A Wildfire Risk Assessment for Belgium

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Background

Overview

Wildfires in Belgium

Wildfire Risk Assessment

The Wildfires of 2011

- More than 2000 ha of nature destroyed
  - les Hautes Fagnes → 1399 ha
  - de Kalmautse Heide → 500 ha
  - military domain in Meeuwen-Gruitrode → 360 ha
- Mainly NATURA 2000

National Wildfire Action Plan

- Both good and bad practices were experienced
  - need for a better coordination of wildfire responses
  - need for adapted cartography
- July 5, 2011: initiation of the National Wildfire Action Plan
- 5 themes:
  - risk analysis & cartography
  - materials
  - procedures and training
  - emergency planning
  - exercises
National Wildfire Action Plan

EU Legislation

  - preventive actions against fires should be undertaken in areas classified by Member States as medium or high fire risk.
  - in the case of preventive actions concerning pests and diseases, the risk of a relevant disaster occurrence must be supported by scientific evidence and acknowledged by scientific public organisations.
  - forest areas classified as medium to high forest fire risk according to the forest protection plan established by the Member States shall be eligible for support relating to forest fire prevention.

Data Collection

- Sources
  - newspaper articles: 1994 – 2015, online
  - newspaper articles: 1830 – 1950, archives of the Royal Library in Brussels
  - 756 wildfire interventions registered
    - Mainly human causes!
    - 273 useful spatial data points
      - GPS coordinates were retrieved
      - after 1994
      - but are these reliable?
  - Recommendations future data collection
    - register GPS coordinates and perimeter
    - correct labelling of wildfire interventions
Wildfires Between 1995-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>10</td>
</tr>
<tr>
<td>2000</td>
<td>20</td>
</tr>
<tr>
<td>2005</td>
<td>30</td>
</tr>
<tr>
<td>2010</td>
<td>40</td>
</tr>
<tr>
<td>2015</td>
<td>50</td>
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</tbody>
</table>

Spatial Wildfire Data

<table>
<thead>
<tr>
<th>Region</th>
<th>Province</th>
<th>Number of ignitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flanders</td>
<td>Antwerp</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Flemish Brabant</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>West-Flanders</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>East-Flanders</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Limburg</td>
<td>113</td>
</tr>
<tr>
<td>Wallonia</td>
<td>Hainaut</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Walloon Brabant</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Liège</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Luxembourg</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Namur</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Brussels</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>274</td>
</tr>
</tbody>
</table>
Overview

Background

Wildfires in Belgium

Wildfire Risk Assessment

Risk determinants

Wildfire risk

Ignition

Fuel moisture

Fuel Types

Stop & wind

Vulnerability

Ecological value

Socioeconomic value

Environmental services

Houses and human infrastructures

Belgian wildfire risk map

\[ P(I) = \frac{P(I) \times P(C|I)}{P(C)} \]

\[ P(I) = \frac{\text{average annual number of interventions}}{\text{total number of cells}} \]

\[ P(C|I) = \frac{\text{number of interventions on } C_i}{\text{total number of interventions}} \]

\[ P(C) = \frac{\text{area of } C_i}{\text{total area}} \]

- \( I \) is an intervention event
- \( C_i \) is a combination of land cover, soil, and land use
- Wildfire risk map \( \approx \) Intervention probability map

Risk classes

<table>
<thead>
<tr>
<th>Risk</th>
<th>Interval ( \times 10^6 )</th>
<th>Land cover</th>
<th>Land cover &amp; soil</th>
<th>Land cover, soil &amp; land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>( 0 - 0.00025 )</td>
<td>71.94</td>
<td>71.84</td>
<td>71.29</td>
</tr>
<tr>
<td>Intermediate</td>
<td>( 0.00025 - 0.12 )</td>
<td>15.14</td>
<td>23.05</td>
<td>21.86</td>
</tr>
<tr>
<td>High</td>
<td>( 0.12 - 0.4 )</td>
<td>10.27</td>
<td>4.52</td>
<td>6.36</td>
</tr>
<tr>
<td>Very high</td>
<td>( &gt; 0.4 )</td>
<td>0.76</td>
<td>0.71</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Average \( P \) \( \times 10^6 \) 0.28 0.31 0.45
Wildfire Risk Assessment

Risk map robustness

- How robust is the risk map?
- How important is the size of the data set?

Belgian wildfire risk map

Provincial breakdown

Towards a pan-European wildfire risk map