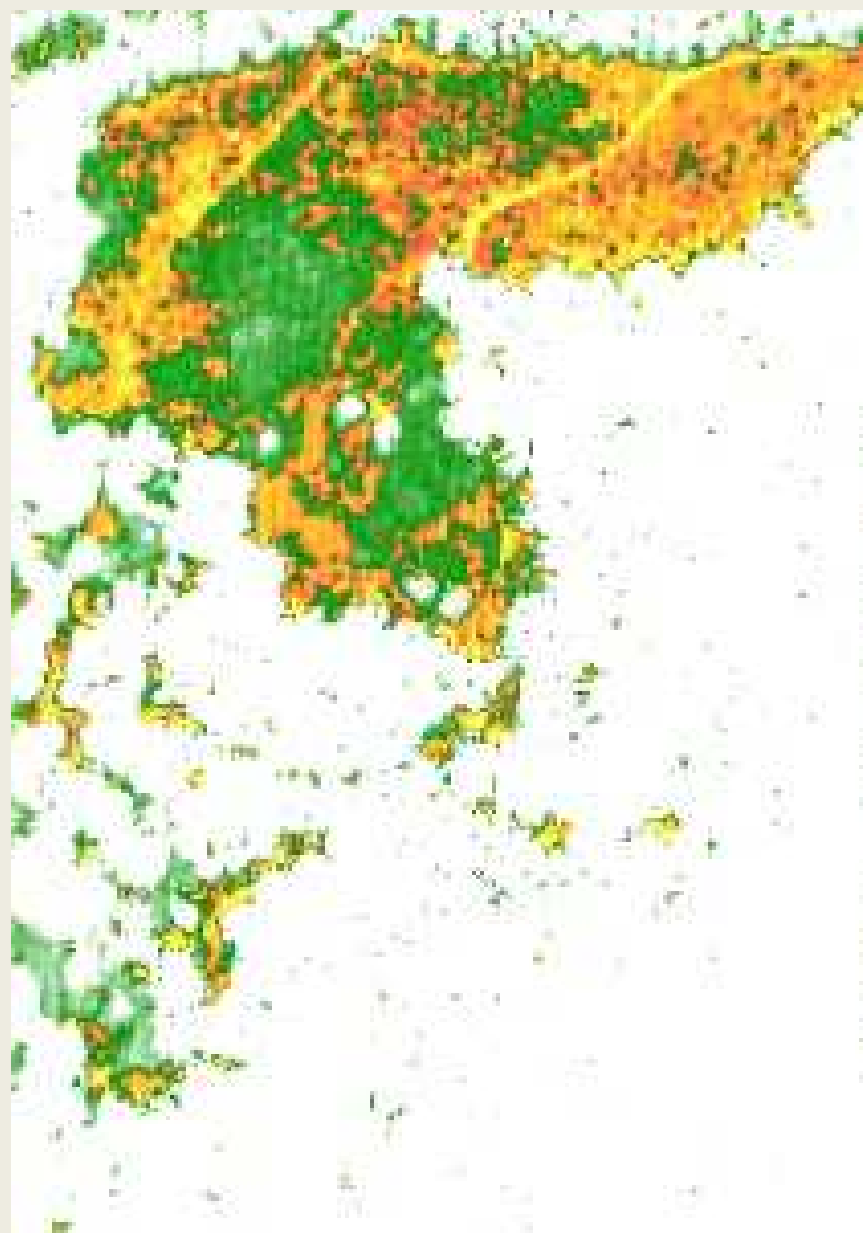


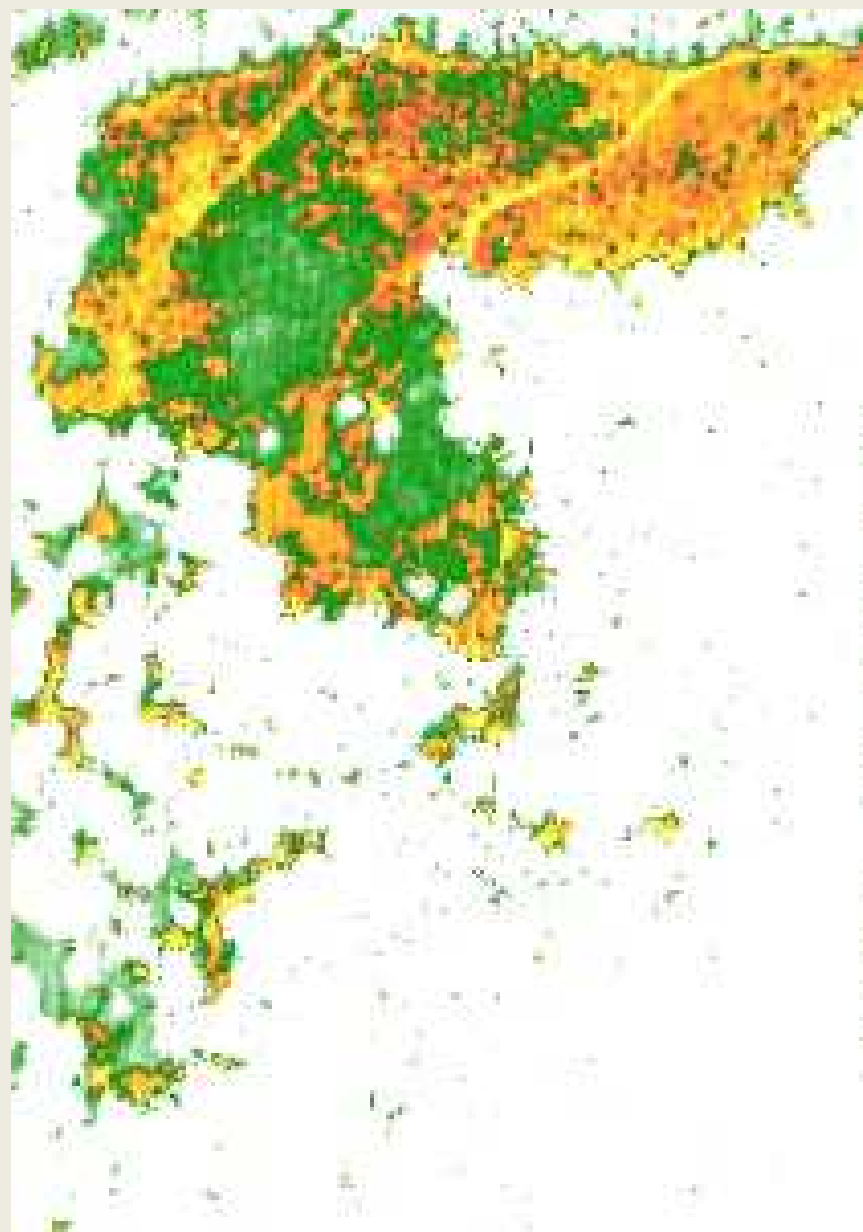


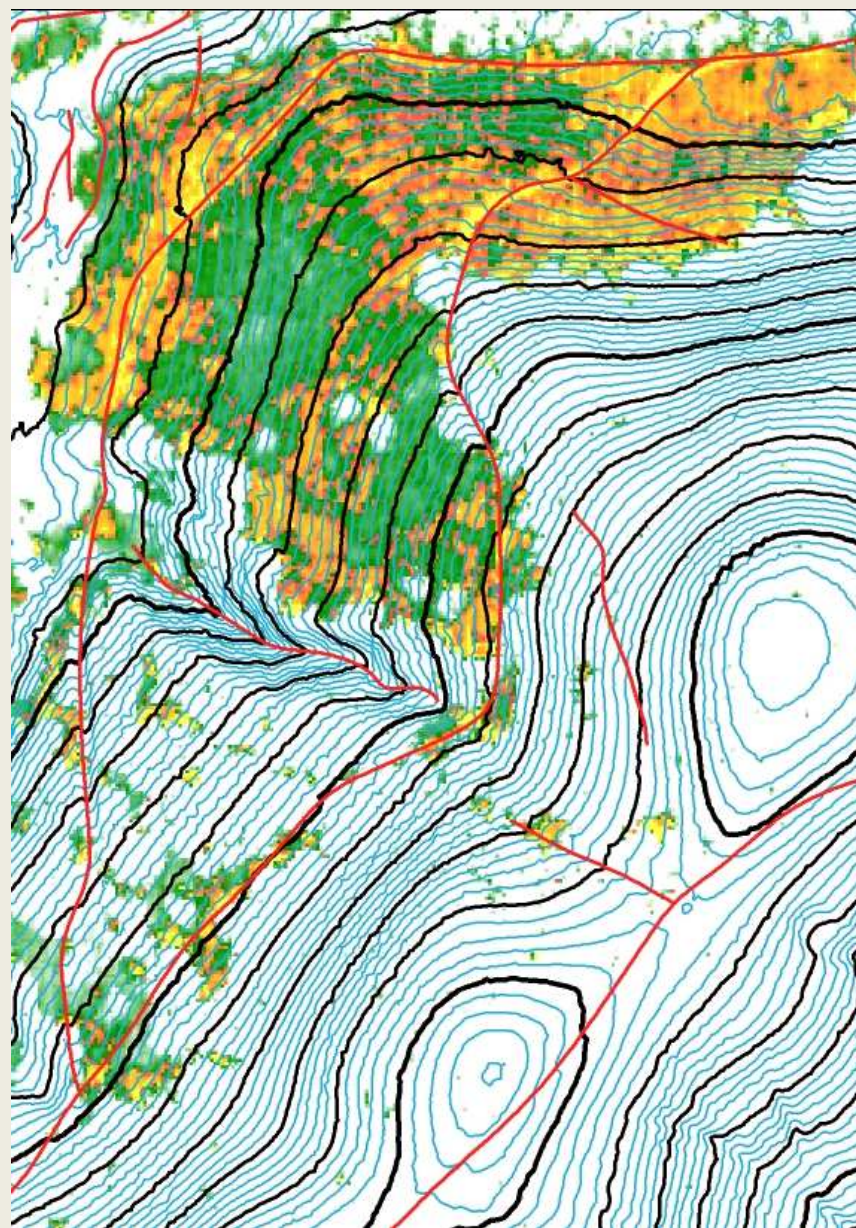












Now we are working with these basic maps in Hungary

200 méter



Topográfiai térkép 1961



Ortofotó 2005



Google maps 2015



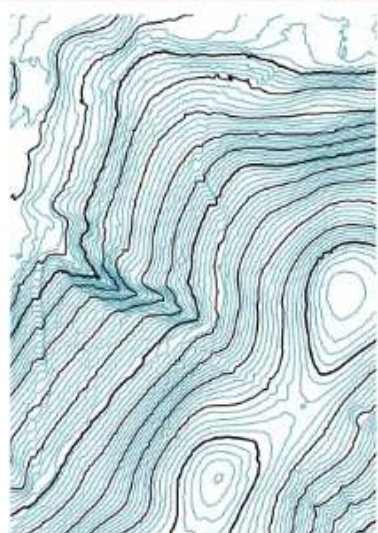
ALS növényzet

Ezzel dolgozunk

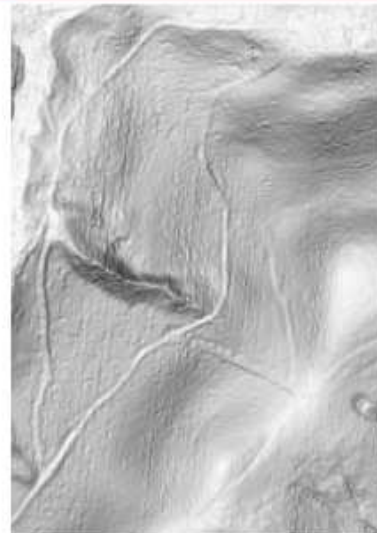
Méretarány 1:4000



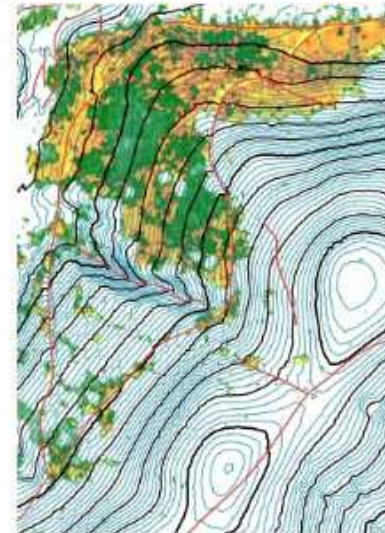
Topográfiai térkép 1961 +
ALS domborzat



ALS domborzat



ALS lejtőárnyékolás



Ezzel dolgozhatnánk

This is the future