

## CHANGING VISUAL VALUE OF DECIDUOUS SPECIES IN THE CLIMATE CHANGE

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### ABSTRACT

The article deals with the changing visual value of deciduous species. Due to climate change, the characteristics and attributes of plants' growing area (temperature, precipitation, sunshine duration, strength of sunlight, etc.) have changed. Through this shift, foliage of deciduous trees changes the colour in the autumn season in a different rhythm and intensity. This effect of the climate change hasn't been examined in terms of landscape design yet.

In the first part of the research, we collect available resources of satellite images from past and present years, and we choose the one which is optimal in terms of the following attributes: temporal resolution, spatial resolution, and available bands. We collect satellite images referring to a chosen location. In this research, we examine hybrid poplars (*Populus* hybrids), because they can be found in bigger stands, they have proper autumn leaf colour, and the design value of the species is relevant.

We propose a novel method of image processing to evaluate the colour change of the stand using an index number. The index shows the leaf colour's relation to the colour realms. Based on statistics, we set up a phenological model. By entering climate data, the model is able to show when the yellowing starts and how intensive it is. Based on future climate models, we make a prognosis of the change of examined stand's visual value. The results might affect the future use of plant species in landscape architecture.

**Keywords:** autumn leaf colour, climate change, colour evaluation, hybrid poplars, image processing, phenological model, visual value.

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