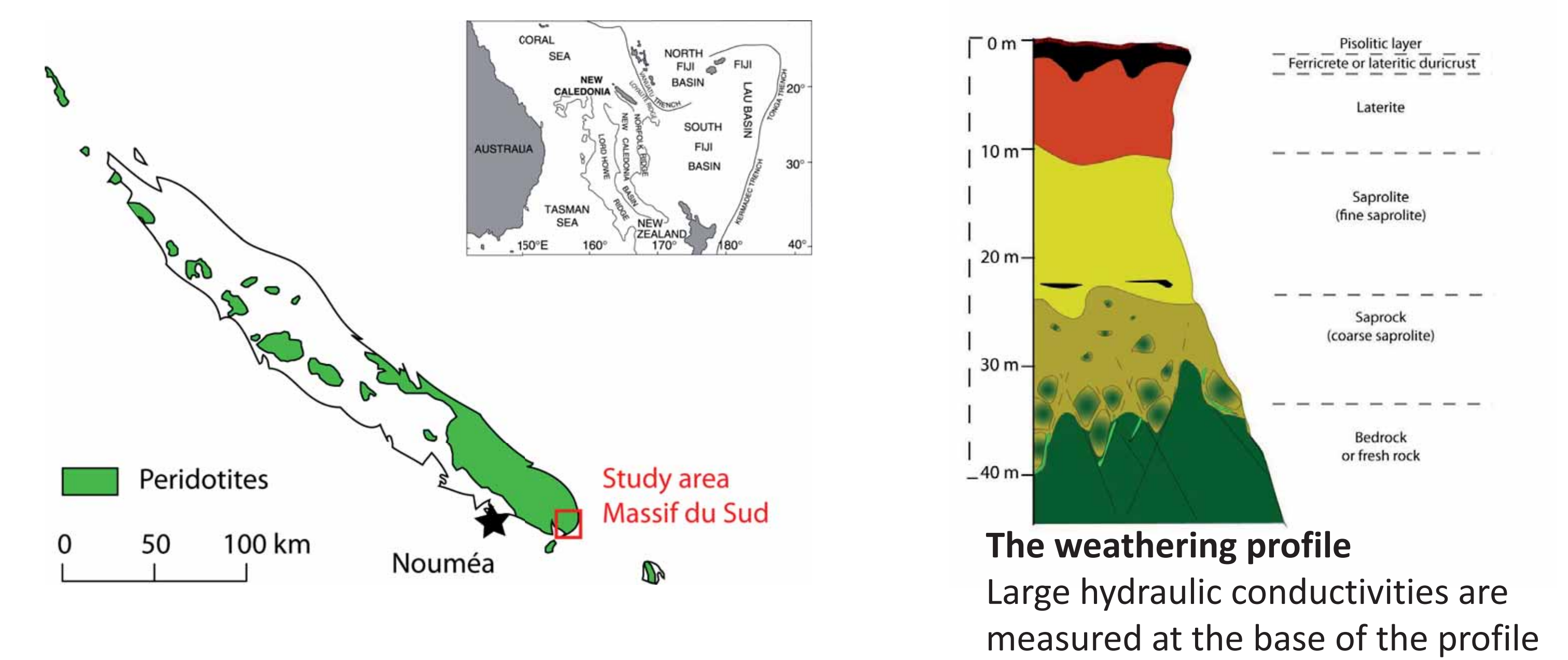


Morphology and distribution of dolines on ultramafic rocks from airborne LIDAR data

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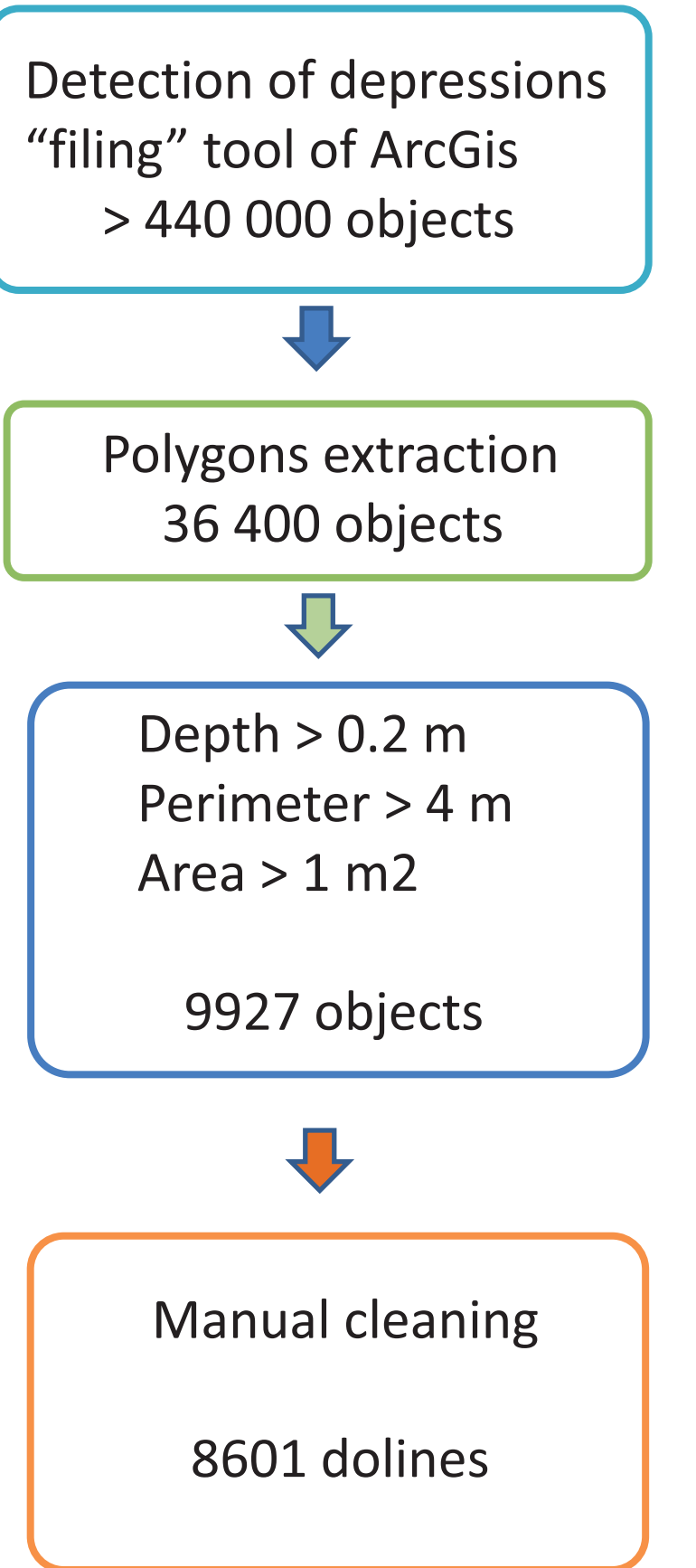
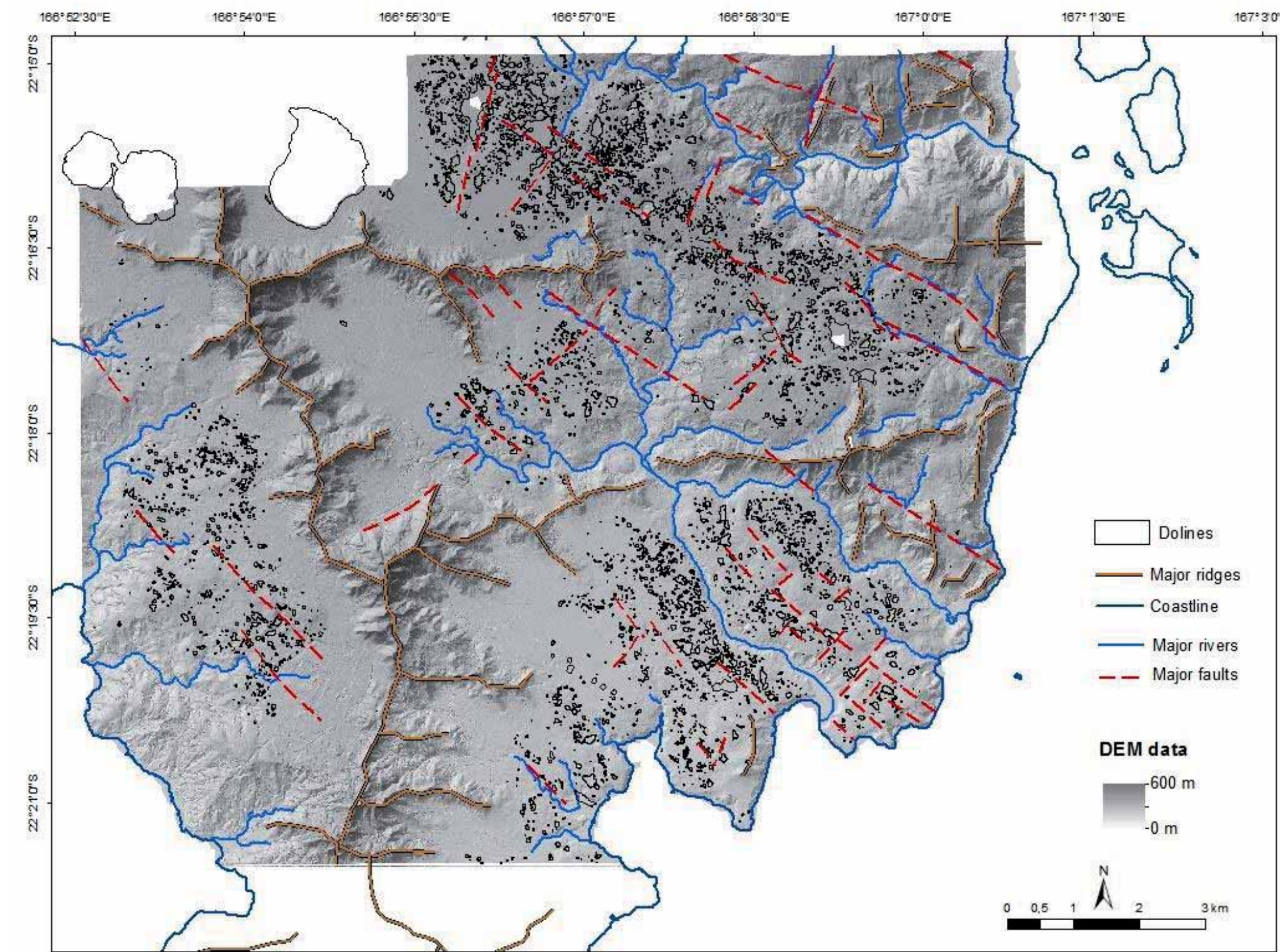
1) Introduction



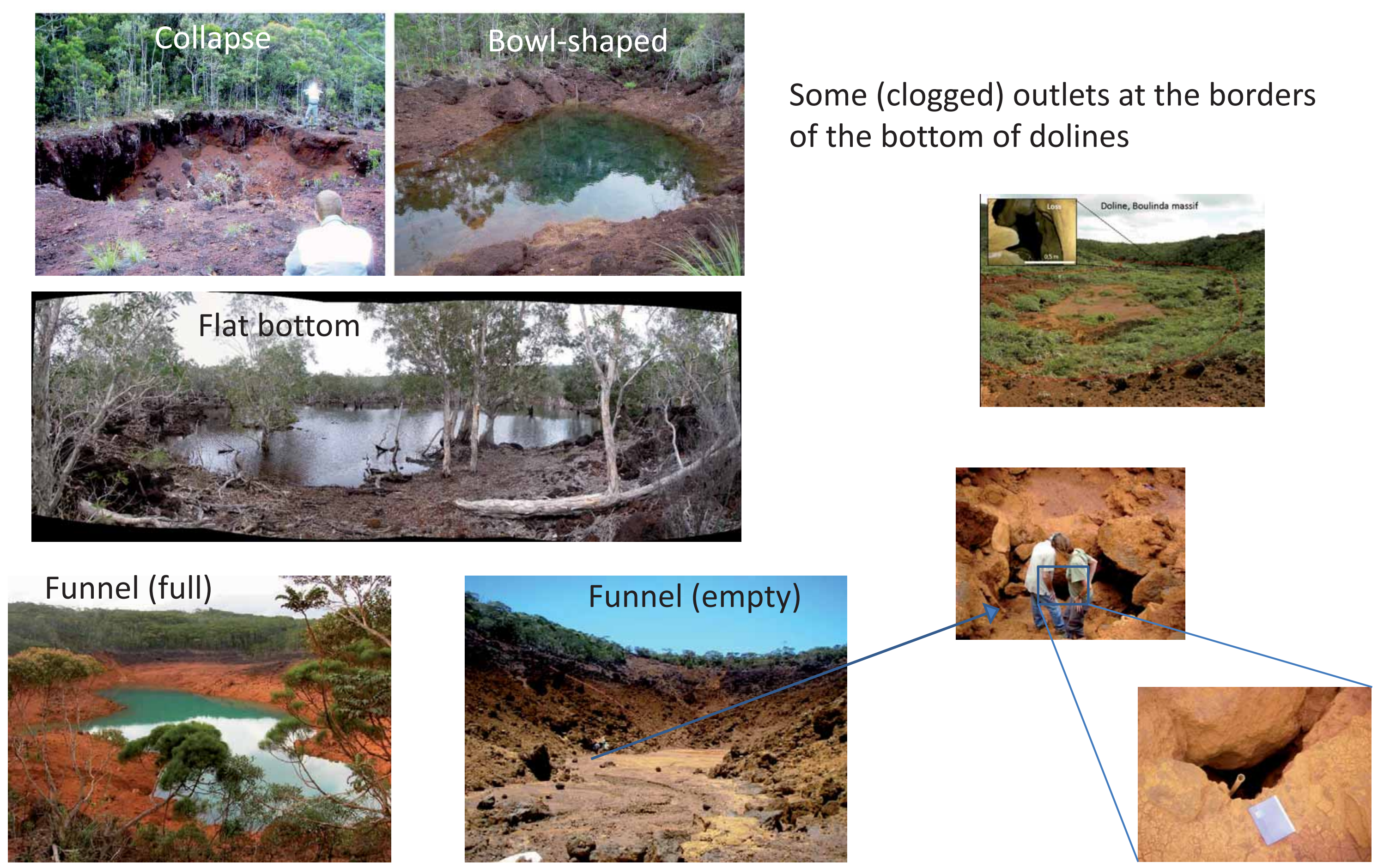
Ultramafic rocks constitute the most part of the Southern New Caledonia and are seen as isolated klippe along its west coast. Ultramafic rocks are mainly weathered by dissolution in a tropical humid climate, with a resulting volume reduction of 60-90%. This results in karstic features, dolines, enlarged fractures and to a pseudokarstic landscape

2) LIDAR data allowed doline detection

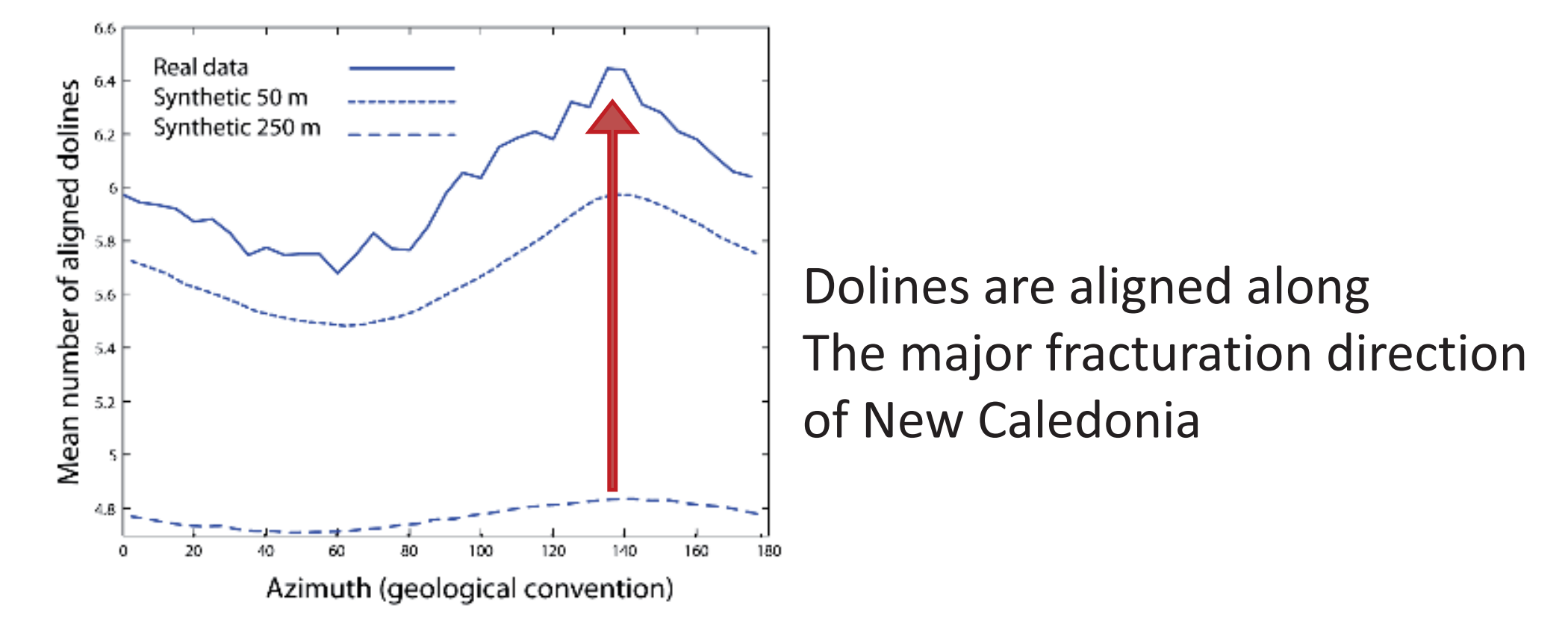
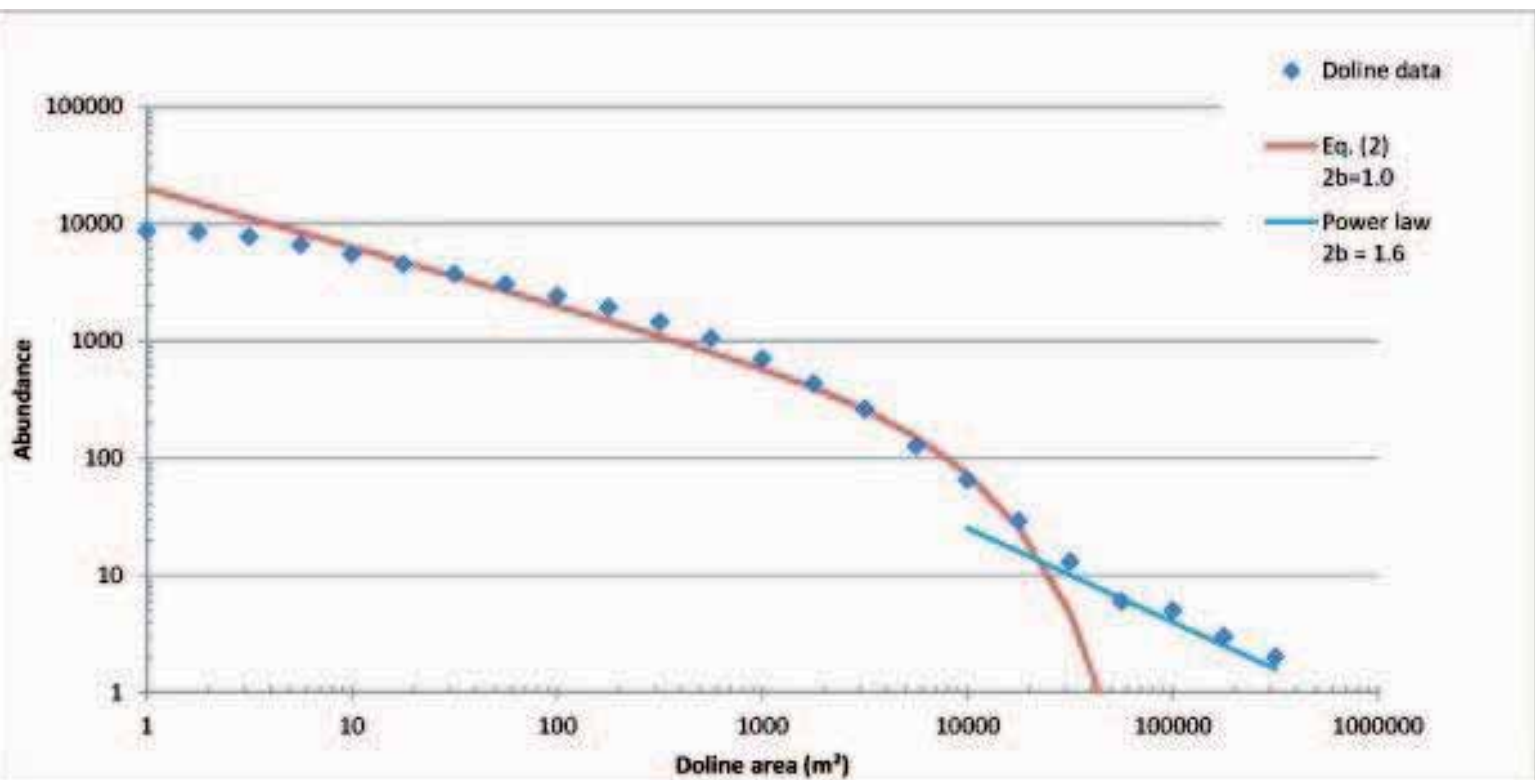
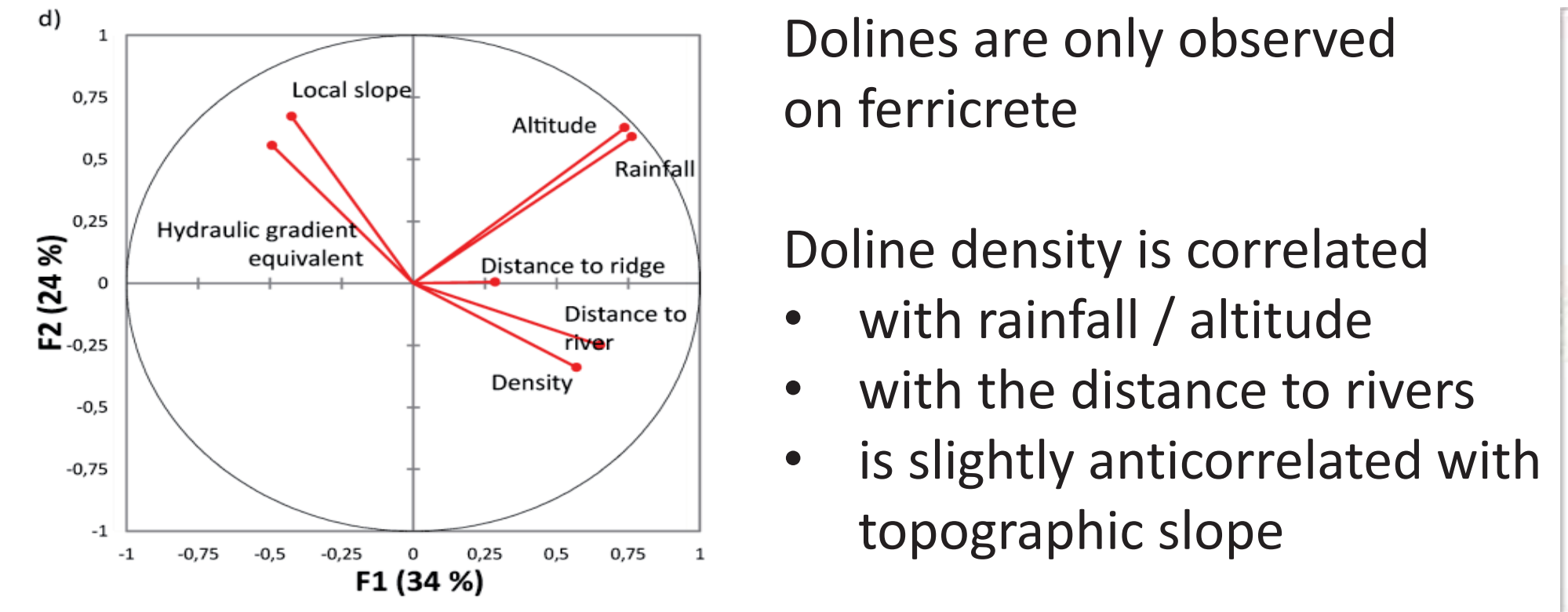
8601 dolines were detected on a 13 km × 13 km area with a surface ranging from 1 m² to 1 km² and a depth from 0.20 m to 30 m



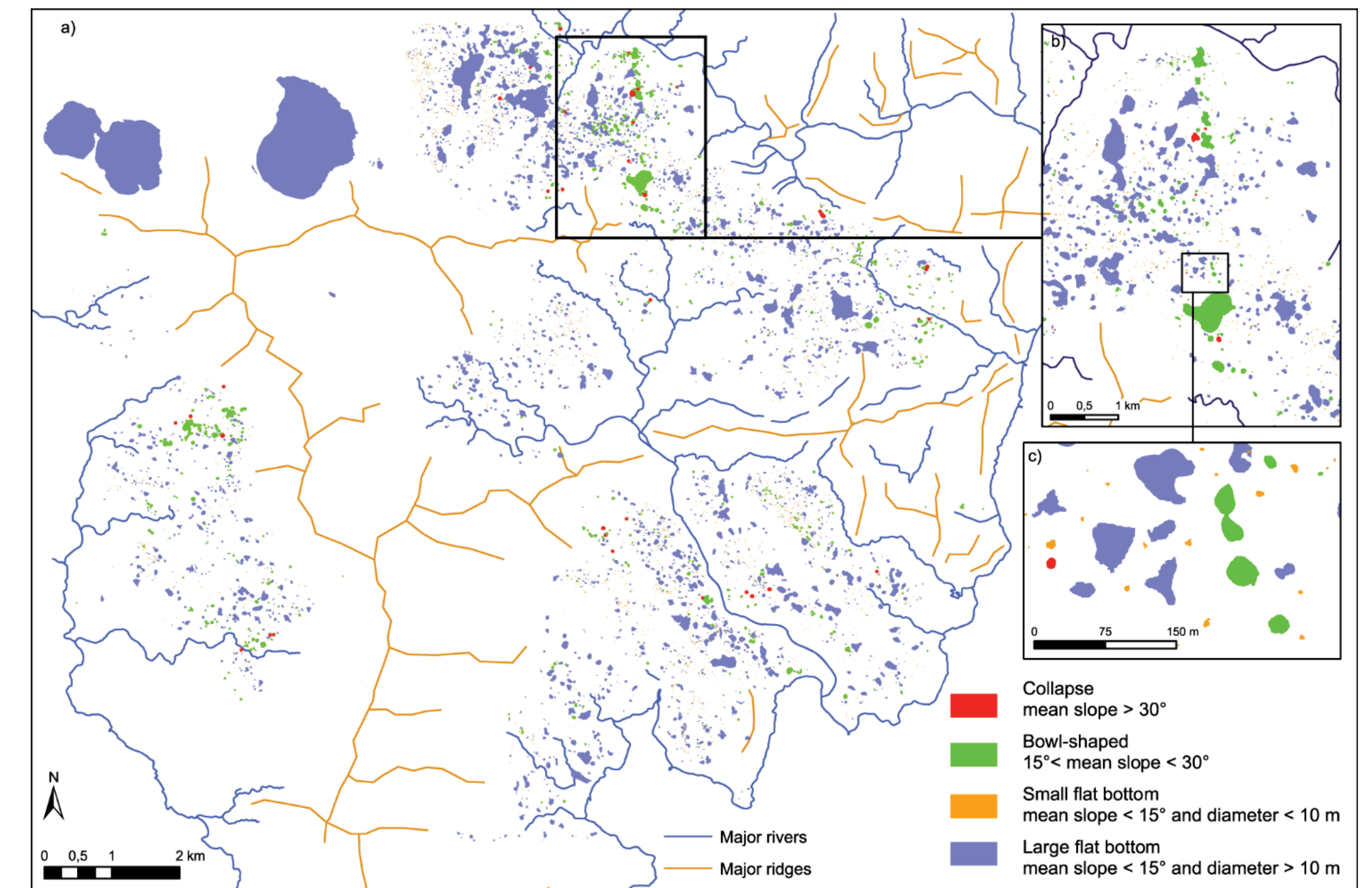
3) A variety of observed dolines



4) Doline distribution



5) Toward a classification of dolines



6) Conclusions

- Dolines on ultramafic rock are controlled by the same mechanisms as in limestone karst, i.e. volume reduction due to dissolution by rainwater and entrainment of fine material (suffosion)
- Dolines are generated as collapse instability in the ferricrete. They generally evolve toward wide sedimented and shallow structures, but in some instances, they evolved toward deep funnel type dolines able to reach the base of the weathering profile.
- Therefore, collapse and bowl shaped dolines should be monitored when infrastructure (mines, roads) are planned

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