The contribution of high-precision LIDAR in environmental studies: applications to solar installations, flood risk and biomass estimation

Audrey Alajouanine and Khalil Masmoudi (France)

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SUMMARY

Recent advances in LiDAR and lasergrammetric technologies are redefining the role of the surveyor in environmental management. High-resolution point cloud data now allow the creation of Digital Terrain Models (DTM) and Digital Surface Models (DSM) with centimeter-level precision, enabling a new generation of applications that combine technical accuracy with sustainable development goals.

This presentation highlights how precision laser scanning can bring measurable value to environmental studies in three major domains:

1. Solar Energy Planning – Using DSM and DTM data to assess solar potential, optimize panel positioning, and minimize shading impacts.

2. Flood and Risk Management – Employing detailed topographic models for accurate hydrological simulations and identification of vulnerable areas.

3. Biomass and Vegetation Analysis – Deriving canopy and height models from point clouds to support environmental monitoring and carbon assessment.

Beyond technical accuracy, the presentation focuses on the added value for decision-makers and project developers: faster project delivery, improved data visualization, and stronger communication through 3D digital twins.

By transforming precise laser data into actionable insights, surveyors can play a central role in building smarter, greener, and more resilient territories. This presentation aims to demonstrate how

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integrating lasergrammetric tools into environmental workflows is not just a technological step forward, but a strategic opportunity for the geomatics profession.