

Belgian Earth Observation Day 2014
Thursday 20 November



REMOTE SENSING IN SUPPORT OF PUBLIC SERVICE OF WALLONIA ACTIVITIES



Service public de Wallonie
Secrétariat général
Département de la Géomatique

Dominique Buffet – Christophe Schenke – Catherine Meunier

Context of public sector

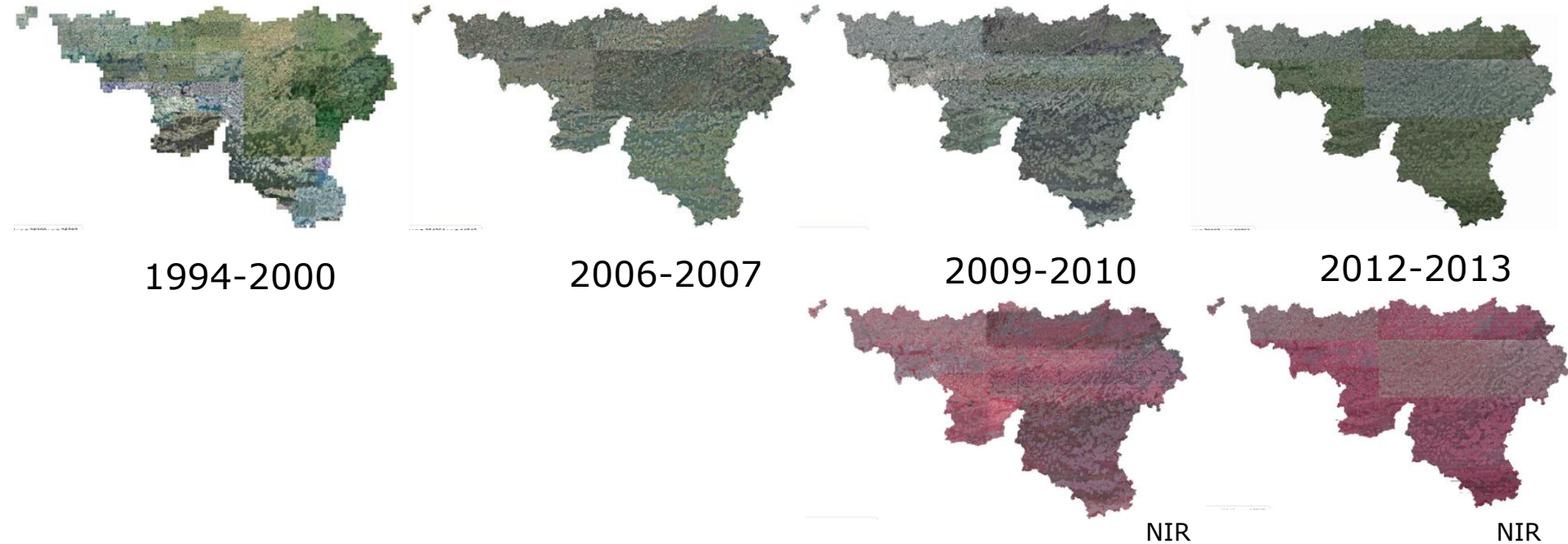
- **The use of geographical information is growing continuously:**
 - Considering the evolution of regional, national and EU **policies**
 - Responsibility for making a **broad range of management decisions** daily
 - To achieve our **missions of public services**
- **In order to satisfy this demand, geo-databases must be:**
 - Exhaustive for mapping and analysis of **all the territory**
 - **Frequently updated** with the highest possible **metric and thematic accuracy**
- **Sources of updates:**
 - Must be **operational, reliable**, highly **recurrent** and mutualisable to remain **cost effective**
 - Must provide **accurate, affordable** and **accessible geospatial information** that can be used alone or in combination with other type of data and information (i.e: from statistical and administrative data)



Aerial images

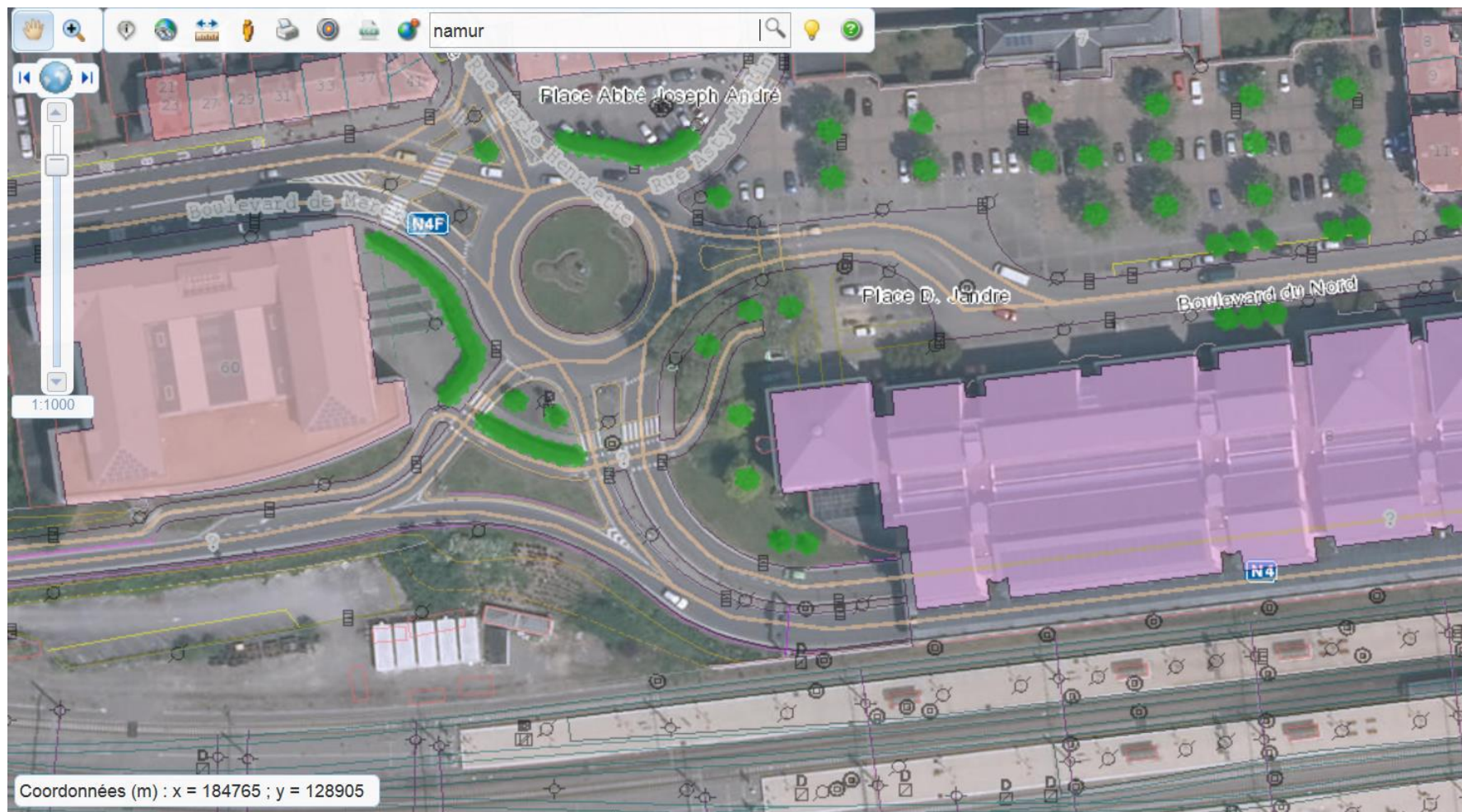
- **Context:**

- The mainstay of remote sensing application => orthoimages
- VHR images georeferenced and orthorectified (50cm - 25 cm)
- 3-4 spectral bands (VIS+NIR)
- Time-series : 1994-2000; 2006-2007; 2009-2010; 2012-2013; 2014; 2015



Aerial images

- Feature identification & extraction (PICC)



Aerial images

- Change detection:

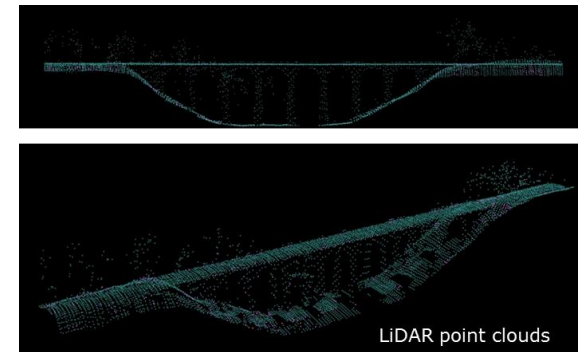
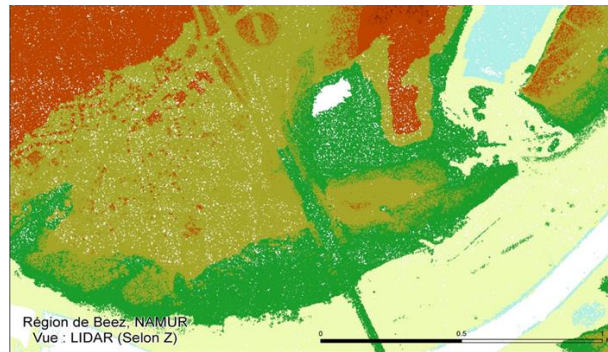


Airborne LiDAR

- **Context:**

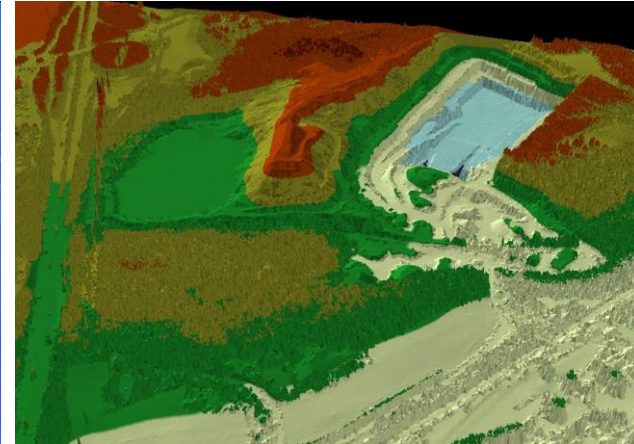
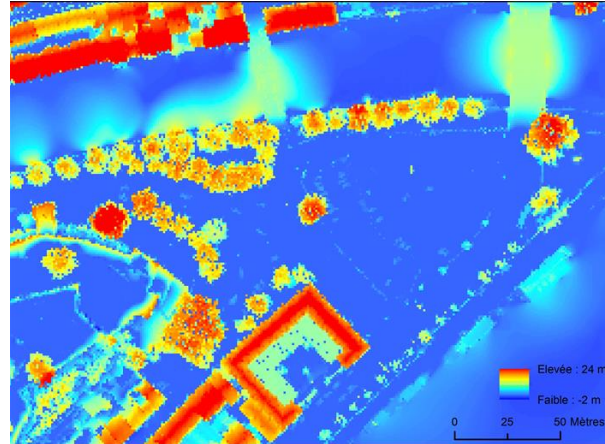
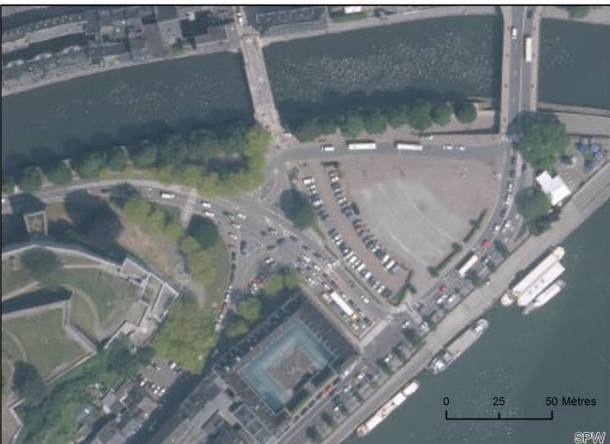
LiDAR products provide representations of the **3-dimensional landscape** in several common GIS data structures: raster, point, and TIN surface.

- Derivate product as **digital elevation models** (DEM's), **digital terrain models** (DTM's), **digital surface models** (DSM's), and triangulated irregular networks (TIN's).
- Provide **intensity information** => feature extraction and object-based classification using descriptive features relatives to the object (spectral, texture, shape, height...)



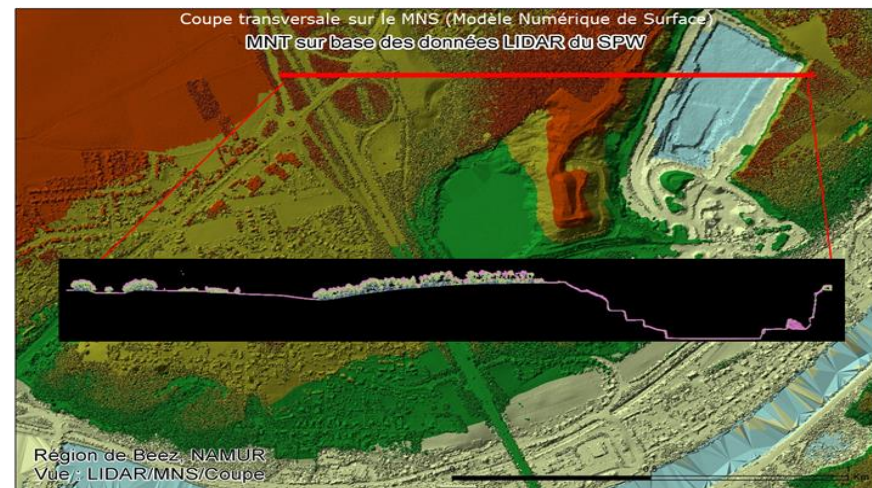
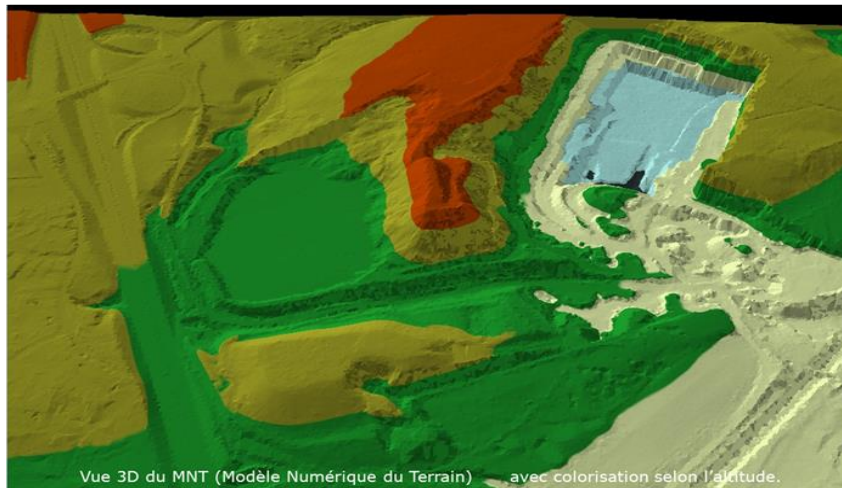
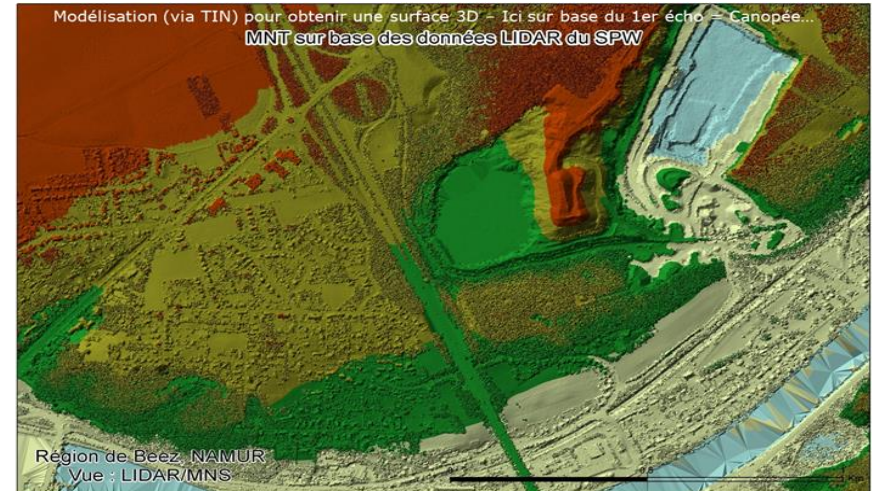
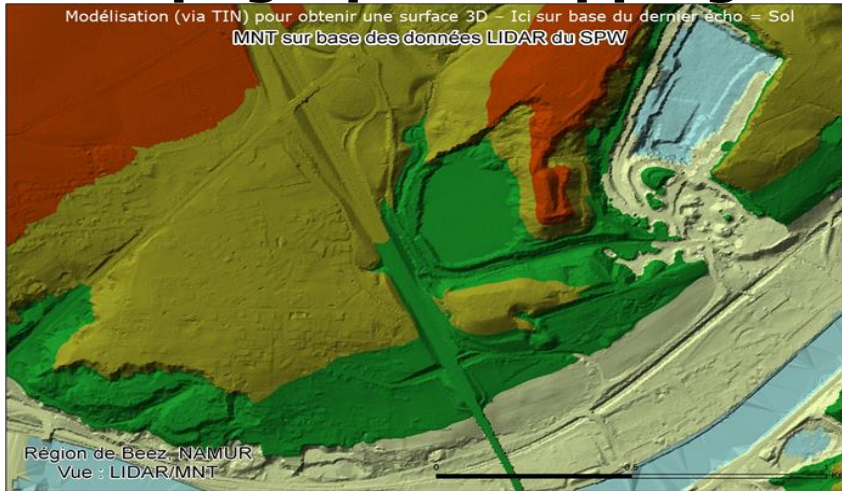
Airborne LiDAR

- **Applications: Altimetry 0.4cm - Planimetry 1m - Density : 0.8 pt/m²**
 - Topographic Mapping
 - **Accurate DTM on all the wallon territory** to obtain ortho-images from a erial images,
 - **Improvement of elevation information** available in PICC geo-datasets
 - Mapping and Cartography
 - Feature extraction and object-based classification
 - Change detection



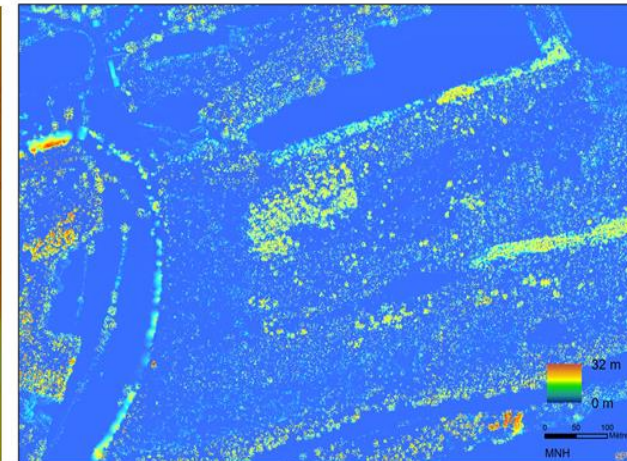
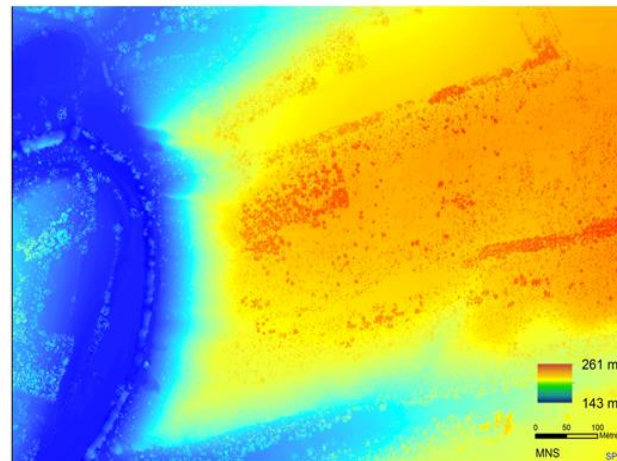
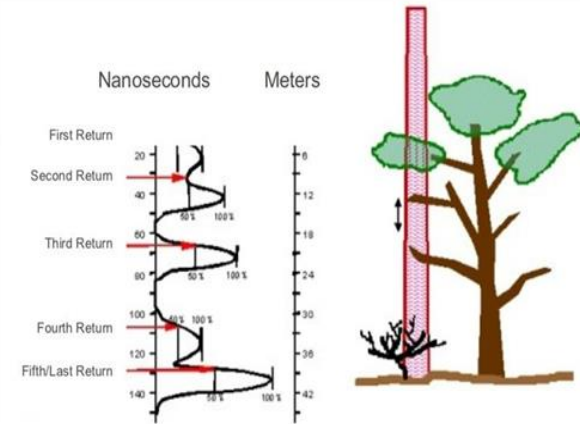
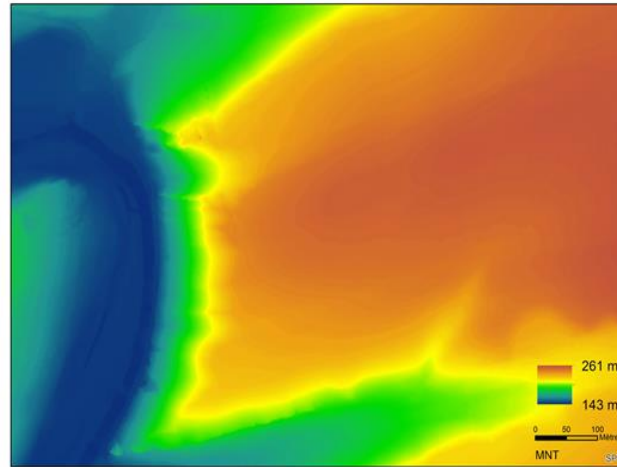
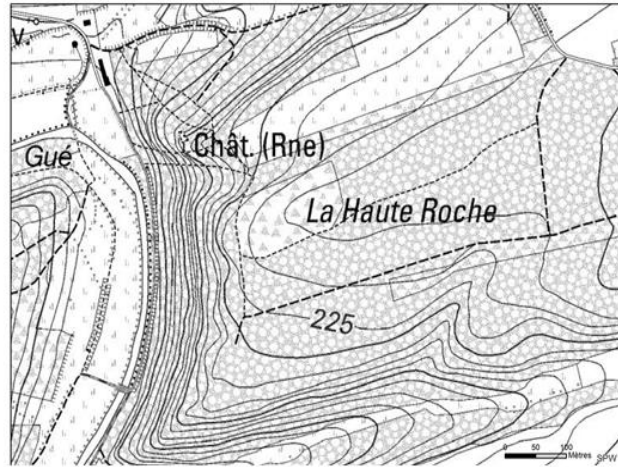
Airborne LiDAR applications

- **Topographic Mapping:**



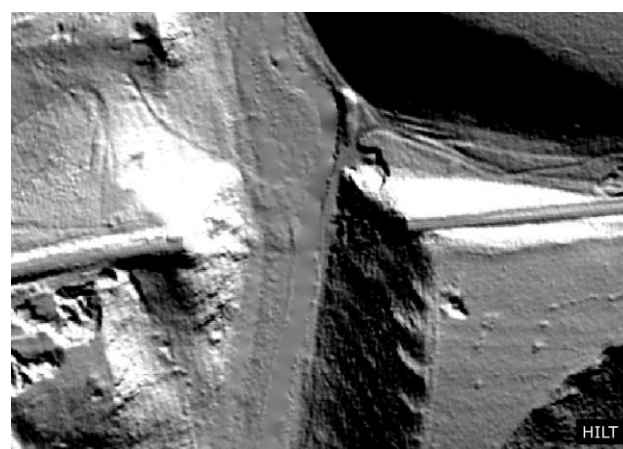
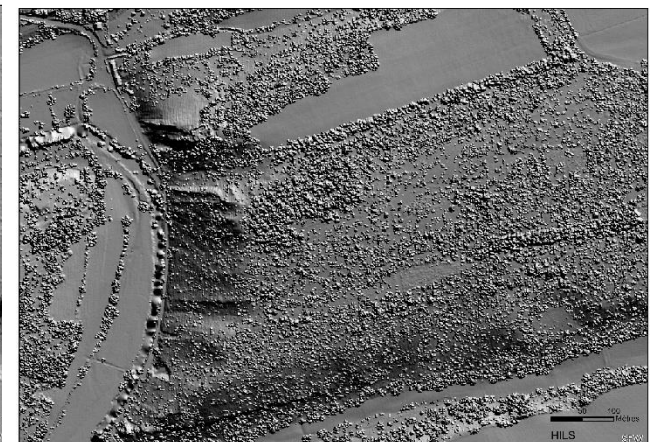
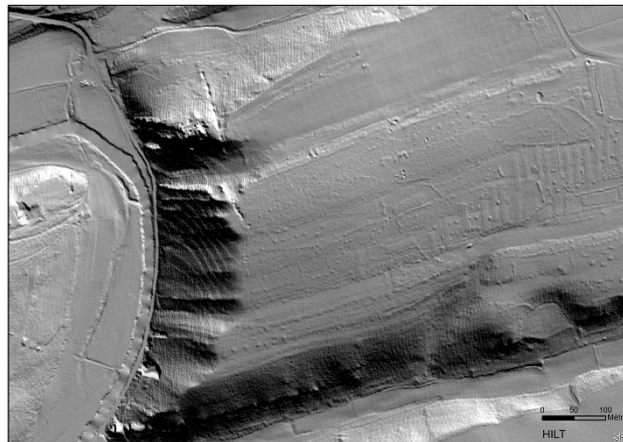
Airborne LiDAR applications

- **Topographic Mapping & LCLU classification:**



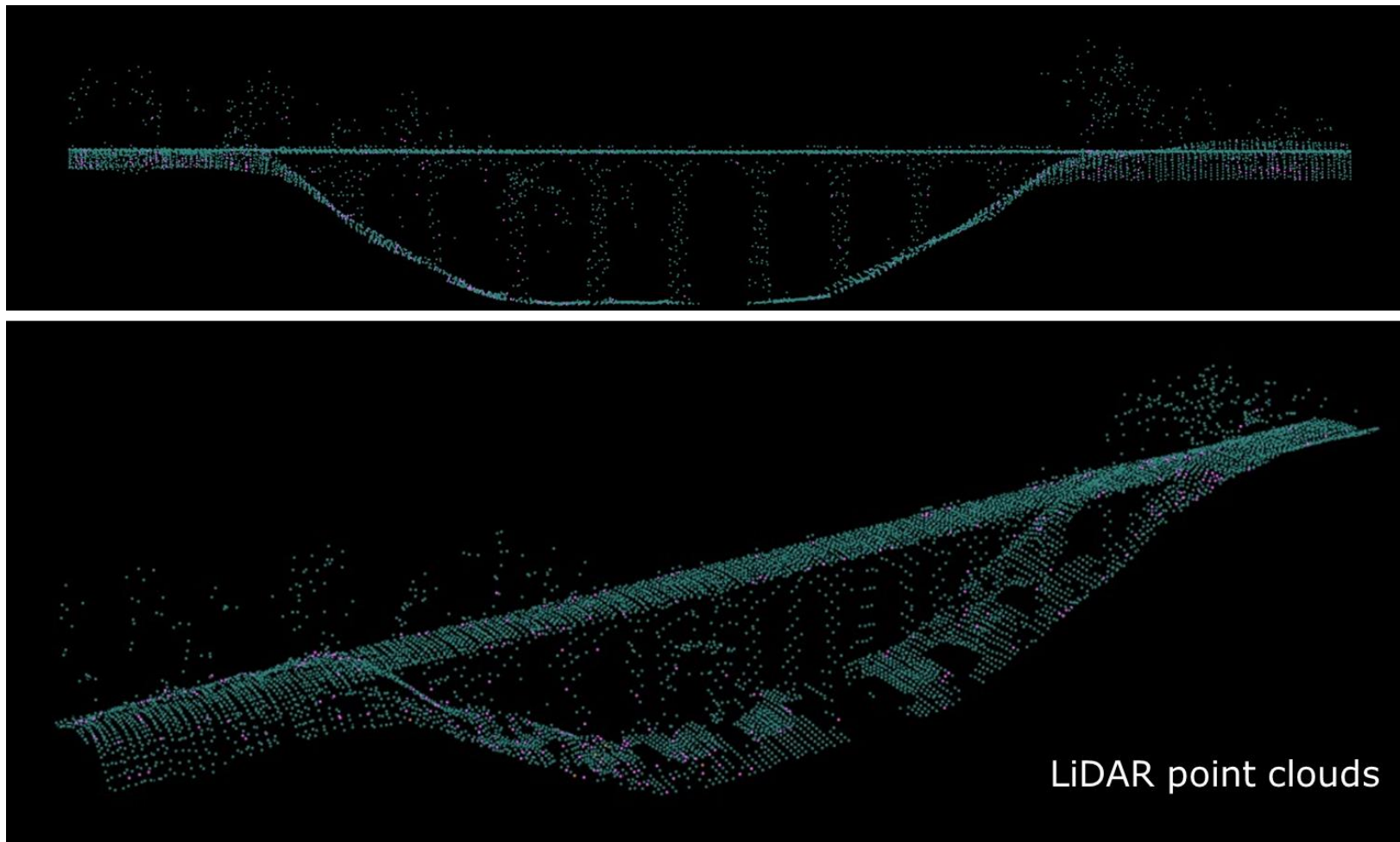
Airborne LiDAR applications

- **Topographic Mapping:** Slope, Aspect and Hillshade



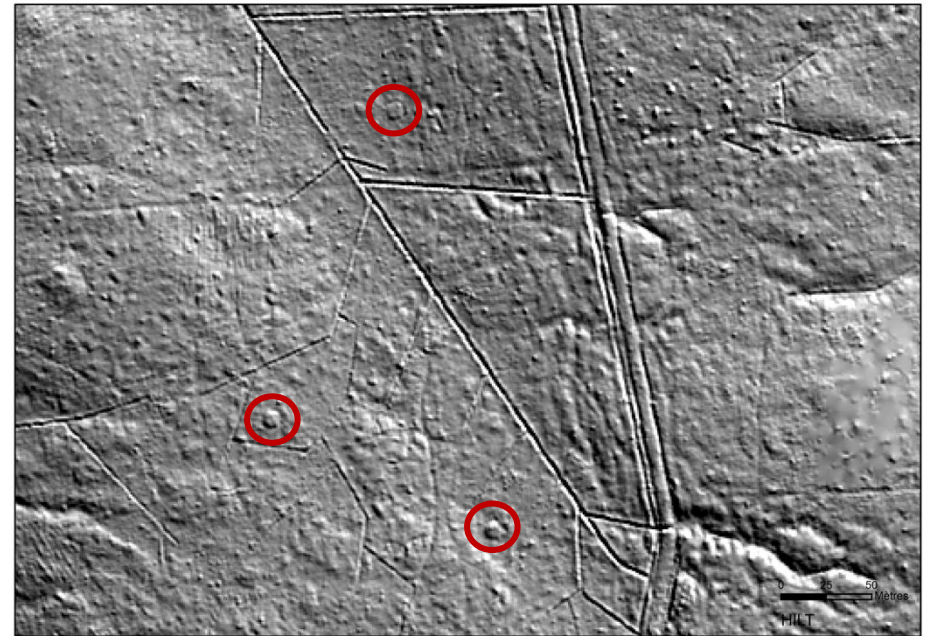
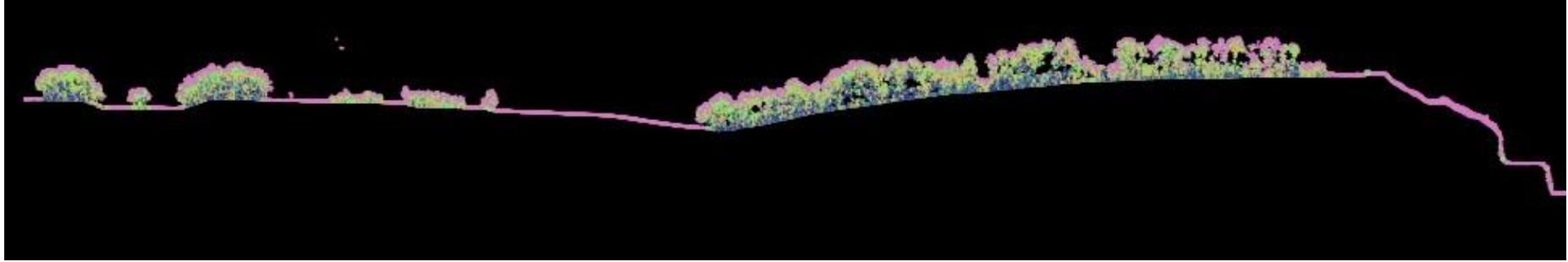
Airborne LiDAR applications

- Feature extraction in 3D

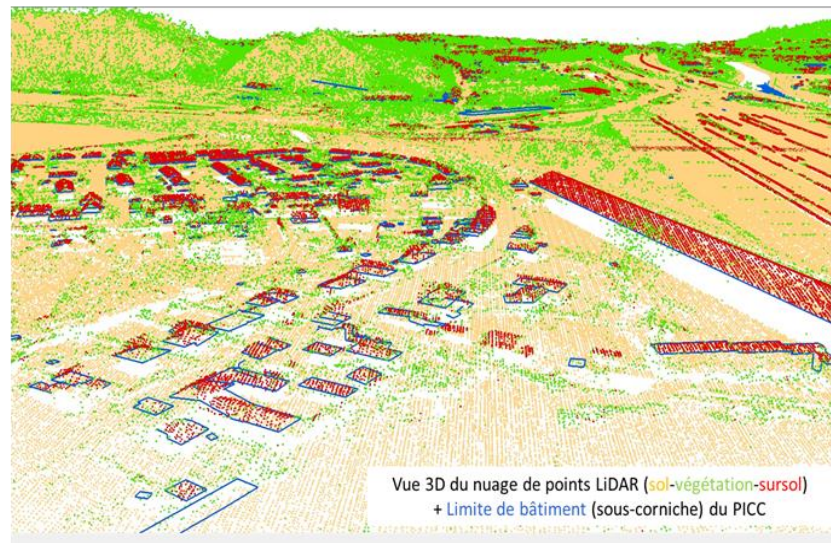
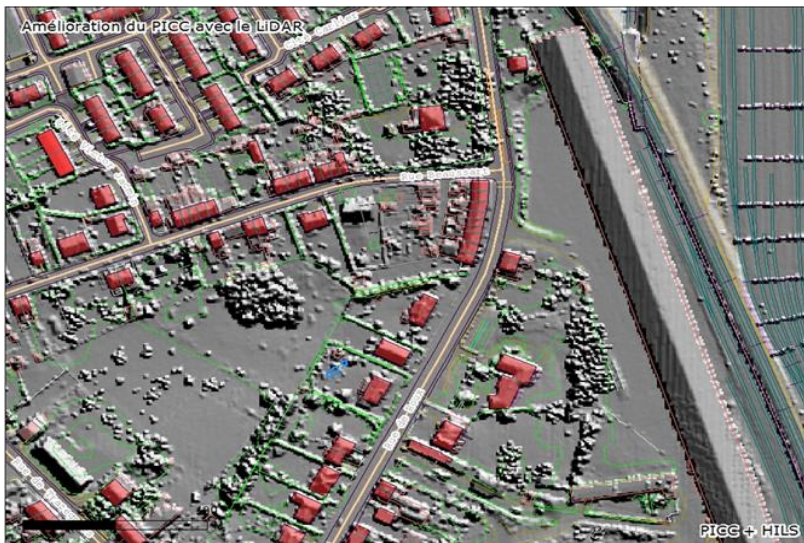
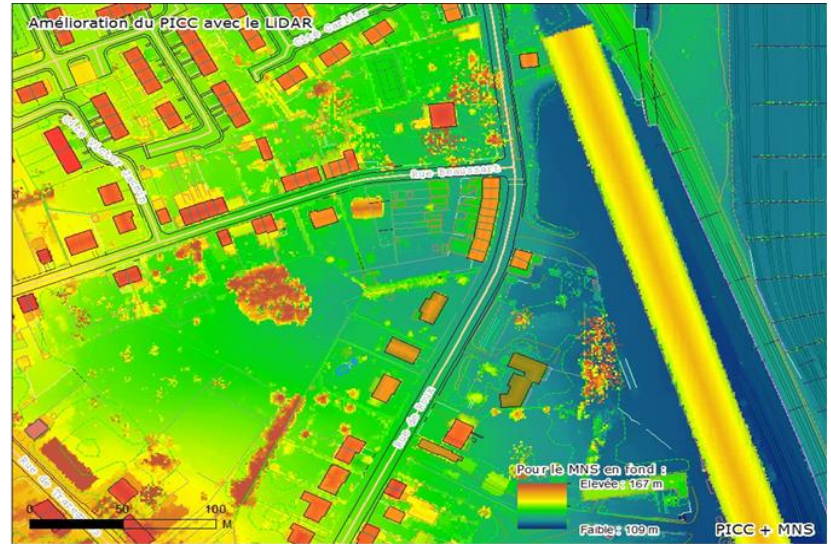


Airborne LiDAR applications

- **Mapping and Cartography** : Underlying features appear with LiDAR



Airborne LiDAR applications



Satellite data

- **Context:**

- Potentially a **complementary source of information** to periodically renew the orthoimage coverage.
- Possibility of **cross-boundary acquisition** => phenomenon are not limited at regional boundaries.
- High level of **accessibility** (“return visit”) and **flexibility**
With the Sentinel, some images should be available 3 hours after the acquisition, allowing almost time tracking / near real phenomenon.
- **Mosaic and archive images** with constant characteristics.
However for an annual regional coverage, we must accept a resolution less constant (angle of view, cloud problems, dates of acquisition...)

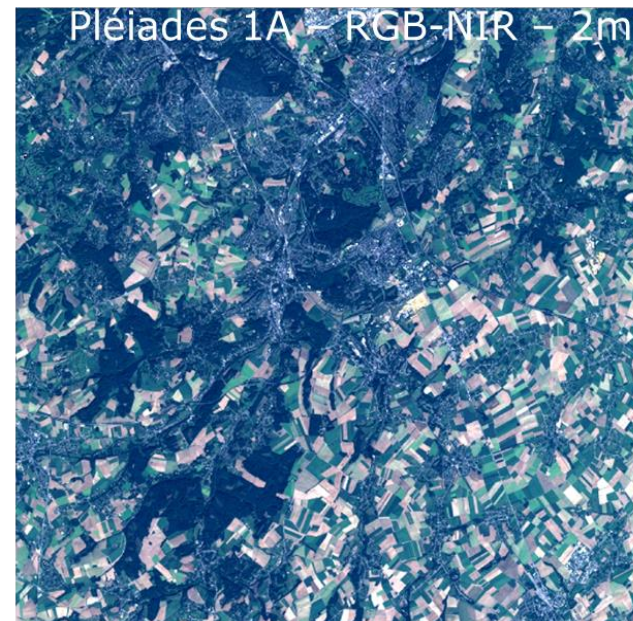
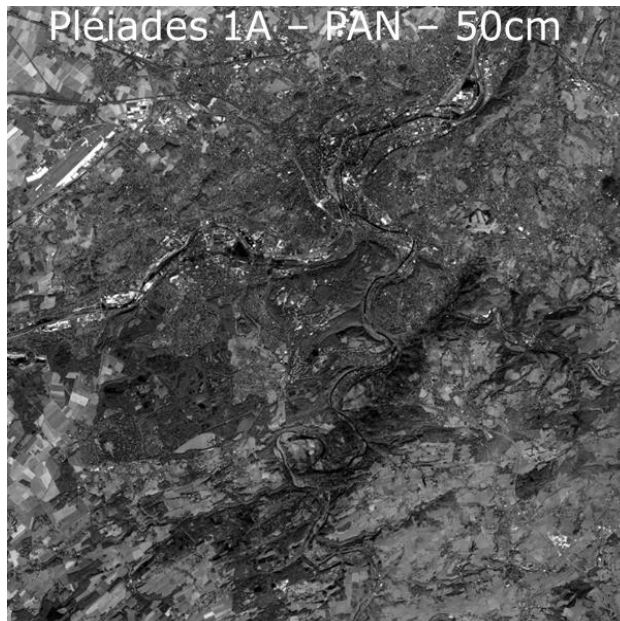


Satellite data

- **Pléiades coverage:**
 - Thanks to Belspo (ORFEO Programme & recent test of a complete national acquisition)
 - First results: Pléiades is well suited for specific target areas and the coverage of large areas is more sensible/uncertain



ORFEO Programme



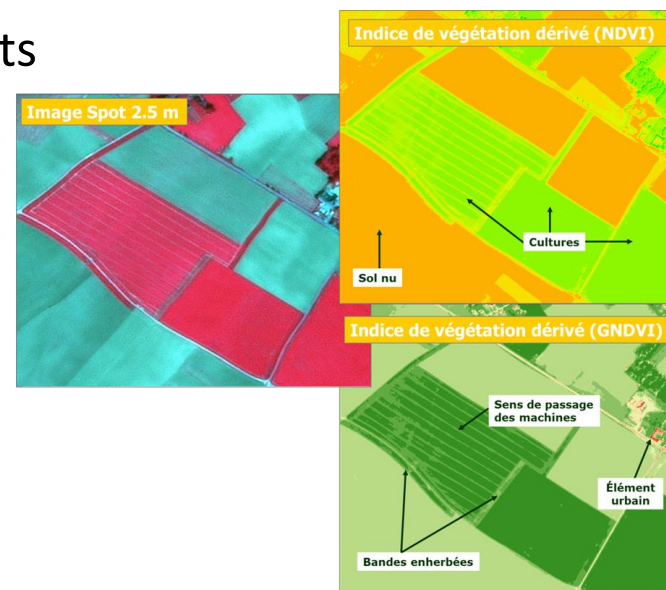
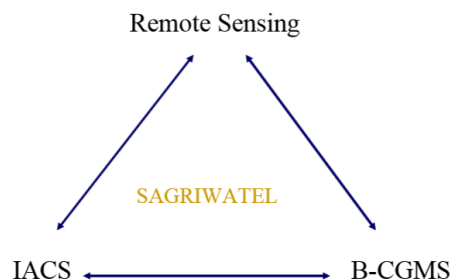
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Satellite data

- **EO data to support CAP:**
 - Control with Remote Sensing => operational
 - Performed using Satellite Remote Sensing.
 - **Very High Resolution (VHR)** Satellite Remote Sensing data are used for parcel measurements.
 - **High Resolution (HR)** SRS data are used to support the checks of land cover type or checks of Cross Compliance
- Research : B-CGMS & SAGRIWATEL Projects

SAGRIWATEL Components



Satellite data

- **New opportunities**
 - Possible broad use cases:
 - Detection / change detection
 - LC & LU
 - Crisis management / calamities
 - SPW = « End users » of satellite applications and services, in main case not a direct-end-user of satellite data.
 - Belspo initiatives and research programs
 - COPERNICUS & SPW-DGO6-SKYWIN
 - Awareness of users and policy makers on the utility of satellite remote sensing in public missions.
 - Belspo research programs
 - Strategic Plan for geomatics in Wallonia (PSGW 8/5/2014)  POGW

