

Mapping the Loire

Project

A recent study estimated that severe flooding of the Loire could result in the inundation of more than 13 000 businesses between Nevers and Angers, endanger 21 000 lives in the city of Orleans alone, and potentially cause damage of more than 6 billion Euro to the region.

To manage and reduce the risk, an overall plan for the Loire has been developed by DIREN Centre (Direction Régionale de l'Environnement du Centre), the regional body for Central France within the French Ministry of the Environment. The project covered an area of some 1870 km² extending from Nevers to Nantes and was divided into seven sub-areas to be flown in two phases.

Processing

The lidar data was acquired with an Optech ALTM. Although the system can be flown at altitudes up to 3 000 m, a ceiling of 900 m was chosen for two reasons; the cloud base in the area is frequently low (down to 1000 m), and flying at low altitude improves the absolute accuracy of the measurements.

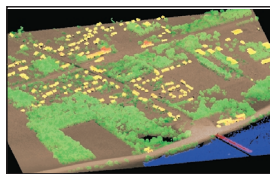
The advanced path carried the conventional ground/non-ground classification a step further to cover identification and classification of individual buildings and vegetation cover.

By using the intensity information from the reflected laser signal, TerraImaging was able to address this challenge while also developing a useful toolset for future projects. The solution chosen made use of an object-oriented approach and the popular eCognition software package. The approach gave very promising results in automatically differentiating between different land cover themes.

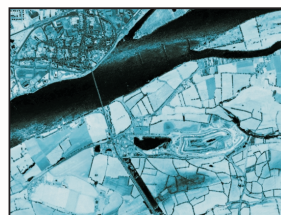
Products

A number of data products were produced for DIREN from the raw lidar data including raw points, digital surface models, digital terrain models, water points, building points, high vegetation points, a full digital terrain model in grid format, orthoimagery rectified using lidar data and lidar intensity data.

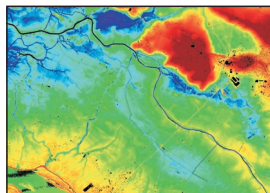
A DTM and a DSM were the final results of the classification, the former containing all information on bare surfaces without bodies of water and the latter containing the DTM plus data relating to buildings, bridges, dykes and vegetation.



3d-view of classified laser points



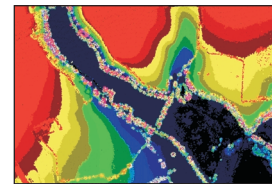
Intensity data



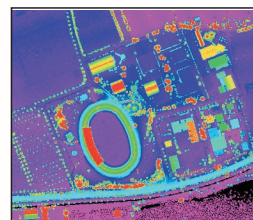
Color-coded ground data



Classification result (water, buildings, vegetation)



Color-coded raw data



Color-coded first pulse data



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