

Tools for enhancing motivation in teaching climate change and impacts for students in forest- and environmental engineering

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Climate change is observed to have severe impacts on forest ecosystems. Ongoing research projects are dealing with the complex analysis of the causes of the health status decline and mortality of the vulnerable tree species. In the Carpathian Basin, recurrent long lasting drought periods and heatwaves of the last decades initiated the sequence of abiotic and biotic impacts in the beech and oak forests. Threatening extreme events are very likely to occur more frequent under changing climate conditions until the end of the 21st century. Therefore adaptation strategies and renewed regulations of the tree species selection are necessary.

Learning material of forest education needs to be continuously updated with the new aspects and results of recent research and forest management planning. Therefore ideas and tools have been developed for teaching climate change impacts for students in forest- and environmental engineering. Using examples from world sport championships (e.g. losers and winners of climate change) these tools are applied to communicate the basic research questions in an easily understandable way as well as to motivate students and raise their awareness for the complex processes of forest – climate interactions.

By the application of the developed examples for motivation, the key competences and learning outcomes can be the following:

- students get an insight into the observed and projected tendencies of climate extremes;
- they get an impression on the complexity of the climate change related damage chains;
- they will be able to identify the climatic drivers of forest decline and mortality;
- with the skill of critical thinking they will be able to evaluate the ecological role of forests that are already affected and that could be affected by the consequences of changing climate conditions;
- they recognize the importance and urgency of the appropriate decisions in forestry and nature conservation.

Keywords: climate change impacts, forest education, teaching tools for motivation

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