Forest ecosystem vulnerabilities to climate change in the Carpathians from the perspective of polish experts

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Information about Polish forests
National Forest Inventory

NFI in Poland 2005-2021

- Cycle length 5 years
- All forms of ownership
- Provides current data on the condition of forests.
- Monitors the direction of change that forests are undergoing over time.

The whole country is covered by a network of sample plots (4 x 4 km), integrated into the pan-European forest monitoring network.
## NFI Results 2016-2020

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Carpathian Region</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Area [ha]</td>
<td>815 269</td>
<td>9 258 843</td>
</tr>
<tr>
<td></td>
<td>(8,8 %)</td>
<td></td>
</tr>
<tr>
<td>Growing Stock [million m$^3$]</td>
<td>284,4</td>
<td>2 657,0</td>
</tr>
<tr>
<td></td>
<td>(10,8%)</td>
<td></td>
</tr>
<tr>
<td>Volume [m$^3$/ha]</td>
<td>351,2</td>
<td>287</td>
</tr>
<tr>
<td>Mean Age [years]</td>
<td>68</td>
<td>59</td>
</tr>
<tr>
<td>Dead wood [m$^3$/ha]</td>
<td>28,8</td>
<td>9,1</td>
</tr>
<tr>
<td>Current volume increment [m$^3$/ha/year]</td>
<td>11,46</td>
<td>9,29</td>
</tr>
<tr>
<td>Harvest</td>
<td>5,73</td>
<td>6,1</td>
</tr>
</tbody>
</table>

### Species composition by dominant species [%]

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Coniferous – 55,3 (Fir 29,7) Broadleaved – 44,7 (Beech – 27,5)</td>
<td>Coniferous – 68,2 (Pine 58,1) Broadleaved – 31,8 (Oak – 8,1)</td>
</tr>
</tbody>
</table>
Special Session and Workshop on forest ecosystem vulnerabilities to climate change in the Carpathians

Dead wood by natural forest divisions m³/ha

Ownership forms of forest

Carpathian region

Poland

Ownership forms of forest
BACCARA Publications


Poland: Radziejowa (Beskid Sądecki), Pilsko (Beskid Żywiecki)

Altitudinal transects – gradient to simulate climatic variability (change)

Publications:


Forum Carpaticum 2010

Forum Carpaticum 2012

Tackling climate change: the contribution of forest scientific knowledge

IUFRO 7.03.10, Palanga (Lithuania) 2012
Detection and definition of the altitudinal distribution of 2 bark beetle species not recorded earlier in the Tatra Mts. Altitudinal transects 1000-1400 m a.s.l.


The upward spreading of the studied insects as a possible effect of climate change and the resulting environmental conditions favourable for those organisms.

Example of forest management under disaster pressure

Programme for the Beskydy Mountains (2003) - support for spruce forest disaster management in the Beskydy Mountains and their reconstruction (State Forests and Forestry Faculty in Cracow)
COST Action CA15226 CLIMO, Oct 2016 – Oct 2020, brings together international scientists, experts and young scholars to develop Climate-Smart Forestry (CSF) concept for European mountain regions. The Management Committee comprises of representatives from 28 COST Member Countries, as well as Observers from 5 Near Neighbour Countries (NNC) and 5 International Partner Countries (IPC).

1. Definition of Climate-Smart Forestry and identification of “smartness” criteria for the European mountain forests
2. Creation of an European Smart Forest Network (ESFONET)
3. Analysis of the requirements for the development of a cybernetic web of experimental structures
4. Development of innovative schemes of payment for environmental services (PES)
5. Dissemination of research results to the general public and to stakeholders

https://www.youtube.com/watch?v=qouZ-AUavlQ
Summary

the most pressing vulnerabilities of forests and their ecosystem services to climate change

• A new situation for which owners and managers are not fully prepared (pests, droughts, floods, changing expectations of forests). Monitoring and trends observed are important scientific studies

• From Baccara project to Climo COST Action

Which responses to identified climate impacts and risks are already being implemented?

• Programme for the Beskydy Mountains

What are the main challenges, but also opportunities, when dealing with current and future climate variability in forest ecosystems?

• Permanent forest monitoring need, exchange of knowledge science - practice, education of forest managers. Involving local communities in discussions