Birth : 1973

Localization: Jambes (Namur) – Walloon Region

Company expert in aerial acquisition, restitution and navigation through:
  - staff: many experts (engineers, GIS specialists, earth & environmental sciences scientists, analysts, IT engineers,...)
  - material: 4 planes, 2 LiDAR sensors, 3 digital cameras, 1 temperature sensors

ISO 9001 certification
European projects

- **GMES Urban Services** (Subcontractor): Production of services related to urban land use/land cover; change detection; soil sealing and urban environment. ESA (prime INDRA Espacio) – 2003-2015


- **SABOCO** – Satellites in Border Cooperation. ESA (EOMD project) – 2005-2006

- **SAGACAP** – Satellites in a Generic Agricultural control approach. ESA (EOMD project) – 2005-2006
CONTEXT

• **Incentive:**
  
  Deforestation and forest degradation = second largest anthropogenic source of carbon emission in the atmosphere  
  (van der Werf et al., 2009)

  **REDD+** program adopted by the UNFCCC

• **EO4REDD:**
  
  - 2011 – 2013
  - Research & Development of innovative Earth Observation products
  - Study area in DRC
  - Project funded by the Walloon region
METHOD

• **Object-based semi-automatic change detection method:**
  - forest masks
  - deforestation and forest degradation
  - pilot area in DRC:
    - 3000 km²
    - 15 RapidEye images (5 m spatial resolution)
    - 3 years time series (2011-2012-2013)
  - Validation using
    - 14 QuickBird (2.4 m), 1 WorldView-2 (2 m), aerial images and ground truth measurements (6 plots [Walphot] & 30 plots [J-F. Bastin –ULB])

• **Allometric model based on ground measurements of individual trees & Aerial images stereo analysis**
  - to quantify carbon stock changes and emissions
RESULTS

• On the pilot area, between 2011 & 2012:

<table>
<thead>
<tr>
<th>Classes</th>
<th>Area (ha)</th>
<th>% of total area</th>
<th>% of forest area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>156.193</td>
<td>54.03</td>
<td></td>
</tr>
<tr>
<td>Non forest</td>
<td>103.673</td>
<td>35.86</td>
<td></td>
</tr>
<tr>
<td>Deforestation</td>
<td>438</td>
<td>0.15</td>
<td>0.28</td>
</tr>
<tr>
<td>Degradation*</td>
<td>276</td>
<td>0.10</td>
<td>0.18</td>
</tr>
<tr>
<td>No data (cloud cover)</td>
<td>28.491</td>
<td>9.86</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>289.072</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

* only for patches >0.075 ha

➤ 63% of the forest cover loss due to forest degradation
➤ Overall accuracy = 90.7%;
➤ Producer and user accuracy > 80% except for forest degradation (77%)

• Allometric model:

➤ Above Ground Biomass estimation using Height and Crown area ($R^2 = 0.7$) [UCL]
More information?

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