



## **Drone photogrammetry for geological research: field digital stratigraphic logs for turbiditic reservoir analog studies in Calabria, Southern Italy.**

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Drone technology combined with new algorithms like Structure from Motion (SfM) has revived and expanded the uses of photogrammetry bringing new flexibility and the capacity to carry on close range photogrammetry to inaccessible areas. This characteristics are particularly appealing in field geology offering the option to reconstruct continuous digital outcrop models of vertical or difficult to reach outcrops.

In this light we present the results of a digital outcrop modelling of a Miocene turbiditic system (mainly sandstone) in Calabria (Southern Italy) generated through field data collected by means of a light-weight commercial drone, a detailed geological field survey and cloud point photogrammetric analyses comparing different software for this purpose (Agisoft Photoscan, Drone deploy, Arc3D). The geological model has been used as an input for preliminary reservoir modelling.

We generated digital geological sections (stratigraphic logs) of 1,200 m of sections using expert digital image and terrain model interpretation from the DTM generated with drone data, with the goal to reconstruct the real thickness of each layer. We then compared the results with previously created detailed field geological cross sections. The comparison between drone-derived sections and field-survey sections shows a global accuracy of the thickness ranging between 1% to 10%. Although this new methodology still has to be validated in other morpho-lithological context it already demonstrating its usefulness for preliminary geological outcrop investigation and modelling in remote areas.

We also compared the different softwares used and we made recommendations for future deployment.

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